

REFERENCE MANUAL 41: WILDERNESS STEWARDSHIP

NPS Wilderness Character Monitoring Technical Guide

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Recommendation and Approval for Inclusion in Reference Manual 41

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Introduction

Purpose of the National Park Service Wilderness Character Monitoring Technical Guide

The purpose of this Guide is to provide national guidance on how to monitor and assess trends in wilderness character for National Park Service (NPS) wilderness areas. This Guide supports the NPS policy requirement that every wilderness park “will conduct a wilderness character assessment, which includes identifying what should be measured, establishing baseline data, and conducting ongoing monitoring of trends... Once a baseline is established, tracking change and reporting on the trend in wilderness character should generally occur every five years” (*Director’s Order 41, Section 6.2 Wilderness Character*).

This Guide applies to all areas in the NPS that have a statutory mandate and/or policy requirement to preserve the wilderness character. See the “Wilderness in the NPS” section to learn about NPS categories of wilderness.

Primary users of this Guide include wilderness managers, interdisciplinary park program managers, and other field-level park staff who implement wilderness character monitoring (WCM). National and regional NPS programs and partners that support parks in monitoring efforts are also addressed here.

How This Guide is Organized

This Guide has three main parts¹:

1. Foundational information: This section describes overarching WCM information for the interagency National Wilderness Preservation System, the primary purpose for WCM in the NPS, the NPS national framework for developing baseline assessments, the scope of NPS lands to which WCM applies, and NPS roles and responsibilities for implementing WCM.
2. WCM by quality: This section describes important information about each tangible quality of wilderness character and its related WCM framework components. Example measures and measure idea templates are listed for each quality.
3. Appendices: The appendices provide relevant background and context for WCM to supplement information in this Guide.

To emphasize content that readers may want to revisit, three icons are used throughout this Guide:



List of steps or concepts for reference.



Availability of a document template for use.



Ideas or questions to consider before advancing.

¹ Many of the links referenced in this Guide connect to documents that only DOI employees can view.

Foundational Information

What is Wilderness Character Monitoring and Why Do It?

The statutory mandate of the Wilderness Act is to preserve wilderness character. This affirmative legal obligation applies to all designated wilderness areas across the entire National Wilderness Preservation System (NWPS), including all NPS wilderness areas. This is affirmed by NPS Management Policies 2006, Chapter 6 which states that management of these areas will “preserve their wilderness character, and... the purpose of wilderness in the national parks includes preservation of wilderness character...”

To ensure that wilderness character is preserved, it must first be defined. The Wilderness Act does not define wilderness character. As such, a federal interagency wilderness team collaborated to define wilderness character based on references and language from the Wilderness Act (Landres et al. 2015):

Wilderness character is a holistic concept based on the interaction of (1) biophysical environments primarily free from modern human manipulation and impact, (2) personal experiences in natural environments relatively free from the encumbrances and signs of modern society, and (3) symbolic meanings of humility, restraint, and interdependence that inspire human connection with nature. Taken together, these tangible and intangible values define wilderness character and distinguish wilderness from all other lands.

Given the breadth of this holistic concept, WCM focuses on a specific subset of tangible qualities of wilderness character that are derived from the Definition of Wilderness, Section 2(c) of the Wilderness Act:

1. Natural Quality
2. Untrammeled Quality
3. Undeveloped Quality
4. Solitude or Primitive and Unconfined Recreation Quality
5. Other Features of Value Quality

Through the lens of the five tangible qualities, WCM equips managers with a framework to consider and steward changes that meaningfully affect the condition and trend of wilderness character. Parks can use WCM information to assess the effects of past management decisions on wilderness character and to inform decisions about future actions. WCM is distinct from other forms of monitoring because monitoring results must be translated into a conclusion of impact on wilderness character. This translation requires sound professional judgment and thoughtful insight by managers. Subjectivity is a known element of WCM, as impacts to wilderness character are nuanced, complex, highly variable, and necessitate professional judgment in translating observed changes into management implications for wilderness character. Simultaneously, the WCM framework is designed to counterbalance aspects of this subjectivity by making processes and analyses more transparent and consistent.

Monitoring by itself does not provide guidance for what to do if trends in wilderness character are declining; instead, monitoring can signal the need for follow-up actions or decisions and can

clarify the tradeoffs associated with actions or decisions. The results from WCM can also highlight qualities or aspects of wilderness stewardship that are changing in condition and may need to be addressed by park management. Monitoring informs and helps improve wilderness stewardship by encouraging management accountability for the central mandate of the Wilderness Act - to preserve the wilderness character of every wilderness area for present and future generations.


WILDERNESS CHARACTER MONITORING IN THE NATIONAL WILDERNESS PRESERVATION SYSTEM

Interagency and Agency-Specific Wilderness Character Monitoring Guidance

The NWPS includes wilderness areas managed by the NPS, Bureau of Land Management (BLM), US Fish and Wildlife Service (USFWS), and US Forest Service (USFS). This Guide is related to, and builds on, existing WCM guidance for the NWPS and the NPS.

[Keeping It Wild 2: An Updated Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System](#) (KIW2) (2015)

KIW2 is the interagency monitoring strategy and framework of qualities, monitoring questions, and indicators used in WCM. KIW2 updated the interagency framework of WCM and replaced the original interagency *Keeping It Wild* (2008). KIW2 was endorsed in 2016 by the Interagency Wilderness Policy Council and subsequently approved for inclusion in *NPS Reference Manual 41: Wilderness Stewardship*. The WCM framework defined in KIW2 provides the organizational structure of this Guide. However, the NPS has made some agency-specific modifications to this framework for NPS wilderness areas.

 See each quality's chapter and Appendix B in this Guide for additional details on modifications to guidance described in KIW2. These modifications reflect lessons learned since KIW2's release in 2016 regarding what is most useful to parks for WCM purposes. *In cases where guidance differs between KIW2 and this Guide, NPS users should refer to this Guide.*

KIW2 includes extensive descriptions of important WCM concepts. For brevity, these concepts are not reiterated in this Guide. Instead, they are incorporated by reference (Table 1). This approach in no way diminishes the importance or relevance of these concepts; they are foundational to understanding the conceptual framework of WCM.

Table 1. Key interagency WCM concepts described in *Keeping It Wild 2*

Interagency WCM Concept	<i>Keeping It Wild 2</i> Location
Assessing trend	Pages 17-19, 24-29
Shared management responsibility with another agency (BLM, USFWS, USFS)	Page 23
Detailed description of the five tangible qualities of wilderness character	Pages 33-60
Detailed description of hierarchical framework <i>This Guide does offer flexibility for some components of the KIW2 'required' WCM framework.</i>	Pages 4,17-18
What is a trammeling action?	Pages 101-106

[*Keeping It Wild in the NPS: A User Guide to Integrate Wilderness Character into Park Planning, Management, and Monitoring* \(2014\)](#)

Keeping It Wild in the NPS is agency-specific guidance on how to integrate wilderness character into park management. This includes introducing integral WCM-related items like the wilderness character building blocks (including a wilderness character narrative and baseline assessment). Because *Keeping it Wild in the NPS* was developed a year prior to KIW2, it does not reflect the updated and revised WCM framework from KIW2 (and relevant updates in this Guide), but its guidance for integrating wilderness character into overall park planning, management, and monitoring is still relevant.

[*Survey Protocol Framework for Wilderness Character Monitoring on National Wildlife Refuges* \(2018\)](#)

[*Measuring Attributes of Wilderness Character: Bureau of Land Management Implementation Guide* \(2020\)](#)

[*US Forest Service Wilderness Character Monitoring Technical Guide* \(2020\)](#)

These three documents are the functional equivalents of this Guide for the USFWS, BLM, and USFS. Portions of this Guide are modified from these documents to promote interagency consistency where feasible.

WILDERNESS CHARACTER MONITORING IN THE NATIONAL PARK SERVICE

Wilderness in the NPS

Over 44 million acres of NPS lands are designated as wilderness by Congress. An additional 26+ million acres of lands are eligible, proposed, recommended, and potential wilderness. In total, over 80 percent of the entire National Park System is managed as wilderness.

The mandate to preserve wilderness character applies to all categories of wilderness per NPS policy. [NPS Management Policies 2006, Chapter 6](#) states “[f]or the purposes of applying these policies, the term ‘wilderness’ will include the categories of eligible, study, proposed, recommended and designated wilderness.” Accordingly, WCM will be conducted for all NPS categories of wilderness.

NPS Primary Purpose of Wilderness Character Monitoring

NPS WCM aims to principally support park-specific wilderness character needs. The primary purpose of WCM in the NPS is to help parks consider and steward changes that meaningfully sustain or improve the condition and trend of the park’s wilderness character. This emphasis on local relevance means that the strength of servicewide WCM functions (i.e., national condition and trend assessments for wilderness character) may be diminished to achieve this place-based purpose. This tradeoff is both recognized and accepted.

NPS Wilderness Character Monitoring Definitions

The following terms are essential to the NPS WCM process. These definitions are NPS-specific and may differ from another agency’s interpretation of the term.

- *Baseline measure value* = the reported value (quantitative or qualitative) for a measure from the ‘baseline measure year’. This value is the reference/comparison point to assess the ‘trend’ in a specific measure over time, where the current ‘reported measure value’ is compared to the baseline measure value.
- *Baseline measure year* = the earliest year data is available to report a ‘baseline measure value’ for an individual measure.
- *Change* = an informal comparison of the state of wilderness character for a ‘measure,’ ‘indicator,’ ‘monitoring question,’ ‘wilderness character quality,’ or overall wilderness character. Change is determined by comparing the ‘reported measure value’ to the ‘baseline measure value’ for measures with fewer than five data points informing the current ‘reported measure value.’ Like ‘trend’, interpreting change should be informed by the measure’s corresponding ‘threshold for meaningful change’ to help interpret the comparison. Recognizing a ‘change’ in condition prompts managers to consider the cause and effects of the change while awaiting enough data points to make official ‘trend’ conclusions.



WCM Terminology

- Baseline measure value
- Baseline measure year
- Change
- Indicator
- Measure
- Measure components
- Modern
- Monitoring
- Monitoring question
- Park
- Reported measure value
- Threshold for meaningful change
- Trend
- Wilderness character baseline assessment
- Wilderness Character Building Blocks Report

- *Indicator* = distinct and important components under each ‘monitoring question’ within the ‘WCM framework’. There is at least one standardized indicator for every ‘monitoring question’. Each indicator selected will have at least one corresponding ‘measure.’
- *Measure* = specific elements under each ‘indicator’ within the ‘WCM framework’. Each measure yields data that is collected to identify condition and assess ‘trend’ in the ‘indicator’. Measures are selected by the park.
- *Measure components* = Individual components of a ‘measure’ that provide the detailed parameters to successfully implement and monitor the ‘measure.’ Each selected ‘measure’ must address and document all measure components in the ‘Wilderness Character Building Blocks Report’. Measure components include measure title, context and relevance, definitions, protocol, data sources, data adequacy, frequency, threshold for meaningful change, and caveats and cautions.
- *Modern* = the time since the area was first managed to preserve wilderness character. For most parks, this will be the year a wilderness eligibility assessment, or equivalent documentation, was completed.² The use of modern helps managers determine the scope of time to consider when assessing impacts to wilderness character and does not negate the longstanding and ongoing relationships shared between people and lands currently managed as wilderness.
- *(Long-term) Monitoring* = the recurring monitoring of measures according to protocol described in a park’s ‘Wilderness Character Building Blocks Report’ (and subsequent WCM framework modification protocol). Monitoring intervals will depend on measure-specific protocol described in the report, occurring every five years at minimum.
- *Monitoring question* = questions that frame essential components of each tangible ‘wilderness character quality’ within the ‘WCM framework.’ Each standardized monitoring question has multiple ‘indicators.’
- *Park* = local NPS unit responsible for managing a specific wilderness area.
- *Reported measure value* = the reported value for a measure that serves as a comparison to the ‘baseline measure value’ to assess ‘trend’ in the measure. This value is reported every five years and may be a composite of several years of data, depending on the measure’s protocol.
- *Threshold for meaningful change* = a quantitative and/or qualitative set of parameters that interpret change in the current ‘reported measure value’ compared to the ‘baseline measure value’. This comparison distinguishes minor/reasonable change (within identified thresholds) from meaningful change (exceeding the identified threshold, which can be positive or negative). The outcome of this change is used to determine ‘trend’.
- *Trend* = a formal comparative assessment of the state of wilderness character for a ‘measure,’ ‘indicator,’ ‘monitoring question,’ ‘wilderness character quality,’ or overall wilderness character of the area. Trend is officially determined by comparing the current

² This definition of modern considers the social, cultural, and ecological conditions that precipitated the creation of the Wilderness Act. Concerns about the pace of industrialization (i.e., ‘expanding settlement and growing mechanization’) inspired wilderness supporters to consider ways of protecting public lands from these ‘modern’ impacts. The definition of ‘modern’ may be modified if agreement is reached by the park’s interdisciplinary wilderness team, including representation from cultural resources and facilities. A thoughtful rationale for a modified definition must be documented in the Wilderness Character Building Blocks Report.

'reported measure value' to the 'baseline measure value' if the current 'reported measure value' includes a minimum of five data points. Trend references the measure's corresponding 'threshold for meaningful change' to help interpret the comparison and conclude if the trend is improving, stable, or declining. Absent the availability of five data points, 'change' (rather than trend) between current and baseline measure values can still be discussed and documented.

- *Wilderness character baseline assessment* = the comprehensive representation of all required 'WCM framework' components applicable to a specific park that establishes a reference point for future 'trend' comparisons. This assessment is complete when all selected measures have an identified 'baseline measure year' and 'baseline measure value'.
- *Wilderness Character Building Blocks Report* = a document that includes both the wilderness basics and 'wilderness character baseline assessment.' For the wilderness character baseline assessment building block, the report documents the comprehensive 'WCM framework', including all selected 'measures' and related protocols, and 'baseline measure values' and 'baseline measure years'. This report should note the 'WCM baseline year' and serves as a reference for all 'monitoring'.
- *WCM baseline year* = the first year that data are reported for all measures in a park's 'WCM framework'. At a minimum, this means that at least one measure is identified for every required indicator and each of these measures has a 'baseline measure value'.
- *WCM framework* = the combination of all monitoring components for wilderness character, including 'wilderness character qualities', 'monitoring questions', 'indicators', and 'measures.'
- *Wilderness character quality* = the primary tangible attribute(s) of wilderness character that links directly to the statutory language of the Wilderness Act. Commonly referred to as "the qualities", the same set of five qualities applies to all federal wilderness areas: Natural, Untrammeled, Undeveloped, Solitude or Primitive and Unconfined Recreation, and Other Features of Value. Within the 'WCM framework,' each quality has at least one corresponding 'monitoring question.'

National Framework for WCM

The national framework for WCM in the NPS is based on the following concepts:

- The NPS uses a modified version of the KIW2 framework of wilderness character qualities, monitoring questions, and indicators to promote interagency consistency while providing for park-specific flexibility (Table 2).
- Each selected indicator must have at least one corresponding measure. For the NPS, not all indicators are required. The decision to omit an optional indicator(s) must be paired with a thoughtful and documented rationale in the Wilderness Character Building Blocks Report.
 1. Optional indicator: 'Actions not authorized by the federal land manager that intentionally manipulate the biophysical environment' (Untrammeled Quality)
 2. Optional indicator: 'Presence of inholdings' (Undeveloped Quality)
 3. Optional indicator: 'Remoteness from sights and sounds of human activity outside of wilderness' (Solitude or Primitive and Unconfined Recreation Quality)

4. At least two measures for the Natural Quality must be selected (addressing a minimum of two of the four indicators for this quality).
 5. At least one measure for the Other Features of Value Quality must be selected (addressing a minimum of one of the two indicators for this quality).
- Each NPS wilderness area has the flexibility to choose measures for the selected indicators following the requirements above. No specific measures are required. For any measure selected, thorough documentation of all measure components is critical.
 - In general, measures selected for WCM should be:
 - *Useful*: Select locally relevant measures that show how conditions are changing over time and that are directly useful to stewardship decisions.
 - *Simple*: Select the fewest measures that will credibly track change in the indicator.
 - *Sustainable*: Select measures that can be consistently monitored over time - WCM is a long-term commitment.³

Table 2. Wilderness character qualities, monitoring questions, and indicators for the NPS

Quality	Monitoring Question	Indicator
Untrammeled	What are the trends in actions that intentionally control or manipulate “the earth and its community of life” inside wilderness?	Required: Actions authorized by the federal land manager that intentionally manipulate the biophysical environment
		Optional: Actions not authorized by the federal land manager that intentionally manipulate the biophysical environment
Natural	What are the trends in the natural environment from human-caused change?	Required - Select at least two of the following: Plants Animals Air and water Ecological processes
Undeveloped	What are the trends in non-recreational physical development?	Required: Presence of non-recreational structures, installations, and developments

³ Sustainability is not a static concept. Future modifications to measures may be needed, but measures should be selected after first considering the anticipated long-term implications of selecting the measure. See the “Modifying the WCM Framework” section for more information.

		Optional: Presence of inholdings
	What are the trends in mechanization?	Required: Use of motor vehicles, motorized equipment, or mechanical transport
Solitude or Primitive and Unconfined Recreation	What are the trends in outstanding opportunities for solitude?	Required: Remoteness from sights and sounds of human activity inside wilderness
		Optional: Remoteness from sights and sounds of human activity outside wilderness
	What are the trends in outstanding opportunities for primitive and unconfined recreation?	Required: Facilities that decrease self-reliant recreation
		Required: Management restrictions on visitor behavior
Other Features of Value	What are the trends in the unique features that are tangible and integral to wilderness character?	Required - Select at least one of the following: Deterioration or Loss of Integral Cultural Features Deterioration or Loss of Other Integral Site-Specific Features of Value

NPS Example Measures and Measure Idea Templates

This Guide lists and describes at least one example measure for every required and optional indicator in the NPS WCM framework. Additionally, measure idea templates are offered for measures used by some parks. Use of example measures and/or measure idea templates is not required.

 [Example Measures](#)
 [Measure Idea Templates](#)

[Example measures](#) give users of this Guide a sense of how a specific park interpreted and implemented the intent of a specific indicator. Considering example measures can prompt discussions that yield more meaningful measure creation as parks proceed through the WCM process. Example measures are not required and not intended for wide-spread use. If a park is inspired by an example measure, substantial place-based modifications may be necessary, as measure components like thresholds for meaningful change and frequency must reflect local context.

[Measure idea templates](#) provide a modifiable structure for parks interested in using one or more commonly used measures. The templates were co-created by NPS subject matter experts and will be updated as needed.

The example measures and measure idea templates do not preclude a park from using other measures (from existing monitoring efforts or newly created for WCM-specific purposes) to locally address wilderness character. Remember, the primary purpose of WCM is to serve park-identified wilderness stewardship needs. This purpose means all measures need to be locally relevant and aid parks in understanding the state of wilderness character via specific components of this large and complex concept.

THE WILDERNESS CHARACTER MONITORING PROCESS

Completing a wilderness character baseline assessment

There are five steps that should be taken by all parks to complete a wilderness character baseline assessment.



Wilderness Character Baseline Assessment in Five Steps

1. Ensure the wilderness boundary is accurate and available in GIS.
2. Holistically consider the WCM framework through the lens of park-identified wilderness stewardship priorities.
3. Select measures, including identification of all measure components.
4. Confirm availability of measure data.
5. Compile and document the wilderness character baseline assessment

Step 1: Ensure the wilderness boundary is accurate and available in GIS

Each wilderness area must have current and accurate geospatial boundary data to successfully implement WCM. This GIS boundary information is a foundation for conducting more accurate analysis and monitoring. Review the [NPS Wilderness GIS Boundary Creation/Verification Guidance](#) to learn more.

Step 2: Holistically consider the WCM framework through the lens of park-identified wilderness stewardship priorities

The wilderness character baseline assessment and monitoring are only as useful as the intentionality that goes into identifying WCM details. Before diving into measure selection details, parks are encouraged to take a step back and holistically consider the WCM framework through the lens of park-identified wilderness stewardship priorities. Holistic consideration includes involving perspectives from different park disciplines and initiating discussions with ample time to discuss, reflect, and refine.



With the WCM framework of qualities, monitoring questions, and indicators in hand, discussions can begin. Questions to guide these discussions include:

- Are there existing measures with available data that could provide important information for the support of park wilderness stewardship, and thus should be considered in WCM measure selection (e.g., desired conditions and thresholds associated with a Wilderness Stewardship Plan)?
- What is considered the biggest threat(s) to wilderness character in terms of the X indicator for the park?
- What are potential negative aspects of missing or ignoring changes in this threat(s)?
- Is there an aspect(s) of wilderness character that is especially well preserved/protected right now? Why is this occurring? Is this something that needs to be monitored into the future to ensure its continued preservation/protection?
- Is it worth using two or more different measures to holistically capture aspects of the X indicator?
- Are there other aspects related to the X indicator that should also be considered?
- What data are or will be available to support each potential measure? Data includes quantitative and qualitative sources.
- How should existing data and established protocol (versus creating something new that is tailored to WCM) influence measure selection?
- What process will be used to develop and justify thresholds for meaningful change in tandem with measure selection?
- How sensitive should the threshold for meaningful change be? Should it serve as a red flag for coming change, or should it convey change that has clearly happened already?
- How might resulting trend conclusions (based on the measure and threshold for meaningful change) potentially inform management or policy decisions?

Whether using these questions or others to think through the process of identifying WCM-wilderness stewardship priorities, it is important that threats to wilderness character, as well as current wilderness character preservation successes (that the park wants to continue or expand on in the future), are identified prior to measure selection. This ensures time invested in WCM is well-spent and yields helpful information for subsequent park planning, management, and operations.

During this step, parks should also be aware of the individual measure components that inform each measure. Notably, measures and thresholds for meaningful change should be simultaneously identified. A threshold for meaningful change identifies what amount of change in a measure qualifies as meaningful relative to wilderness character. Retroactively assigning a threshold to an already selected measure may fail to identify change that meaningfully affects wilderness character. Exploring measure options in tandem with thresholds for meaningful change offers insight specific to park-identified wilderness stewardship priorities. For parks with Wilderness Stewardship Plans, this includes considering how potential WCM thresholds for meaningful change relate to plan components like thresholds and desired conditions. See the “How WCM Relates to Wilderness Stewardship Planning, Compliance, and Operations” section for more details.

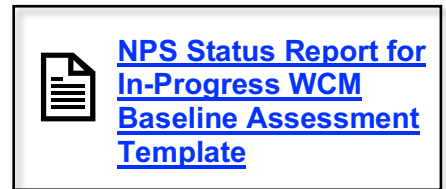
Step 3: Select measures, including identification of all applicable measure components

Once the WCM framework and park-specific wilderness stewardship priorities are holistically considered, parks can select measures and identify details for all applicable measure components. See the "Components Described for Each Measure" section for more information. Remember, at least one measure must be identified for every *required* indicator, per the NPS national WCM requirements.

Step 4: Confirm availability of measure data

If adequate data is available for all selected measures, proceed to Step 5.

In some cases, park-identified wilderness stewardship priorities may not have relevant data immediately available for use in WCM. This is not a dead end for engaging in the WCM process! Parks with WCM data gaps should use the [NPS Status Report for In-Progress WCM Baseline Assessment Template](#) to document their progress and help keep the WCM process moving forward.



Step 5: Compile and document the wilderness character baseline assessment

The wilderness character baseline assessment is complete when there is a baseline measure value for each selected measure (and there is at least one measure for each required indicator). Once the wilderness character baseline assessment is complete, a Wilderness Character Building Blocks Report should be developed. This report documents a park's WCM framework, measures selected, measure components, and baseline measure years and values. Some parks find it helpful to begin drafting the report in tandem with Step 2, where all WCM framework details are documented in-real time rather than writing the report afterwards. Parks are encouraged to use the [Wilderness Character Building Blocks Report Template](#)⁴ for the final report⁵.



When a draft Wilderness Character Building Blocks Report is complete, parks will submit the draft to the NPS WASO Wilderness Stewardship Division for review (wilderness_stewardship@nps.gov). Additional report reviewers are optional, including the NPS Regional Wilderness Coordinator.

After the above reviews are complete, the park superintendent (or their designee) should approve and sign the final Wilderness Character Building Blocks Report. This signature validates the park's wilderness character baseline assessment and indicates commitment to

⁴ The wilderness character building blocks include 1) the Wilderness Basics, 2) Wilderness Character Baseline Assessment, and 3) Integrating Wilderness Character into Park Operations (not typically documented in the Wilderness Character Building Blocks Report). Parks are encouraged to develop the Wilderness Basics prior to initiating a baseline assessment. Learn more via the [Wilderness Character Building Blocks Resource Brief](#).

⁵ Optional publication of the Wilderness Character Building Blocks Report through the [NPS Natural Resource Report Series](#) (NRR) is available.

ongoing WCM. Once signed, parks should provide a digital copy (or link) of the final report to the NPS WASO Wilderness Stewardship Division.

In addition to the Wilderness Character Building Blocks Report, parks will need to enter their wilderness character baseline assessment data into the WCM national database.

Process for using the WCM national database:

1. Complete the wilderness character baseline assessment and corresponding Wilderness Character Building Blocks Report.
2. Identify the park's data steward for data entry.
3. Email the NPS WASO Wilderness Stewardship Division (wilderness_stewardship@nps.gov) to set-up a database account.
4. Enter wilderness character baseline assessment data in database.
5. Enter measure values for each five-year monitoring interval into the database. Data that informs five-year reporting data (i.e., annual measure values) for each measure should be logged and maintained on a park-managed database (or other record) at the intervals defined in the protocol, as data can only be entered at five-year intervals in the national database.

Components Described for Each Measure

Every measure used in WCM must describe the following components. It is important to ensure appropriate documentation is provided for each section.

Measure title. This is the title of the measure. Titles should be succinct while providing enough detail to convey the purpose of the measure.

Context and relevance. This section explains why the measure is relevant and gives background information that helps inform the reader of context that ultimately led to the measure's selection.

Definitions. This section defines terms relevant to understanding and monitoring the measure. When used in a WCM context, some terms have specific meanings which may not correspond to how managers otherwise use these terms (such as "trammeling," "installation", and "development").

Protocol. This section provides step-by-step instructions on how to implement and analyze the measure, outlining the steps needed to arrive at a final reported measure value.⁶ Protocol should provide clear, repeatable instructions for monitoring. Modifications to protocol (that may

⁶ Protocol should reflect park-specific distinctions that make the measure both useful and feasible. For example, parks may use a representative sample instead of a comprehensive inventory for count-based measures. Other measures may outline a multistage approach, where one measure is used until presence as a threshold is passed (e.g., presence of XX detected where previously XX did not exist), followed by a shift to a measure accounting for potential and observed impacts after presence has been confirmed.



Measure Components

- Measure title
- Context and relevance
- Definitions
- Protocol
- Data sources
- Data adequacy
- Frequency
- Threshold for meaningful change
- Caveats and cautions

emerge over time) should also be documented here, noting the full sequence of original to modified protocol, so as to give the reader context for potentially observed discrepancies. See the 'Modifying the WCM Framework' section of this Guide for more details.

Data sources. This section identifies the source(s) and location(s) of the data used for WCM. Data can include qualitative, quantitative, and mixed methodology sources. To be clear, well documented professional judgment and other qualitatively described subject matter expertise is an appropriate data source for WCM. For all data sources, details for locating data should be documented, including links to online data sources, pathways for digital documents located on network drives, and descriptions of where to find hard-copy files.

Data adequacy. This section addresses the reliability of the data to assess trends in the measure. It encompasses both data quality and data quantity. Data adequacy is an assessment of the reliability and confidence in the data used for each measure -- determined by assessing data quantity and quality. Each measure describes both data quantity and quality, using the assessment metrics below, and concludes with an overall data adequacy "rating."

Data quantity refers to the level of confidence that all necessary and appropriate data records have been gathered. In determining the best available information for a park, "available" refers to information that currently exists in a useful form, and that does not require further collection, modification, or validation. If the available data are insufficient in quantity, they may still be considered the best available information for the park. Data quantity is described by the following three categories, determined by the park:

1. Complete—This category indicates a high degree of confidence that all necessary and appropriate data records have been gathered.
2. Partial—This category indicates a medium degree of confidence that all necessary and appropriate data records have been gathered. Some data are available but are generally considered incomplete.
3. Insufficient—This category indicates a low degree of confidence that all necessary and appropriate records have been gathered. Few or no data records are available.

Data quality refers to the level of confidence about the data source and whether the data are of sufficient quality to reliably identify trends in the measure. Data quality is assessed by the data's accuracy (the degree to which the data express the true condition of the measure and not other sources of variation affecting the measure), reliability (the degree to which the data follow established or well-developed protocols), and relevance (the degree to which the data are spatially and temporally appropriate for the measure). In general, the highest quality data will be considered the best available information. Remember, WCM data can be quantitative, qualitative, or mixed methodology. Data quality is described by the following three categories, determined by the park:

1. Good—This category indicates a high degree of confidence that the quality of the data can reliably assess trends in the measure. Data are highly accurate, reliable, and relevant for the measure.
2. Moderate—This category indicates a medium degree of confidence about the quality of the data. Data are only moderately accurate, reliable, or relevant.

3. Poor—This category indicates a low degree of confidence about the quality of the data. The accuracy, reliability, or relevancy of the data is minimal or unknown.

Parks must evaluate data quantity and quality for all potential data sources. An overall determination of data adequacy is derived by combining the assessments of quality and quantity (Table 3) and is categorized as high, medium, or low. Numerical values are included as an optional level of detail to document the data adequacy ‘rating’.

Table 3. Data Adequacy Rating Table


Data Quantity	+	Data Quality	=	Data Adequacy
Complete (3)	+	Good (3)	=	High (6)
Partial (2)		Moderate (2)		Medium (4-5)
Insufficient (1)		Poor (1)		Low (≤ 3)

There is no minimum data adequacy rating required to use a particular data source. Instead, determining data adequacy ensures the park is aware of the tradeoffs of using the identified data source (tradeoffs that should be well documented in the Wilderness Character Building Blocks Report). Similarly, the data adequacy of a seemingly similar data source may vary from park to park. For example, data relying on professional judgment may receive a medium or high data adequacy rating at park A due to the degree of detail documented over a long timeframe, whereas park B considers data from professional judgment to be a low data adequacy rating because little is documented, and the primary source is unavailable to interview further.

While data adequacy is not used to determine a measure’s trend, it is crucial for interpreting trends (e.g., if there is a declining trend but data adequacy is low, then confidence in this trend would also be low) and for revealing when additional or different data collection efforts may be needed.

Frequency. This section identifies how often measures should be monitored to determine a reported measure value. In some cases, measures will only be monitored once every five years, in accordance with the WCM minimum monitoring frequency requirement. In other instances, the reported measure value for the five-year monitoring interval is a composite of multiple measure values collected in between the current and previous monitoring interval.

Threshold for meaningful change. This section explores how change in a measure affects wilderness character. This section helps distinguish WCM from other NPS monitoring efforts because it links the measure’s intent and corresponding measure value to wilderness character impacts.

 As Step 2 of the “Completing a Wilderness Character Baseline Assessment” section indicates, thresholds for meaningful change should be determined in tandem with selecting the measure to ensure a park is measuring something that can affect wilderness character. Arriving at this determination requires discussion, considering questions like:

- What process will be used to develop and justify thresholds for meaningful change in tandem with measure selection?
- How sensitive should the threshold for meaningful change be? Should it serve as a red flag for coming change or should it convey change that has clearly happened already?
- How do potential thresholds for meaningful change relate to thresholds and desired conditions identified in park planning documents, like a Wilderness Stewardship Plan?
- How do potential thresholds for meaningful change relate to the condition of wilderness character?

The process of determining thresholds for meaningful change is subjective because it typically depends on place-based professional judgment. There is no ‘objective’ process that can make this decision for managers. The complexity, nuance, and context present in a wilderness area must all be accounted for when determining thresholds for meaningful change. This subjectivity means that thresholds for meaningful change will likely differ from park to park. Examples of thresholds for meaningful change include, but are not limited to any change, additive change, percent or multiplicative change, and in some instances, statistical reasoning (if assumptions are assessed).

Caveats and cautions (if applicable). This section describes considerations or other relevant context to keep in mind for the measure. Documentation may expand on known concerns with the measure or make note of potential future modifications that should be revisited during the next monitoring interval.

Key Principles of WCM

To successfully implement this monitoring, NPS staff need to understand the following principles:

A park’s WCM framework is likely to change over time — Consistently using the same measures and measure components over time to determine trends in wilderness character is ideal - but parks should be prepared to evolve and make thoughtful changes if needed. Changes may be prompted by new issues or policy direction, the emergence of new data sources that better address local wilderness stewardship priorities, etc. See the “Modifying the WCM Framework” section for more details.

Lands designated or managed as wilderness are living cultural landscapes. Thoughtful consideration should be given to cultural practices and traditions while identifying wilderness stewardship priorities that are related to WCM — Wilderness character is a combination of many interrelated factors. These factors inform a park’s identified wilderness stewardship priorities and the threats and successes for wilderness character preservation. Because wilderness lands are a living cultural landscape, managers should be sensitive to how wilderness stewardship priorities are determined and framed, demonstrating sensitivity for past and ongoing cultural practices and traditions that may intersect with factors influencing wilderness character.

Management actions often impact more than one quality of wilderness character. For practical reasons, not all qualities impacted may be monitored — Generally speaking, actions that affect more than one quality of wilderness character will be measured only for the quality that is most directly impacted. This helps prevent redundancy in the influence of that action on trend determinations. However, if a park feels strongly that an action should be evaluated through the lens of multiple qualities, and appropriate measures are selected, this is also acceptable. In this instance, an explanation for its inclusion (and recognition of potential redundancy) needs to be documented in the ‘Caveats and cautions’ component of the measure.

Management decisions may preserve or degrade these qualities, and cumulative impacts matter – Wilderness character may be improved, preserved, or degraded by the actions managers decide to take or not take. Protecting one quality of wilderness character may diminish another. Over time, tradeoffs affecting different qualities of wilderness character and the cumulative results of seemingly small decisions and actions may cause a significant gain or loss of wilderness character. With an established WCM framework to discuss these tradeoffs within the context of wilderness character and its five tangible qualities, managers have a tool (to use alongside other tools) that helps to preserve wilderness character as a whole.

Measures that are integral to wilderness character may be monitored, regardless of managerial jurisdiction — Resources that are integral to the area’s wilderness character, but that are not directly under the jurisdiction of managers, are included in this monitoring to the extent that is practical.

Selective use of site-specific measures is permitted — While WCM focuses on monitoring trends in wilderness character across an entire wilderness area, it is not always practical to exclusively select measures that can be monitored area-wide. For instances where a site-specific measure (i.e., portion(s) of the wilderness area that does not encompass the entirety of the wilderness area) enables a park to meaningfully measure something of high priority, a site-specific measure is appropriate. The rationale for using a site-specific measure, and acknowledgement of the tradeoffs for this decision, should be documented in the Wilderness Character Building Blocks Report.

Long-term Wilderness Character Monitoring

WCM does not end with the wilderness character baseline assessment. Long-term monitoring is the recurring monitoring of measures according to protocol described in a park’s Wilderness Character Building Blocks Report (and subsequent WCM framework modification protocol). Monitoring intervals will depend on measure-specific protocol described in the report. At a minimum, this monitoring will occur every five years to identify current reported measure values. The reported measure values will be compared to the baseline measure values to determine trend.

For the five-year reporting intervals, parks are encouraged to use the [WCM Five-Year Reporting Summary Template](#) to document measure values and changes or trend. The summary can be appended to the Wilderness Character Building Blocks Report for co-reference. Parks will also need to enter the current reported measure values into the WCM national database.



[WCM Five-Year Reporting Summary Template](#)

Determining Trend in Wilderness Character

Assessing overall trend in wilderness character provides a readily interpretable conclusion that can help inform future management actions to better preserve wilderness character over time. A trend of improving, stable, or declining is derived for each measure based on the comparison of the reported measure to the baseline measure value and the corresponding threshold for meaningful change⁷. This yields a trend determination at the measure level, which is then rolled-up to determine trend at the indicator, monitoring question, and quality levels, culminating in a trend for overall wilderness character of the wilderness area. Trend roll-ups are determined using nationally consistent, interagency rules. These rules are described in KIW2's "Assessing Trend in Wilderness Character" section. *The NPS distinction between official trend and change differs from KIW2 guidance – while KIW2 rules for trend roll-ups still apply, parks should refer to this Guide when deciding the point at which trend can be assessed in a measure*⁸.

Modifying the WCM Framework

Change is inevitable and measure components, like data sources, protocol, thresholds for meaningful change, and even overall measures are subject to change. When parks consider making a modification to part of their WCM framework, focused discussions about tradeoffs to proposed modifications should happen first, with interdisciplinary representation. Parks may also contact their Regional Wilderness Coordinator and the WASO Wilderness Stewardship Division to discuss the appropriateness and feasibility of proposed modifications.

Documenting modifications

When modifications are agreed-upon and finalized, documentation is a must. Parks should update the Wilderness Character Building Blocks Report and/or WCM Five-Year Reporting Summary with:

- The specific modification
- Date of the modification
- The reason(s) for this decision
- The potential impact(s) on interpreting trend in wilderness character

⁷ Trend is officially determined by comparing the current 'reported measure value' to the 'baseline measure value' if the current 'reported measure value' includes a minimum of five data points. Trend is determined by the measure's corresponding 'threshold for meaningful change' to help interpret the comparison and conclude if the trend is improving, stable, or declining. Absent the availability of five data points, 'change' (rather than trend) between current and baseline measure values can still be discussed and documented. Assessing changes in wilderness character prior to formal trend conclusions can yield helpful information for managers that is further strengthened through trend assessments.

⁸ Within this Guide, references to 'trend' also represent 'change' where appropriate, based on the limitations of how 'change' is defined.

Modification impacts on determining trend

Depending on the specifics of the modification, this may substantially impact a trend determination. Since trend is a comparison of the current reported measure value to the baseline measure value (according to the threshold for meaningful change), a substantial modification may mean the current measure is fundamentally different from the baseline measure, making a comparison difficult. In cases where substantial discrepancies occur, parks have two options:

1) Acknowledge the discrepancy in the five-year monitoring interval

Document the discrepancy and skip the trend determination for that particular measure during the five-year monitoring interval the change occurred. If there is only one measure for the required indicator, this also means there will be no trend for the indicator.

- Example: Park X's baseline assessment included one measure about natural landcover for the 'Ecological Processes' indicator (no other measures were used for this indicator). Five years later, when the park was assessing trend between the baseline and first monitoring interval, staff determined the natural landcover measure did not sufficiently address the park's wilderness stewardship priorities. Instead, the park wanted to use a fire-related measure that they would begin collecting data on that year (establishing a baseline measure value). Meanwhile, all other measures had not only a baseline measure value, but a second reported measure value generated during the first monitoring interval. The park decided to retain the original overall WCM baseline year and assess trend for all other measures during this monitoring interval. This allowed the park to also roll-up trend at all other levels of the WCM framework, recognizing that the Ecological Processes indicator did not influence trend roll-ups because there was no trend to report on. The next monitoring interval will resume inclusion of all measures used as there will be a new reported measure value for the fire measure. This will allow for the second trend assessment to include the Ecological Processes indicator too.
- Parks should be clear that this choice means an overall trend determination for wilderness character is less holistic than prior or future monitoring intervals because some aspects of wilderness character represented by the measure and/or indicator are absent. Documentation of the rationale for this tradeoff is essential.

2) Revise the wilderness character baseline assessment

Update the wilderness character baseline assessment with the identified modification(s). Depending on the details of the modification(s), this may result in changes to the measure baseline year and the WCM baseline year too.

- Example: Using the same example as above, Park X's baseline assessment included one measure about natural landcover for the 'Ecological Processes' indicator (no other measures were used for this indicator). Five years later, when the park was assessing trend between the baseline and first monitoring interval, staff determined the natural landcover measure did not sufficiently address the park's wilderness stewardship priorities. Instead, the park wanted to use a fire-related measure that they would begin collecting data on that year. The park felt strongly that this new measure should influence how trend is assessed for the park and thus opted to reset the overall WCM baseline year to accommodate inclusion of this new measure. The park will postpone

assessing trend until the second monitoring interval when every measure has a current reported measure value to compare against the baseline measure value.

- Parks should be clear that this choice maintains best practices for determining trend, supporting the holistic consideration of wilderness character. However, this approach can set back the overall monitoring timeline, affecting the time before trend can be determined. In other instances, these changes may not affect the trend timeline (e.g., a new data set used has the same length of availability as the previously used data set; a new approach to identifying thresholds for the measure does not affect when measure values can be reported; etc.).

How This Guidance Relates to Parks That Have Already Implemented WCM

Parks that have already implemented WCM prior to the release of this Guide will need to confirm that their monitoring protocol follows the NPS modified WCM framework described in the “National WCM Framework” section. For WCM framework components that need updating, the same two options apply as described in the “Modifying the WCM Framework” section. These options apply not only to single measure changes, but other parts of the WCM framework including the omission of now-optional indicators and now-required use of the Other Features of Value Quality.

Roles and Responsibilities

Implementing WCM at a park is a collaborative effort between park staff, the region, the WASO Wilderness Stewardship Division, and technical specialists. Table 4 describes the different groups involved in WCM and their respective roles.

Table 4. NPS groups and their respective WCM roles

NPS Group	WCM Role(s)
Park wilderness coordinator	<ul style="list-style-type: none"> • Coordinate the development of the wilderness character baseline assessment, documented in the Wilderness Character Building Blocks Report.
Park interdisciplinary staff	<ul style="list-style-type: none"> • Develop wilderness character baseline assessment, and document in the Wilderness Character Building Blocks Report. • Monitor wilderness character on a five-year interval minimum, documented through the WCM Five-Year Reporting Summary. • Enter wilderness character baseline assessment and monitoring data into the WCM national database every five years.
Park superintendent	<ul style="list-style-type: none"> • Review, approve, and sign Wilderness Character Building Blocks Report.

Regional Wilderness Coordinators	<ul style="list-style-type: none"> • Support parks in developing wilderness character baseline assessments and monitoring, including assistance with identifying regional datasets, expertise, and potential supplemental funding sources. • Review and sign (for concurrence) Wilderness Character Building Blocks Reports as needed (prior to Superintendent's signature). • Liaise between the parks and WASO Wilderness Stewardship Division for emergent WCM needs/issues.
WASO Wilderness Stewardship Division	<ul style="list-style-type: none"> • Support park-based development of wilderness character baseline assessments and monitoring, including assistance with identifying national datasets, expertise, and potential supplemental funding sources. • Review and sign (for concurrence) Wilderness Character Building Blocks Report (prior to Superintendent's signature). • Manage access to the WCM national database. • Generate servicewide wilderness character trend reports as appropriate. • Update WCM policy and guidance as needed.
Other NPS Washington Support Offices (WASO)	<ul style="list-style-type: none"> • Support WCM through data collection, data access, or subject matter expertise.
Interagency WCM Work Group	<ul style="list-style-type: none"> • Coordinate WCM efforts between agencies.

Updating this Guide

The *NPS Wilderness Character Monitoring Technical Guide* will be updated and reviewed periodically, coordinated by the NPS Wilderness Stewardship Division. These changes will be catalogued, allowing users to access the most current version.

How WCM Relates to Wilderness Stewardship Planning, Compliance, and Operations

WCM should directly inform a Wilderness Stewardship Plan (WSP) (or equivalent plan), but it is not a WSP itself. Ideally, parks would complete a WCM baseline assessment, documented in the Wilderness Character Building Blocks Report, early in the WSP planning process (if this assessment has not already been completed).

The WCM framework helps clarify park-specific wilderness stewardship priorities and results of the WCM baseline assessment are the reference point for future wilderness character trend determinations. These priorities and trend details can help inform desired conditions, standards, management actions, and other planning components within WSPs (see Figure 1: WSP Framework in the [NPS Wilderness Stewardship Plan Handbook](#)).

WCM is not a singular decision or management plan. WCM should help inform planning efforts involving wilderness - any decisions informed by WCM results are subject to other federal laws (Americans with Disabilities Act, Clean Air Act, Clean Water Act, Endangered Species Act, National Environmental Policy Act, National Historic Preservation Act, etc.) and NPS policy requirements.

WCM should also be used as a means of informing priorities and needs for ongoing wilderness stewardship operations.

The procedures outlined in this Guide meet the following compliance criteria established in the NPS NEPA Handbook, Section 3.2 – Categorical exclusions for which no documentation is required: “Plans, including priorities, justifications, and strategies, for non-manipulative research, monitoring, inventorying, and information gathering.” The authority for categorically excluding an action rests with the park unit’s superintendent (*Director’s Order 12, Section 5.4*).

Untrammeled Quality

The objective of monitoring the Untrammeled Quality is to assess whether management of a wilderness area is trending over time toward more or less intentional human manipulation of the biophysical environment and community of life. Section 2(c) of the Wilderness Act defines wilderness as “an area where the earth and its community of life are untrammeled by man,” that “generally appears to have been affected primarily by the forces of nature” and is an area “retaining its primeval character and influence.”

Essentially unhindered and free from the intentional actions of modern human control or manipulation.

The Untrammeled and Natural Qualities are closely related, though they differ in a key way—the Untrammeled Quality examines *actions* that intentionally control or manipulate ecological systems inside wilderness, whereas the Natural Quality examines the *effects* on these systems from actions taken inside wilderness or from external forces, regardless of management objective. Separating actions from effects offers a clearer distinction between these two qualities and their influence on overall wilderness character.

The Untrammeled Quality is explored through one monitoring question, one required indicator, and one optional indicator.

MONITORING QUESTION: What are the trends in actions that intentionally control or manipulate “the earth and its community of life” inside wilderness?

This single monitoring question for the Untrammeled Quality examines actions that intentionally control or manipulate the components or processes of ecological systems inside wilderness. In this context, intentional manipulation means an action that deliberately alters, hinders, restricts, controls, or manipulates “the earth and its community of life.” This includes actions that affect plants or animal species, insects and disease pathogens, physical resources (e.g., water or soil), or biophysical processes (e.g., fire) inside a wilderness area.

When monitoring the Untrammeled Quality, all trammeling actions are counted the same regardless of the area, intensity, frequency, or duration of their effects. This is because the Untrammeled Quality focuses on whether a particular decision to manipulate “the earth and its community of life” is made, not on the magnitude of that decision. In other words, taking any trammeling action degrades the Untrammeled Quality, regardless of its scope and scale. For practical reasons, however, this Guide considers magnitude when questions arise as to whether a seemingly inconsequential action truly manipulates “the earth and its community of life” and should be addressed.

Actions that degrade the Untrammeled Quality are typically the result of administrative decisions made by managers. However, intentional activities by other federal and state agencies, non-governmental organizations, or the public may also affect this quality. For this reason, parks are required to monitor authorized trammeling actions and can *optionally* monitor unauthorized trammeling actions if these actions are of high interest to the park and sufficient data sources exist to monitor.

REQUIRED INDICATOR: Actions authorized by the federal land manager that intentionally manipulate the biophysical environment

This indicator tracks all significant actions authorized by the park that intentionally manipulate the biophysical environment, including those allowed under Section 4(d)(1) of the Wilderness Act (which states “measures may be taken as may be necessary in the control of fire, insects and disease, subject to such conditions as the Secretary deems desirable”). Intentional manipulations taken by other federal agencies, state and tribal agencies, and private citizens are included under this indicator if these actions are authorized by the park that manages the wilderness. Trend in this indicator tracks whether managers are practicing restraint to allow a wilderness area to exist in its free and self-willed condition.

OPTIONAL INDICATOR: Actions not authorized by the federal land manager that intentionally manipulate the biophysical environment

This optional indicator attempts to identify actions that have not been authorized by the park that intentionally manipulate the biophysical environment. Given the challenge to confidently account for unauthorized actions, this indicator is not required and can be skipped if accompanied by a thoughtful documented justification in the Wilderness Character Building Blocks Report.

For parks where unauthorized trammeling actions are of high concern and data adequacy is reasonable, use of this indicator is encouraged. Unauthorized intentional manipulations of plants, animals, physical resources, or biophysical processes within wilderness have the potential to affect all qualities of wilderness character. These actions are fundamentally different from those authorized by the park: most authorized manipulations undergo a review process to determine their impacts on the various resources within wilderness, but unauthorized manipulations are often undertaken with little to no consideration for their effects on broader ecological systems within wilderness and on the other qualities of wilderness character.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the two indicators above are available for review and optional use.

Natural Quality

The objective of monitoring the Natural Quality is to assess the effects of modern civilization on the integrity of wilderness ecosystems, with a focus on plants, animals, air and water, and ecological processes. The Wilderness Act defines wilderness as an area that “is protected and managed so as to preserve its natural conditions” and that these areas should be free from the effects of “an increasing population, accompanied by expanding settlement and growing mechanization” (Sections 2(c) and 2(a), respectively). Human-caused changes to wilderness ecological systems can be intentional or unintentional.

Ecological systems which are substantially free from the effects of modern civilization.

In contrast to the Untrammeled Quality which monitors *actions* that manipulate or control ecological systems, the Natural Quality monitors the *effects* on wilderness ecosystems from human actions. While this quality encompasses all the naturally occurring species, physical resources, and ecological functions and processes in wilderness, practical limitations require that a relatively small but important subset of this quality are monitored.

The Natural Quality is a complex and challenging concept to monitor. Change over time and from one place to another is a fundamental aspect of ecological systems and is an essential aspect of this quality. The emphasis on modern human-caused change can inadvertently lead to a false separation between humans and the rest of the biological world. In attempting to monitor this quality, managers should be careful to not oversimplify contributors and effects, which are often interrelated and inseparable. Exploring the concept of ‘ecological integrity’ may help managers more holistically consider the complexity of this quality.

Modern humans are the focal source of identified effects. This distinction is simultaneously important and difficult to implement. For the purposes of WCM, modern is defined as the time since the area was first managed to preserve wilderness character. For most parks, this will be the year a wilderness eligibility assessment, or equivalent documentation, was completed.⁹

For practicality purposes, the Natural Quality inherently relies on a reference state (i.e., the baseline measure value) to determine trend in the measure for the five-year monitoring intervals. The conditions for trend determination are admittedly not ideal for this quality, since these references depend on a fixed state that does not reflect the dynamic, ever-changing complexity of ecosystems. This shortcoming should be acknowledged when developing WCM details for the Natural Quality.

The Natural Quality is explored through one monitoring question and four indicators, where use of at least two indicators is required.


⁹ The use of modern helps managers determine the scope of time to consider when assessing impacts to wilderness character and does not negate the longstanding and ongoing relationships shared between people and lands currently managed as wilderness. The definition of ‘modern’ may be modified if agreement is reached by the park’s interdisciplinary wilderness team, including representation from cultural resources and facilities. A thoughtful rationale for the definition modifications must be documented in the Wilderness Character Building Blocks Report.

MONITORING QUESTION: What are the trends in the natural environment from human-caused change?

This single monitoring question assesses the trends in wilderness ecosystems that result from human-caused threats occurring since the area was first managed to preserve wilderness character. As stated earlier in this chapter, hardline distinctions between change contributors can be problematic and thoughtful reflection on the shortcomings of these distinctions should be documented in the Wilderness Character Building Blocks Report. With the shortcomings identified, parks should work to identify effects that *include* human causes, recognizing that other factors may compound the issue but will not be as directly addressed in the WCM framework.

Four indicators represent a range of ecosystem components and functions in wilderness: (1) plants, (2) animals, (3) air and water, and (4) ecological processes. Parks are required to use at least two of the four indicators. This increased flexibility empowers parks to engage with this quality in meaningful and locally relevant ways, recognizing the challenges described in the Natural Quality introduction.

Practical and conceptual constraints mean that not everything important to wilderness ecosystems can be included. Likewise, not all ecological data and knowledge currently collected by scientists and other knowledge holders are relevant or necessary to include in WCM. Ecological components not included in this quality can still be acknowledged through the qualitative Wilderness Character Narrative (part of the ‘Wilderness Basics’ building block) to better convey the holistic scale of ecosystem health and functionality.

 The Natural Quality’s indicators should be cautiously approached. The deceptive simplicity of the Natural Quality’s indicators could prompt parks to monitor animals, plants, air, water, or ecological processes in isolation. For WCM purposes, monitoring needs to demonstrate a relationship between the specific measure and overall wilderness character. Before determining which of the Natural Quality’s indicators to use, parks should:

1. Think holistically about the Natural Quality - refer back to the quality’s definition and the definition of wilderness character overall.
2. Consider which of the indicators help managers better understand the nexus between that indicator/measure and wilderness character.
 - a. Stated in another way, just because there is data related to animals in wilderness does not necessarily mean the ‘Animals’ indicator should be used - how does this data (and the corresponding measure) meaningfully inform understanding of the monitoring question, Natural Quality, and wilderness character as a whole?
3. Discuss: When an indicator is selected, how might the corresponding measure represent more than one factor to avoid myopic focus that has a disproportionate influence on trends in the Natural Quality?
 - a. For example, if a species-oriented measure is identified for the ‘Animals’ or ‘Plants’ indicators, consider the use of multiple species (either through multiple measures or a single indexed measure) to better represent natural variation that is also a part of wilderness character.

IF SELECTED INDICATOR IS: Plants

This indicator focuses on threats to native plant species and communities. Native plant species are an essential biological component of wilderness ecosystems, as they are uniquely adapted to their local environment and contribute to ecosystem function via their interactions with other organisms and the abiotic environment. Native plants play an important role by providing food and habitat to animals, preventing soil erosion and contributing to soil health, and maintaining healthy environmental conditions and biodiversity. Alterations of plant communities within wilderness may result in changes to the composition, structure, and function of these communities, as well as cascading effects to the larger community of life within the wilderness.

One of the primary threats to native plant communities is the introduction of invasive species (as defined in Executive Orders [13112](#) and [13751](#)) and the subsequent impacts of these invaders on the ecological community. Three key terms are defined here for consistent reference (and also apply to 'Animals' indicator):

- *Invasive species* = with regard to a particular ecosystem, a nonnative organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health (see Executive Orders 13112 and 13751).
- *Native species* = with respect to a particular ecosystem, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem (see Executive Orders 13112 and 13751).
- *Nonnative species* = with respect to a particular ecosystem, an organism, including its seeds, eggs, spores, or other biological material capable of propagating that species, that occurs outside of its natural range (see Executive Orders 13112 and 13751).

IF SELECTED INDICATOR IS: Animals

This indicator focuses on threats to native animal species and communities. Native animal species and communities are an essential biological component of natural wilderness ecosystems. They are critically important to the entire ecosystem by providing food and habitat, digesting plant material and thereby making nutrients available in the soil for organisms to use, scavenging carcasses of dead animals, and contributing to a wilderness ecosystem in many other ways. If applicable, see definitions of 'invasive species', 'native species', and 'nonnative' species in "Plants" indicator for reference.

IF SELECTED INDICATOR IS: Air and water

This indicator focuses on threats to air quality and water quality and quantity. If this indicator is selected, the park can monitor the air component, water component, or both components of the indicator. Parks are not required to monitor both air and water to address this indicator.

Air and water are fundamental physical resources of wilderness ecosystems, and both are essential to maintain properly functioning ecological systems inside wilderness. Both air and water resources are vulnerable to degradation by pollutants produced outside of wilderness due to human development and industrial activity. The protection of both resource categories comes under the legal direction of the NPS Organic Act and the federal [Clean Air Act](#) and [Clean Water Act](#).

The presence of airborne pollutants in soil and water within wilderness can have direct adverse effects on sensitive plant and animal species and can directly impact essential ecosystem functions, such as nutrient cycling. Certain air pollutants also can reduce visibility. Engaging with other federal agencies, states, tribes, industry, and the public is important for advancing strategies for avoiding and/or reducing the effects of air pollution on park resources and values in all wilderness areas.

In addition to air pollutants, water quality and water flows are vulnerable to the effects of physical manipulations inside and outside of wilderness. For example, dams outside a wilderness can markedly affect water quantity and quality, as well as stream morphology, inside a wilderness. Most existing NPS wilderness areas include relatively undeveloped headwater watersheds with few water quality impacts. More recent additions to the NWPS may include areas that are impacted by upstream watershed activities, such as by agriculture, mining, and land development.

External threats to this indicator (i.e., threats outside park boundaries) can be challenging to monitor, particularly when threats are more dispersed. Despite its challenges, these threats are still important to acknowledge as they have equally impactful outcomes for wilderness character. Identifying related measures may also help prepare parks to better engage with these issues through partner relationship-building, public education, and cross-boundary collaboration.

Most parks are encouraged to monitor air according to the measures listed in the '[Measure Idea Templates](#)' supplement to this Guide. Water measures are more difficult to standardize and have greater range in data availability. These challenges may mean not all parks are practically able to include water in the WCM framework. For parks that do not include air and/or water measures, these elements should be addressed qualitatively in the Wilderness Character Narrative.

IF SELECTED INDICATOR IS: Ecological processes

This indicator focuses on threats to ecological processes that affect biotic and abiotic components of wilderness ecological systems. Ecological processes are the interactions among the biotic and abiotic components of ecosystems and include disturbance events (e.g., fire, windstorms, insect and pathogen outbreaks), predation, competition, decomposition, symbioses, nutrient cycling, etc.

The integrity of ecological processes is crucial to maintaining the Natural Quality of wilderness character, and yet ecological processes are complex and can be difficult to measure. For high priority ecological processes not addressed in the WCM framework, parks should describe their importance in the Wilderness Character Narrative.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the four indicators above are available for review and optional use.

Undeveloped Quality

The objective of monitoring the Undeveloped Quality is to assess whether a wilderness is becoming more developed over time. Development can include such things as increasing evidence of physical infrastructure or a greater prevalence of mechanized uses, such as helicopters and chainsaws. The opening sentence of the Wilderness Act, Section 2(a) states that the NWPS was created “in order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States...” Section 2(c) of the Wilderness Act defines wilderness as “an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation.”

Retaining its primeval character and influence, and essentially without permanent improvement or modern human occupation.

Monitoring the Undeveloped Quality assesses how physical developments and motorized and mechanized use within wilderness are trending over time. Key indicators and measures monitor developments, inholdings, and various types of motorized and mechanized use.

The Undeveloped Quality is explored through two monitoring questions, two required indicators, and one optional indicator.

MONITORING QUESTION: What are the trends in non-recreational physical development?

This monitoring question addresses the presence of physical development that most often typifies evidence of human occupation and modification, including both non-recreational physical developments and inholdings.

REQUIRED INDICATOR: Presence of non-recreational structures, installations, and developments

This indicator focuses on the physical evidence of human occupation and modification, such as roads, buildings, and dams. Developments related to recreational use (e.g., trails, toilets, bridges) are excluded because they are addressed in the Solitude or Primitive and Unconfined Recreation Quality.

Per guidance in KIW2, developments are addressed in either the Undeveloped Quality or the Solitude or Primitive and Unconfined Recreation Quality depending on their primary purpose. Developments primarily installed for non-recreational administrative purposes should be addressed in this quality, whereas developments that primarily serve a recreational purpose belong in the Solitude or Primitive and Unconfined Recreation Quality, under the “Facilities that decrease self-reliant recreation” indicator. For developments that may serve both administrative and recreational purposes, it is up to the discretion of the park to decide which quality to assign - parks should use their best judgment in this scenario and document their rationale in the Wilderness Character Building Blocks Report. This split between administrative and recreational developments helps prevent the double counting of related items. In this sense, the concept of "substantially unnoticeable" can be applied to two wilderness character qualities.

While this indicator tracks on the presence of administrative structures, installations, and developments, it may be unrealistic to complete a comprehensive inventory for all parks. Parks should approach this indicator in way that feels locally useful and practical, even if comprehensive tracking is not feasible. This means that parks may decide to only focus on one (or two) of the three components listed for this indicator (i.e., structures, installations, developments) – if not all three components are addressed, a thoughtful rationale should be documented in the Wilderness Character Building Blocks Report. Parks should also decide if unauthorized administrative developments should be included in this indicator. Tracking unauthorized developments can be difficult and is not required.

For WCM purposes, parks should omit historical structures and other developed cultural assets (i.e., installations) from this indicator (and the overall Undeveloped Quality) that *pre-date* the year the area was first managed to preserve wilderness character. For most parks, this will be the year a wilderness eligibility assessment, or equivalent documentation, was completed. This means historical structures and other developed cultural assets that were built after the wilderness eligibility assessment (or equivalent documentation) should be accounted for in this indicator.

The positive contributions of cultural resources to wilderness character should be addressed in the Other Features of Value Quality.

OPTIONAL INDICATOR: Presence of inholdings

This optional indicator focuses on the physical evidence of modern human occupation and modification within inholdings.¹⁰ Given that not all NPS wilderness areas have inholdings, and the potential sensitivity of addressing private property in the WCM framework, this indicator is not required and can be skipped if accompanied by a thoughtful documented justification in the Wilderness Character Building Blocks Report.

For parks where inholdings are important to monitor because of their potential to substantially affect wilderness character, use of this indicator is encouraged.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the two indicators above are available for review and optional use.

¹⁰This indicator is optional for both parks *with* inholdings and those *without* inholdings.

MONITORING QUESTION: What are the trends in mechanization?

This monitoring question explores the effect of motorized equipment and mechanical transport on the Undeveloped Quality. Ideally this would include authorized uses (such as for administrative, emergency, and special provision purposes), as well as unauthorized uses. However, including unauthorized uses is not required and should be decided by the park.

Although the Wilderness Act and subsequent legislation allow motorized equipment or mechanical transport under certain conditions (see below for more information), their use diminishes the Undeveloped Quality. Monitoring the use of motorized equipment and mechanical transport over time can help make sound decisions informed by the Wilderness Act.

REQUIRED INDICATOR: Use of motor vehicles, motorized equipment, or mechanical transport

This indicator focuses on the use of the three forms of mechanization discussed in Section 4(c) of the Wilderness Act: (1) motor vehicles, (2) motorized equipment, and (3) mechanical transport. These mechanization forms have direct and indirect impacts on the Undeveloped Quality. Landing of aircraft should also be factored into measures associated with this indicator.

While this indicator tracks on the use of motor vehicles, motorized equipment, and mechanical transport, it may be unrealistic to complete a comprehensive inventory for all parks. Parks should approach this indicator in way that feels locally useful and practical, even if comprehensive tracking is not feasible. This means that parks may decide to only focus on one (or two) of the three components listed for this indicator (i.e., motor vehicles, motorized equipment, mechanical transport) – if not all three components are addressed, a thoughtful rationale should be documented in the Wilderness Character Building Blocks Report.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the indicator above are available for review and optional use.

Solitude or Primitive and Unconfined Recreation Quality

The objective of monitoring the Solitude or Primitive and Unconfined Recreation Quality is to assess whether management of a wilderness is trending over time towards protecting outstanding opportunities for the specific, unique recreational experiences cited in the Wilderness Act. Monitoring focuses on three aspects of the quality:

Wilderness has outstanding opportunities for solitude or a primitive and unconfined type of recreation.


1. Solitude
2. Primitive recreation
3. Unconfined recreation

The Solitude or Primitive and Unconfined Recreation Quality is explored through two monitoring questions, three required indicators, and one optional indicator.

Meaningfully monitoring this quality

The Wilderness Act mandates federal land managers to protect outstanding opportunities for a “solitude or a primitive and unconfined type of recreation” (Wilderness Act, Section 2(c)). These recreational opportunities are subjective to the recreator and can make protecting them particularly challenging. Also note the use of “outstanding opportunities for” - wilderness areas are not expected to offer a sense of solitude or a primitive and unconfined recreational experience all the time or in all wilderness settings. Rather, parks should consider whether the wilderness area does have some opportunities to personally connect to these recreational concepts. And while the NPS cannot guarantee that visitors will have such experiences, we must protect conditions that promote such opportunities and keep them from declining over time. Visitors may desire experiences other than those described in the Wilderness Act, but those experiences are not part of the legislated requirement to preserve wilderness character.

Measures using qualitative or mixed methodology data sources - like surveys, interviews, comment cards, etc. – are a preferred means to address the nexus between the wilderness area and visitors’ perceptions of opportunities for solitude or primitive and unconfined recreation. If a quantitative measure is practically necessary, an encounters-based measure is encouraged. Parks should only use general visitation-based measures (e.g., annual wilderness visitation, visitation trends, etc.) if one of the above options is prohibitively impractical to implement.

 During the early stages of discussing measure options for this quality, parks should convene an interdisciplinary team to brainstorm ideas. Because the WCM framework splits this quality into separate components for solitude versus primitive and unconfined, these considerations can be asked about both halves of this quality. While similar questions can be asked, each half of this quality is likely to generate different responses. Consider the following questions to initiate discussion:

- What do opportunities for solitude/primitive and unconfined recreation mean to park staff? Do you have any sense of how visitors feel?

- What does the scientific literature say about the meaning of solitude/primitive and unconfined recreation?
- Does a solitude/primitive and unconfined experience feel (i.e., perceptions) different in the wilderness area than elsewhere in the park?
- How does better understanding solitude/primitive and unconfined recreation in wilderness relate to the park's overall wilderness stewardship priorities?
- What does a meaningful way to *measure* opportunities for solitude/primitive and unconfined recreation in wilderness look like for the park?
 - What tools/approaches could be used to measure this?
 - Surveys
 - Post-trip interviews
 - Comment cards (physical or digital)
 - Other tools?
- If cost and time were not an issue, how would the park most like to measure opportunities for solitude/primitive and unconfined recreation in the wilderness area?
 - Is this option currently available to the park?
 - If this option is not currently available, what are the limitations preventing the park from pursuing it?
 - Are these limitations significant enough to remove this option from further consideration?

If after considering the above questions, the park is interested in exploring qualitative ways to understand opportunities for solitude/primitive and unconfined experiences, consider:

- How much capacity does the park have to collect and analyze qualitative data (duration, frequency, method type)?
- What does solitude/primitive and unconfined recreation mean to a diverse range of visitors or wilderness-interested people?
- Because this quality emphasizes *opportunities for* (rather than comprehensive wilderness-wide offerings), are there particular locations, trip types, or dates/seasons that the park is especially curious about?
- Are there existing OMB-approved generic packages that the park could use for this effort?

Addressing offsetting impacts of this quality

The distinct components of this quality - solitude, primitive recreation, and unconfined recreation – while equally important, can sometimes be at odds with each other. For example, actions taken to enhance solitude (like requiring the use of permits) can simultaneously reduce opportunities for unconfined recreation. This nuanced challenge demonstrates the tradeoffs inherent to holistic wilderness character preservation and these tradeoffs should be thoughtfully determined and well documented. See the 'Management Restrictions on Visitor Behavior' indicator for an example.

MONITORING QUESTION: What are the trends in outstanding opportunities for solitude?

This monitoring question addresses the experience of solitude. The Wilderness Act recognizes that wilderness, protected from human development or settlement, can provide an opportunity for solitude not available in other places. A review of wilderness writings suggests that solitude encapsulates a range of experiences, including but not limited to privacy, being away from civilization, inspiration, self-paced activities, and a sense of connection with times past (Borrie and Roggenbuck 2001; Cole 2012; Lang 2018). Solitude is a multidimensional and deeply personal value and experience. Parks should consider a holistic suite of potential solitude goals their users may have, as preferences for what constitutes a solitude experience vary widely.

REQUIRED INDICATOR: Remoteness from sights and sounds of human activity inside wilderness

The following broad indicator guidance should be consulted in coordination with place-based conversations and research (if available) to ensure the park’s framing of solitude reflects local context.

The opportunity to achieve solitude is often addressed as a function of both the density and location of visitors within wilderness. The presence of other visitors outside one’s own group may impact the solitude experience. Additionally, recreation impacts at campsites and other locations where visitors congregate are some of the more prevalent and obvious human impacts that wilderness visitors may encounter (Seekamp and Cole 2009).

Remoteness, meaning distance from the sights and sounds of civilization, may be important for achieving a sense of solitude (Dawson 2004). Research shows that most wilderness visitors stay on developed trails and most wilderness use concentrates within a few miles of trailheads and access points, especially where day use makes up most of the visitation. Therefore, remote locations further in on a trail or away from trails altogether, or recreation management practices that limit use in popular areas within a wilderness (e.g., day or overnight use permits), may provide opportunities for visitors to find solitude.

OPTIONAL INDICATOR: Remoteness from sights and sounds of human activity outside wilderness

This optional indicator focuses on impacts to solitude that originate outside of the wilderness boundary. Impacts from outside of wilderness can include both sights and sounds from the surrounding park and those from outside the park entirely. Although legal protections of wilderness do not extend to activities occurring outside a wilderness boundary, these activities can still degrade the wilderness experience by affecting a sense of solitude. Given the subjectivity of solitude and the challenges parks may face in addressing beyond-park threats to this topic, this indicator is not required and can be skipped¹¹ if accompanied by a thoughtful documented justification in the Wilderness Character Building Blocks Report.

¹¹ Before omitting, parks are encouraged to consider the feasibility of this measure. If monitoring sights and sounds entirely outside the jurisdiction of the park is not possible, are there other options available (i.e., sights and sounds originating from outside the wilderness boundary, but still within the boundaries of the park itself)?

The following broad indicator guidance should be consulted in coordination with place-based conversations and research (if available) to ensure the park’s framing of solitude reflects local context.

Section 2(c) of the Wilderness Act defines wilderness as an area with “the imprint of [people’s] work substantially unnoticeable.” As nearby population centers expand, the evidence of human activities and developments outside and adjacent to wilderness increases, thereby decreasing opportunities for solitude within wilderness.

Signs of human activity and development outside wilderness manifest in many ways, including sounds from automobiles and off-highway vehicles on nearby travel routes, decreased visibility from air and light pollution, and visual evidence of increasing urbanization from high ridges and peaks. While many activities outside wilderness have the potential to affect the opportunities for solitude within wilderness, not all activities will be monitored as data may be unavailable for either the extent of the activities or their effect within wilderness.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the two indicators above are available for review and optional use.

MONITORING QUESTION: What are the trends in outstanding opportunities for primitive and unconfined recreation?

This monitoring question helps emphasize the second half of the Solitude or Primitive and Unconfined Recreation Quality. The primitive and unconfined elements of this quality help translate Wilderness Act references to a more ‘undeveloped’ and ‘natural’ environment into a recreational experience. Like the challenges of monitoring solitude, a sense of primitive and unconfined recreation is subjective. And wilderness areas should protect *opportunities* for users to experience their sense of what primitive and unconfined recreation means. For some, this may mean non-motorized and non-mechanized travel, self-reliance, self-discovery, or the need to palpably feel away from the pressures of a more fast paced, modern society.

Parks should consider a holistic suite of potential primitive and unconfined recreation goals their users may have, as preferences for what constitutes this experience varies widely.

REQUIRED INDICATOR: Facilities that decrease self-reliant recreation

This indicator focuses on the presence of facilities in wilderness that decrease opportunities for self-reliant recreation. Though many of these facilities are in place to protect resources and or a sense of solitude, they may adversely affect opportunities for a primitive and unconfined recreational experience. This dichotomy underlines the challenge of preserving wilderness character and even preserving potentially conflicting aspects within the Solitude or Primitive and Unconfined Recreation Quality. Tradeoffs are inherent to wilderness character preservation and will be better understood through WCM. While a park’s WCM framework cannot account for and balance every tradeoff, the Wilderness Character Building Blocks Report should document tradeoffs and specifically acknowledge any shortcomings that cannot feasibly be addressed.

This indicator provides a means for measuring trends in the presence of durable or relatively permanent facilities that reduce opportunities for primitive recreation. Recreation facilities can include trails, bridges, signs, campsites, and other infrastructure. Although many recreational facilities are physical developments that could be included under the Undeveloped Quality, to avoid double counting, they are only counted under this quality and indicator.

REQUIRED INDICATOR: Management restrictions on visitor behavior


Management restrictions in wilderness are often adopted to protect resources or support opportunities for solitude. However, unconfined recreation often refers to recreation types where visitors experience a high degree of freedom over their own actions and decisions (Dustin and McAvoy 2000; Dawson and Hendee 2009). Management restrictions are likely to degrade this indicator.

This indicator addresses NPS restrictions on visitor behavior in wilderness, encompassing formally adopted regulations or policies that govern visitor behavior, travel, or equipment. Remember, this quality focuses on *outstanding opportunities* for solitude or primitive and unconfined recreation. Wilderness areas are not expected to eliminate all management restrictions. Instead, restrictions can vary and may be geographic, seasonal, or temporal in scope, such as restrictions that occur year-round throughout the entire wilderness (or to a particular location of the wilderness identified as especially integral to the area like the Black Canyon in the Black Canyon of the Gunnison Wilderness or the Arrigetch Peaks in the Gates of the Arctic Wilderness).

Off-Setting Effects within this Quality

Selecting appropriate measures for the Solitude or Primitive and Unconfined Recreation Quality presents a complex and distinct challenge in that some management restrictions are imposed with the intent of improving solitude, a structurally separate component of this overall quality.

For example, group size limits are a management restriction commonly associated with its negative effect on opportunities for primitive and unconfined recreation - yet the same management restriction has a positive effect on improving solitude. For WCM purposes, this scenario is considered an ‘offsetting’ effect on wilderness character.¹²

 Failure to adequately address offsetting effects and their conflicting relationship within the same quality may result in a bias that is not entirely reflective of the overall trend for the quality. Managers should consider one of the following options to reconcile this offsetting conflict:

1. Include the restriction as part of the measure but describe the offsetting effects in the Wilderness Character Building Blocks Report, Wilderness Character Narrative, and

¹² Offsetting effects can occur within a single quality (e.g., solitude or primitive and unconfined recreation) or between qualities (e.g., the Recreation Quality and the Natural Quality).

subsequent Five-Year Reporting Summaries to ensure the rationale is well documented and helps inform how to interpret trends in this quality.

2. Eliminate potential bias within the same quality by excluding (and documenting) offsetting restriction(s) from the measure.
3. Include the restriction in a weighted restriction index but assign it a weight of zero (or reduce the weighting to be less than other restrictions).
4. Add at least one corresponding offsetting measure(s) in the 'What are the trends in outstanding opportunities for solitude' monitoring question that represents benefits afforded by management restrictions.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the two indicators above are available for review and optional use.

Other Features of Value

Section 2(c) of the Wilderness Act defines wilderness as an area that "... may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." Including such features, if they exist and play an integral role in defining the meaning and value of the area as wilderness, can provide a more holistic picture of wilderness character. The objective of monitoring the Other Features of Value Quality is to assess how the condition of important tangible features of ecological, geological, scientific, educational, scenic, and historical value are changing.

Wilderness may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Unlike the other qualities that apply to the entirety of a wilderness, the features monitored within the Other Features of Value Quality usually occur only at specific sites, although some features, such as cultural landscapes and certain geological or paleontological formations may occur over larger areas. Additionally, for some features, there is no one site-specific feature that adequately represents the feature of value, but rather a collection of individual site-specific features that together are considered integral to wilderness character.

Threats to this quality result primarily from direct human actions (e.g., looting or vandalism) and indirect human disturbances (e.g., camping or trail use) that create unintended adverse effects. Although such damage is often associated with visitor use, other management activities (e.g., fire suppression activities or trail work) could also inadvertently contribute to disturbance. Natural processes also contribute to deterioration in the condition of features over time if there is no intervention.

The Other Features of Value Quality is explored through one monitoring question and two indicators, where use of at least one indicator is required.

MONITORING QUESTION: What are the trends in the unique features that are tangible and integral to wilderness character?

This monitoring question addresses the trend in the condition of tangible features that are integral to wilderness character (e.g., those features that help define the meaning and significance of the area). At this time, there is no standardized process or required criteria for making determinations about integral features. Parks are responsible for making this determination based on the specific context of both the wilderness area and the features within.

This monitoring question emphasizes the physical condition of identified features - the values associated with the features are not directly addressed in the WCM framework. Values and other intangible aspects of these features can be explored in the Wilderness Character Narrative to ensure specific linkages between features, values, and wilderness character are identified and documented.

While it is anticipated that measure trends in this quality may often be stable or declining, projects to improve the condition of features (e.g., successfully removing graffiti from an integral pictograph panel) could lead to an improving trend in this quality.

IF SELECTED INDICATOR IS: Deterioration or loss of integral cultural features

Cultural resources tell the human story of a place, representing the historical, cultural, social, and spiritual values embedded in landscapes now managed as wilderness and may be tied to the cultural identity of traditionally associated peoples. This indicator tracks the physical status and condition of cultural resources (known here as ‘cultural features’) that are integral to the wilderness character, including archeological resources, cultural landscapes, ethnographic resources (including sacred sites and traditional cultural properties), and historic (and precontact) structures.



To help determine which cultural features are integral to wilderness character, several considerations should be examined first:

1. For structures and installations, refer to the “Identifying Cultural Resources that Contribute to Wilderness Character” section in NPS Reference Manual 41’s [*Cultural Resources in Wilderness: Guidance for Considering and Managing Historic Structures and Installations*](#).
 - a. See guidance regarding the two-step analysis, first determining what “contributes” to wilderness character (i.e., what is integral?) and second determining what is “necessary.”
2. For all other cultural feature types, consider:
 - a. Is the baseline information provided in the Cultural Resource Inventory System accurate and reliable?
 - b. Is the feature listed on the National Register or recognized as a priority heritage asset (for example, identified as significant in an agency plan)?
 - c. Does this site/feature/landscape represent a variety of cultural values? For example, archeology site that is also part of documented cultural landscape and is identified as an ethnographic resource.

Comprehensively monitoring all integral cultural features located within wilderness is unachievable. In most cases, a representative sample of important, relevant, and specific integral cultural features will be addressed in this indicator. This curated selection represents a larger suite of integral cultural resources present in the wilderness area and does not diminish or dismiss those resources not included in the representative sample. Parks should document the rationale for their selection process in the Wilderness Character Building Blocks Report.



To identify a representative sample of integral cultural features, consider the variety of available resources. Begin with primary resources created by the park’s Cultural Resource Division:

- Cultural Resource Inventory System (CRIS) Records:
 - Archeological Resources
 - Cultural Landscapes
 - Historic Structures

- Ethnographic Resources
- National Register, World Heritage Site, and other nominations
- Historic Resource Study
- Archeological Overview, Assessment, or Research Design, Archeology Management Plans
- Ethnographic Overview and Assessment, Ethnographic Resource Study, Traditional Land Use Study
- Cultural Landscapes Inventory
- NPS Cultural Resource GIS Geodatabase and Park Resource Base Maps

Other park resources developed outside of the Cultural Resource Division will also be helpful. Questions to further help guide the park in identifying integral cultural features include:

- Does the park have a Wilderness Stewardship Plan or other management direction that may offer insight on how integral cultural features are determined?
- Does the park's wilderness legislation (for designated wilderness areas) specifically reference tangible cultural features? For parks managing 'other categories of wilderness', does the Wilderness Eligibility Assessment or Wilderness Study address integral cultural features?
- Do the park purpose, significance, and fundamental resources and values statements (like in the park Foundation document) note important cultural themes and the tangible features of cultural resources that represent them?
- Do the park's cultural resource baseline documents identify tangible cultural features that should have their relationship to wilderness character described?
- Is there scholarly or scientific place-based evidence to help evaluate whether specific cultural features contribute to wilderness character in the park?
- Is there Traditional Ecological Knowledge (TEK) that supports the core values of both traditional systems and the concept of wilderness? TEK is the system of experiential knowledge gained by continual observation and transmitted among members of a community.

In the absence of complete cultural resource baseline documents, parks should convene an interdisciplinary team that includes the various cultural resource professionals to discuss ways of addressing this indicator that recognizes data needs:

- If the park has a Cultural Resource Stewardship Assessment (CRSA), use the tables or report to facilitate a discussion about cultural resources within the wilderness area. What sites, features, or values are documented in the wilderness area? How do these resources relate to wilderness character? What percentage of the wilderness has had reconnaissance inventory done?
 - If a CRSA has not been completed, the assessment and guidance for the assessment may still be used to coalesce information and outline an approach for cultural resource management in wilderness.
- Are there known cultural resources that are in highly dynamic landscapes or with other known threats that require frequent monitoring as identified in CRIS or core treatment documents?

- Was wilderness designation pursued, in part, to help protect a specific cultural feature?
- Does the identified feature help bridge cultural values with complementary wilderness character values (including biophysical, experiential, and symbolic meanings)?
- What wilderness character concepts connect to cultural resources or features?
- What are the park's wilderness stewardship priorities that might relate to cultural resources?
- Does the cultural feature represent the traditional homelands of historically or traditionally associated groups, including both indigenous and non-indigenous people?
 - Proactive and thoughtful collaboration with members of these groups is important to ensure values are not misrepresented or based on assumptions.
- Have affiliated or associated groups identified features that require focused stewardship?

IF SELECTED INDICATOR IS: Deterioration or loss of other integral site-specific features of value

This indicator captures the condition of site-specific features, other than cultural resources, determined to be integral to wilderness character. Intended to provide flexibility for parks to use locally relevant context, this indicator addresses trends in certain natural or other features that may be iconic to a specific wilderness area. Measures for this indicator can address ecological, geological, scientific, educational, and scenic features.

For most parks, comprehensively monitoring all other site-specific features located within wilderness is untenable - and, not all such features may be identified as integral to wilderness character. In most cases, a representative sample of important, relevant, and specific features will be addressed in this quality. This curated selection represents a larger suite of features present in the wilderness area and does not diminish or dismiss their existence. Parks should document the rationale for their selection process in the Wilderness Character Building Blocks Report.



To help determine which non-cultural features are integral to wilderness character, review existing documents and resources first. If unavailable, explore questions that can be posed to an interdisciplinary team.

Existing documents and resources:

- Does the park have a Wilderness Stewardship Plan or other management direction that may offer insight on how integral features are determined?
- Does the park's wilderness legislation (for designated wilderness areas) specifically reference tangible features? For parks managing 'other categories of wilderness', does the Wilderness Eligibility Assessment or Wilderness Study address tangible features?
- Does the park purpose, significance, and fundamental resources and values statements (like in the park Foundation document) note important features? Features referenced here, that are also present in wilderness, should be further considered.

- Does the park have special resource designations, like Biosphere Reserves, National Natural Landmarks, National Trails, and Wild and Scenic Rivers? If part or all of such a designation is located within wilderness, these areas should be further considered.
- Is there scholarly or scientific place-based evidence to help evaluate whether specific features contribute to wilderness character in the park?

In the absence of formal documentation, parks should convene an interdisciplinary team to brainstorm ideas:

- What is the first feature that comes to mind when the team thinks about the wilderness area? What is it about this feature that strikes you? Does this relate to wilderness character in some way?
- What does it mean to identify a feature that is integral to wilderness character for this park? What are the park's wilderness stewardship priorities that might relate non-cultural aspects of the Other Features of Value Quality?
- Was wilderness designation pursued, in part, to help protect a specific feature?
 - Does the description and significance of the feature share language similarities with wilderness character concepts (including biophysical, experiential, and symbolic meanings)?
 - Are there conceivable sources of potential deterioration or loss that this feature should be protected from (including loss of designation status, loss of physical material, etc.)?
 - If the feature has no real threats, it should be excluded from consideration.



MEASURES

[Measure examples](#) and [measure idea templates](#) for the two indicators above are available for review and optional use.

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Appendix A: Law and NPS Policy Framework for Wilderness Character Monitoring

The following references serve as the primary law and policy framework for WCM in the NPS:

[Wilderness Act \(1964\)](#)

The Wilderness Act established the National Wilderness Preservation System “for the protection of these areas, the preservation of their wilderness character” (Section 2(a)). Congress (United States Congress 1983) and legal scholars (McCloskey 1999; Rohlf and Honnold 1988) have confirmed that the primary affirmative legal mandate is to preserve the wilderness character of all areas designated by Congress as wilderness.

The Wilderness Act further affirms that “each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character” (Section 4(b)). Zahniser (1962), principal author of the Wilderness Act, emphasized this when he wrote, “The purpose of the Wilderness Act is to preserve the wilderness character of the areas to be included in the wilderness system, not to establish any particular use.”

[National Park Service Management Policies 2006, Chapter 6](#)

NPS Management Policies 2006, Chapter 6: Wilderness Preservation and Management, state that, “[t]he purpose of wilderness in the national parks includes the preservation of wilderness character.”

NPS Management Policies are also explicit about wilderness character monitoring. Section 6.3.6.2 states: “In every park containing wilderness, the conditions and long-term trends of wilderness resources will be monitored to identify the need for or effects of management actions. The purpose of this monitoring will be to ensure that management actions and visitor impacts on wilderness resources and character do not exceed standards and conditions established in an approved park plan. As appropriate, wilderness monitoring programs may assess physical, biological, and cultural resources and social impacts. Monitoring programs may also need to assess potential problems that may originate outside the wilderness to determine the nature, magnitude, and probable source of those impacts.”

[National Park Service Director’s Order 41: Wilderness Stewardship \(DO41\)](#)

Agency policy contained within DO41 also supports wilderness character monitoring and establishes that Superintendents are responsible for “protect[ing] wilderness character by adhering to the Wilderness Act and NPS guidance documents;” and further, they must “ensure wilderness character baseline is established and trends monitored.”

Furthermore, DO41 specifically speaks to wilderness character monitoring in Section 6.2: “Wilderness parks will conduct a wilderness character assessment, which includes identifying what should be measured, establishing baseline data, and conducting monitoring of trends. Each measure should be relevant to tracking change in an attribute or element of the park’s

wilderness character, or relevant to tracking a threat to this attribute. Once a baseline is established, tracking change and reporting on the trend in wilderness character should generally occur every five years.”

[National Park Service Reference Manual 41: Wilderness Stewardship \(RM41\)](#)

RM41 offers guidance and resources to complement the policy listed above, aiding NPS staff responsible for managing and preserving wilderness character and the wilderness resource throughout the National Park System.

References

McCloskey, M. 1999 “Changing Views of What the Wilderness System Is All About.” *Denver University Law Review* 76:369–381.

Rohlf, D., and D. L. Honnold 1988 “Managing the Balances of Nature: The Legal Framework of Wilderness Management.” *Ecology Law Quarterly* 15:249–279.

Zahniser, H. 1962 Hearings before the Subcommittee on Public Lands of the Committee on Interior Affairs, House of Representatives, 87th Congress, 2nd session, 7–11 May, serial no. 12, part IV.

Appendix B: NPS Modifications to *Keeping It Wild 2*

Keeping It Wild 2 is a primary reference for wilderness character monitoring throughout the National Wilderness Preservation System, including in NPS wilderness areas. Since its publication in 2015, many lessons have been learned as parks increasingly participate in the WCM process. As such, the NPS has made selective modifications to aspects of this interagency guidance to better reflect our current understanding of effective WCM that better addresses the NPS primary purpose of WCM, which is to serve park-identified wilderness stewardship needs.

The following are the major modifications this Guide makes relative to guidance in *KIW2*:

Topic: Primary purpose of WCM

KIW2: While a primary purpose of WCM is not explicitly stated, the WCM framework presented simultaneously emphasizes local relevance and national/interagency consistency.

NPS WCM Technical Guide: The primary purpose of WCM is to serve park-identified wilderness stewardship needs.

Why? While WCM can potentially address multiple purposes, the NPS believes that multiple purposes must be prioritized, with a primary purpose taking precedence that may diminish the strength of lower-ranked purposes. In order for the WCM process to be useful to parks, additional flexibilities in an otherwise national/interagency-consistent framework were instituted.

Topic: Other Features of Value Quality

KIW2: For WCM purposes, the Other Features of Value Quality is optional.

NPS WCM Technical Guide: For WCM purposes, the Other Features of Value Quality is required. Parks must use at least one of the two indicators associated with this quality.

Why? NPS wilderness areas are rich with historical and other features of value and representing these features in monitoring is an important and integral element of wilderness character preservation.

Topic: Status of indicators

KIW2: All indicators listed (except for those in the Other Features of Value) are required to be monitored.

NPS WCM Technical Guide: Not all indicators are required to be monitored:

1. Optional indicator: 'Actions not authorized by the federal land manager that intentionally manipulate the biophysical environment' (Untrammelled Quality)
2. Optional indicator: 'Presence of inholdings' (Undeveloped Quality)
3. Optional indicator: 'Remoteness from sights and sounds of human activity outside of wilderness' (Solitude or Primitive and Unconfined Recreation Quality)

4. At least two measures for the Natural Quality must be selected (addressing a minimum of two of the four indicators for this quality).
5. At least one measure for the Other Features of Value Quality must be selected (addressing a minimum of one of the two indicators for this quality).

Why? For the NPS, WCM must be primarily useful to parks. With over 80 percent of all NPS lands managed as wilderness, there is tremendous diversity in the wilderness character of NPS wilderness areas. Instituting more WCM flexibilities allows parks to develop a more context-specific WCM framework that yields useful and relevant insights about a particular park's wilderness character. The indicators now deemed optional are those with the greatest potential for variation and implementation challenges in the NPS. Because these modifications will diminish the interagency consistency of the WCM framework outlined in KIW2, exercising the NPS-specific modifications to indicators should be done only when the flexibility is really needed to improve the usefulness of WCM at the park level.

Topic: Site-specific measures

KIW2: Use of site-specific measures is strongly discouraged.

NPS WCM Technical Guide: The NPS permits selective use of site-specific measures (i.e. measures that do not represent the entire wilderness area).

Why? Due to practical constraints (budget, capacity, time, etc.) and wilderness stewardship priorities, some measures may need geographic restrictions to be successfully implemented and yield useful insights for management implications. Also, NPS wilderness stewardship planning policies support the concept of zoning which may warrant applying certain measures to management zones or units, rather than the entire wilderness area.

Topic: Distinctions between trend and change in measure values

KIW2: Trend determinations are made by comparing the current reported measure value to the baseline measure value and can be determined so long as there are at least two data points. There is no distinction between 'trend' and 'change'.

NPS WCM Technical Guide: Trend and change are recognized as separate concepts, based on the number of available data points for the current reported measure value. Both yield helpful insights for condition comparisons in wilderness character.

“Trend is officially determined by comparing the current reported measure value to the baseline measure value if the current reported measure value includes a minimum of five data points. Trend is determined by the measure's corresponding threshold for meaningful change to help interpret the comparison and conclude if the trend is improving, stable, or declining. Absent the availability of five data points, change (rather than trend) between current and baseline measure values can still be discussed and documented.”

“Change is informally determined by comparing the 'reported measure value' and the 'baseline measure value' for measures with fewer than five data points informing the current

‘reported measure value.’ Like ‘trend’, interpreting change should be informed by the measure’s corresponding ‘threshold for meaningful change’ to help interpret the comparison. Recognizing a ‘change’ in condition prompts managers to consider the cause and effects of the change while awaiting enough data points to make formal ‘trend’ conclusions.”

Why? The Guide’s distinction between trend and change better complements other resource monitoring efforts that delay official trend determinations until larger datasets are available. This delay helps managers apply appropriate levels of interpretation to observations of shorter-term change (that may or may not indicate meaningful shifts in the measure) compared to more substantial trend determinations.

Topic: Thresholds for meaningful change

KIW2: Measure-specific thresholds are referenced as ‘thresholds for significant change’. This phrase is not defined but implies the use of statistical reasoning. Furthermore, KIW2 suggests “for measures that have at least five data points, simple linear regression may be used to determine trend.”

NPS WCM Technical Guide: ‘Threshold for meaningful change’ is intentionally used and replaces other threshold terms referenced in KIW2. A ‘threshold for meaningful change’ is defined as:

“A quantitative and/or qualitative set of parameters that interpret change in the current ‘reported measure value’ compared to the ‘baseline measure value’. This comparison distinguishes minor/reasonable change (within identified thresholds) from meaningful change (exceeding the identified threshold, which can be positive or negative). The outcome of this change is used to determine ‘trend’.”

Why? The Guide’s rephrasing of the threshold term and the assigned definition better demonstrate the importance and complexity of using thresholds in WCM. The process of determining thresholds for meaningful change is inherently subjective because it typically depends on place-based professional judgment. There is no ‘objective’ process that can make this decision for managers. The complexity, nuance, and context present in a wilderness area must all be accounted for when determining thresholds for meaningful change. This means that use of statistical reasoning (and linear regression) *may* be an appropriate threshold but should only be used if determined to be the best option for a specific measure. Parks should review the ‘Thresholds for meaningful change’ component within the “Components Described for Each Measure” section of this Guide before assigning thresholds.

Topic: Addressing historic structures and historic installations in the Undeveloped Quality

KIW2: Historic structures and installations negatively affect the Undeveloped Quality, except for features constructed by indigenous peoples prior to modern settlement.

NPS WCM Technical Guide: For WCM purposes, only structures and installations (also known as other developed cultural assets) that were created after the year the area was first managed to preserve wilderness character will be considered in this quality.

Why? The Undeveloped Quality was conceived of to better understand some components of the wilderness character concept. This concept is only applied to NPS lands that are managed to preserve wilderness character according to NPS policy or the Wilderness Act. For structures and installations that existed prior to this wilderness character lens being applicable, those developments are not relevant for WCM purposes.

Topic: Human attribution in the Natural Quality

KIW2: WCM should only monitor effects to the biophysical environment that are primarily human-caused.

NPS WCM Technical Guide: Parks should identify effects to the biophysical environment that include but may not be primarily attributed to human causes.

Why? There are many factors that contribute to outcomes ultimately observed in impacts to the biophysical environment. If limited only to those effects that humans are known to primarily contribute to, parks may miss opportunities to track change in other effects that are equally impactful to the vitality of the Natural Quality. So long as humans contribute to the effect being monitored, regardless of other contributing factors, a broad array of measure topics are appropriate for the Natural Quality. Measures that address effects of climate change are appropriate for NPS WCM. This may include measures previously referenced as inappropriate (in KIW2) due to concerns about reference states and attribution, like sea level rise and glacial mass. Parks should review guidance in the Natural Quality chapter of this Guide before selecting measures for this quality.

Appendix C: List of Supplemental Wilderness Character Monitoring Tools Linked in this Guide

[Example measures](#)

Measures give a sense of how a specific park interpreted and implemented the intent of a specific indicator through the creation of a park-specific measure.

[Measure idea templates](#)

Templates provide a modifiable structure for parks interested in using one or more commonly used measures. These templates are optional.

[NPS Status Report for In-Progress WCM Baseline Assessment Template](#)

Template gives parks with WCM data gaps a structure to document their progress and help keep the WCM process moving forward. While optional, parks are encouraged to use this template.

[Wilderness Character Building Blocks Report Template](#)

Template to document both the Wilderness Basics and Wilderness Character Baseline Assessment. While optional, parks are encouraged to use this template.

[WCM Five-Year Reporting Summary Template](#)

Template to document measure values and changes or trend for five-year reporting intervals of WCM. The summary can be appended to the Wilderness Character Building Blocks Report for co-reference. While optional, parks are encouraged to use this template.