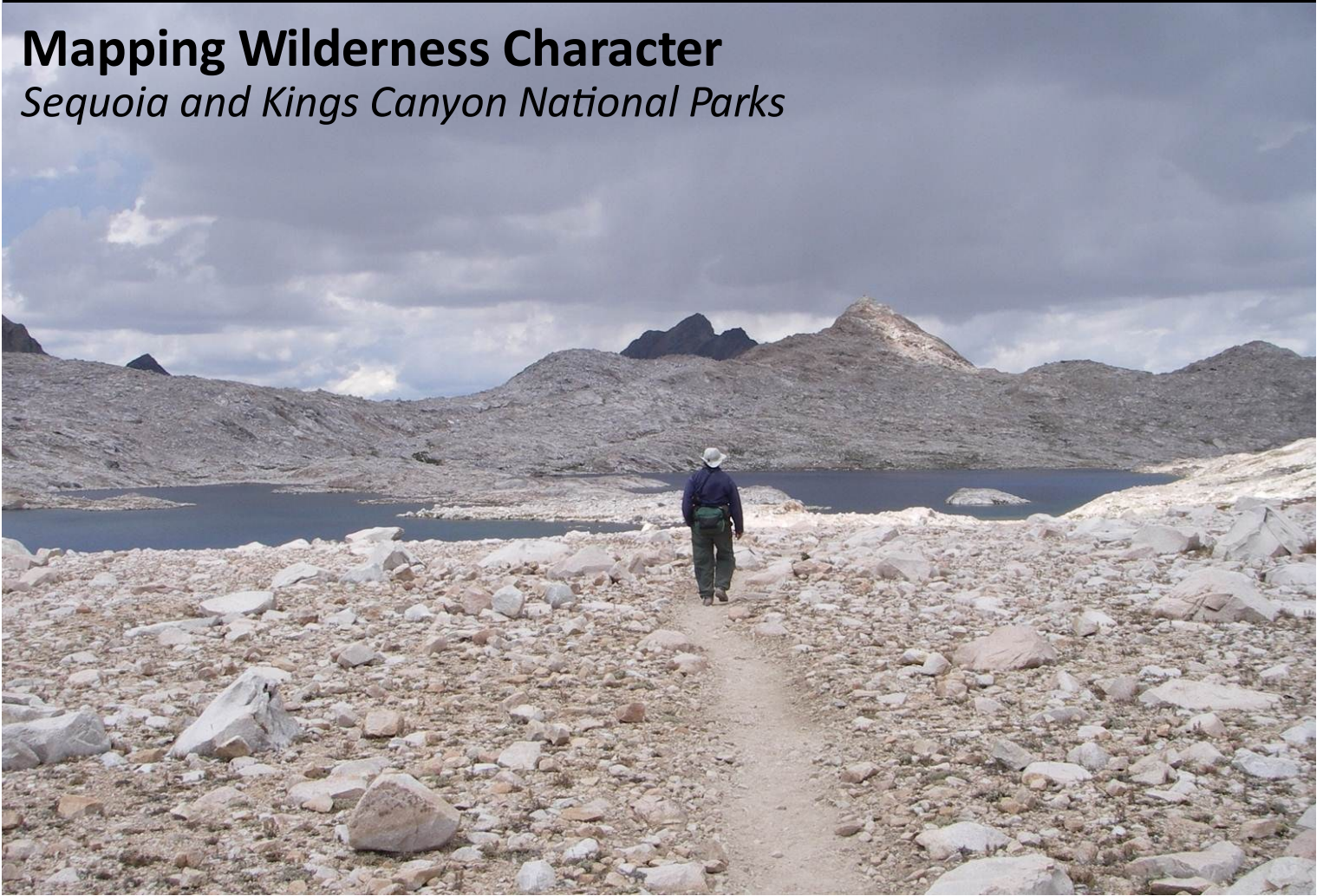




Mapping Wilderness Character

Sequoia and Kings Canyon National Parks



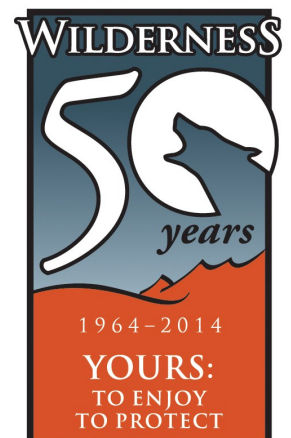
Hiker along John Muir Trail in northern Kings Canyon National Park. Photo: Linda Mutch

"...to know the wilderness is to know a profound humility, to recognize one's littleness, to sense dependence and interdependence, indebtedness, and responsibility."

--Howard Zahniser, *The Need for Wilderness*, In: *The Living Wilderness* (Winter to Spring issue), 1956

This and other writings of Zahniser strongly reinforce the idea that wilderness character is the capacity of an area to elicit humility, awaken a sense of relationship and interconnectedness with the community of life, and evoke a feeling of restraint and obligation toward nature (Landres et al. 2008). People have held various perspectives of wilderness over time. Wilderness may be described as the combination of biophysical, experiential, and symbolic ideals that distinguishes wilderness from other lands. These ideals combine to form a complex and subtle set of relationships among the land, its management, and its users.

At nearly 110 million acres, designated wilderness in the United States receives the highest level of Federal protection from anthropogenic development. Landres et al. (2005) applied the legal definition of wilderness from the Wilderness Act of 1964 to identify four tangible qualities of wilderness that make the idealized description of wilderness character relevant and practical to wilderness stewardship. Indicators and measures of these four qualities can be monitored to determine if wilderness character is improving, declining, or staying stable.



Why Do A Wilderness Character Map?

Staff from Sequoia and Kings Canyon National Parks (SEKI) and two scientists from the Forest Service Aldo Leopold Wilderness Research Institute worked together to map the estimated current condition of wilderness character across the parks (Tricker et al. 2014) and achieve the following objectives:

- Show the current condition of wilderness character and how it varies across SEKI's 837,806 acres of the wilderness.
- Provide a measurement baseline from which future monitoring can show trends and changes in wilderness character over time.
- Allow the parks to analyze the potential impacts of different management actions on wilderness character, such as those included in the forthcoming SEKI Wilderness Stewardship Plan.
- Identify areas within the wilderness where resource managers should make an effort to control or mitigate impacts. These efforts may include monitoring conditions, establishing thresholds, or taking direct action.
- Improve internal staff communication about wilderness, and improve external communication between the parks and the public on related issues.

1964 WILDERNESS ACT Section 2C

"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Maps as Tools: Wilderness character maps are not intended to portray the symbolic, intangible, spiritual, and experiential values of wilderness character that are unique to individual persons, locations, and moments. They are an informative tool that wilderness stewards can use to further refine the effectiveness of their efforts to "preserve the wilderness character" and perpetuate "the enduring resource of wilderness" (Public Law 88-577).



Sawtooth Pass, looking east, Sequoia National Park. Photo: Rick Cain

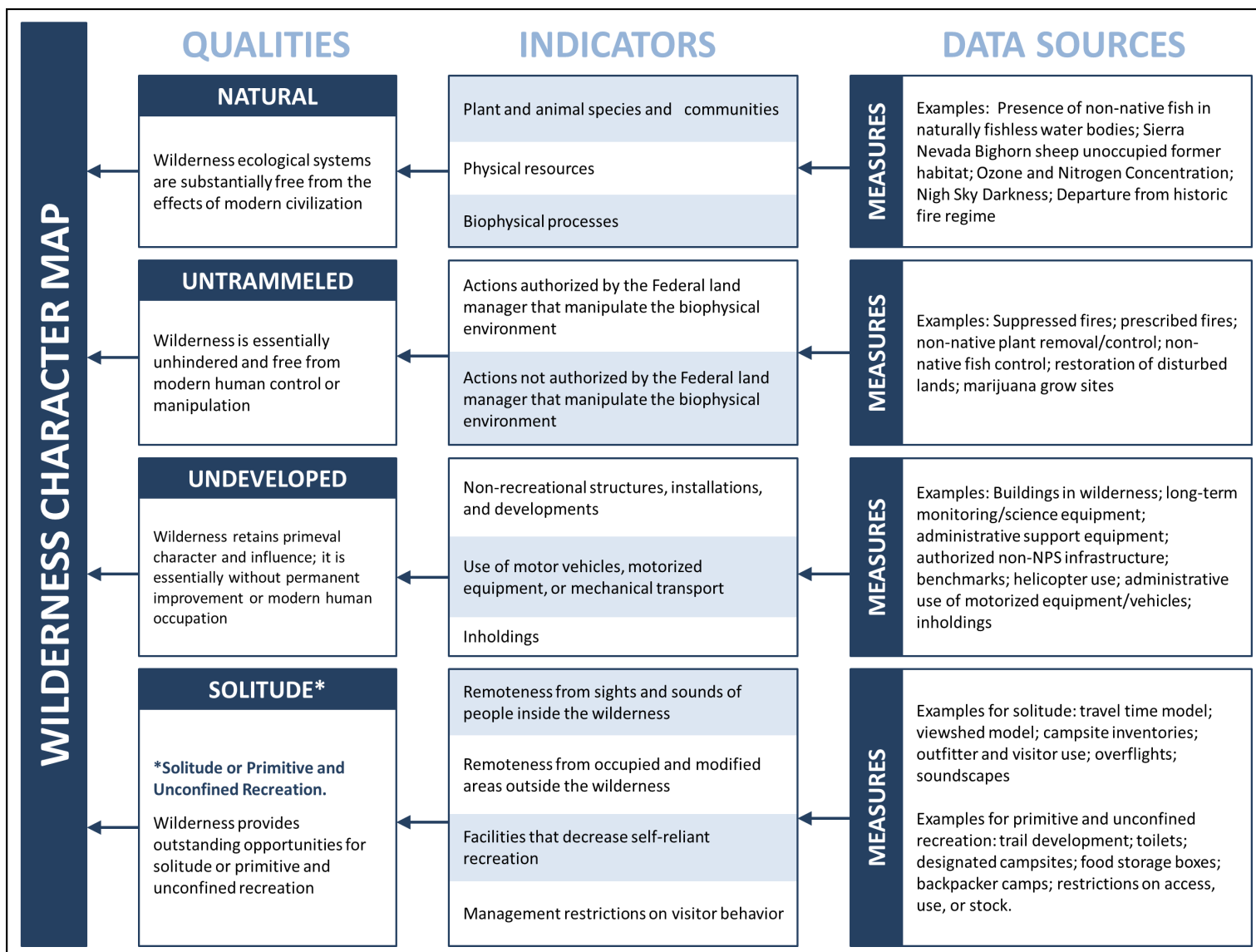


Figure 1: Flow chart for developing the wilderness character maps. Maps are developed at the level of indicators and qualities, and the quality maps are combined to produce the overall wilderness character map (adapted from Landres et al. 2008; Tricker et al. 2014).

How is a Wilderness Character Map Developed?

Framework: The interagency strategy for monitoring wilderness character, as described in Keeping It Wild (Landres et al. 2008), was used as the basis for applying the wilderness character mapping approach. Keeping It Wild, the interagency strategy for monitoring wilderness character identifies four qualities of wilderness character that apply uniquely to every wilderness: natural, untrammeled, undeveloped, and opportunities for solitude or a primitive and unconfined type of recreation (Landres et al. 2008). It also identifies a set of monitoring questions and indicators that provide the framework for a wilderness character monitoring program.

The mapping project used techniques first developed and applied at the Death Valley NP wilderness (Carver et al. 2013) and a Geographic Information System to spatially describe and assess the quality of SEKI wilderness character. SEKI staff identified a set of measures for each indicator to capture negative impacts on wilderness, including features, conditions, and actions that degrade the qualities of wilderness character.

Data: Project participants used spatial 79 datasets to measure and delineate wilderness character. Variation in the scale, accuracy, and completeness in the data placed limitations on how the map products were developed. The datasets were processed into measures, i.e. raw data were converted into a project-specific format. Measures were assigned under an appropriate indicator and weighted within each indicator. **Figure 1** illustrates the process of using data sources to produce measures for the indicators under each quality of wilderness character.

Analysis: The weighted measures for each indicator were added together and maps were developed at the level of indicator and quality. The team then combined (or added together) the four different maps for each quality to produce a composite wilderness character map for the parks' wilderness. Because all four qualities are equally important, the four qualities were added together without weights.

The Wilderness Character Map

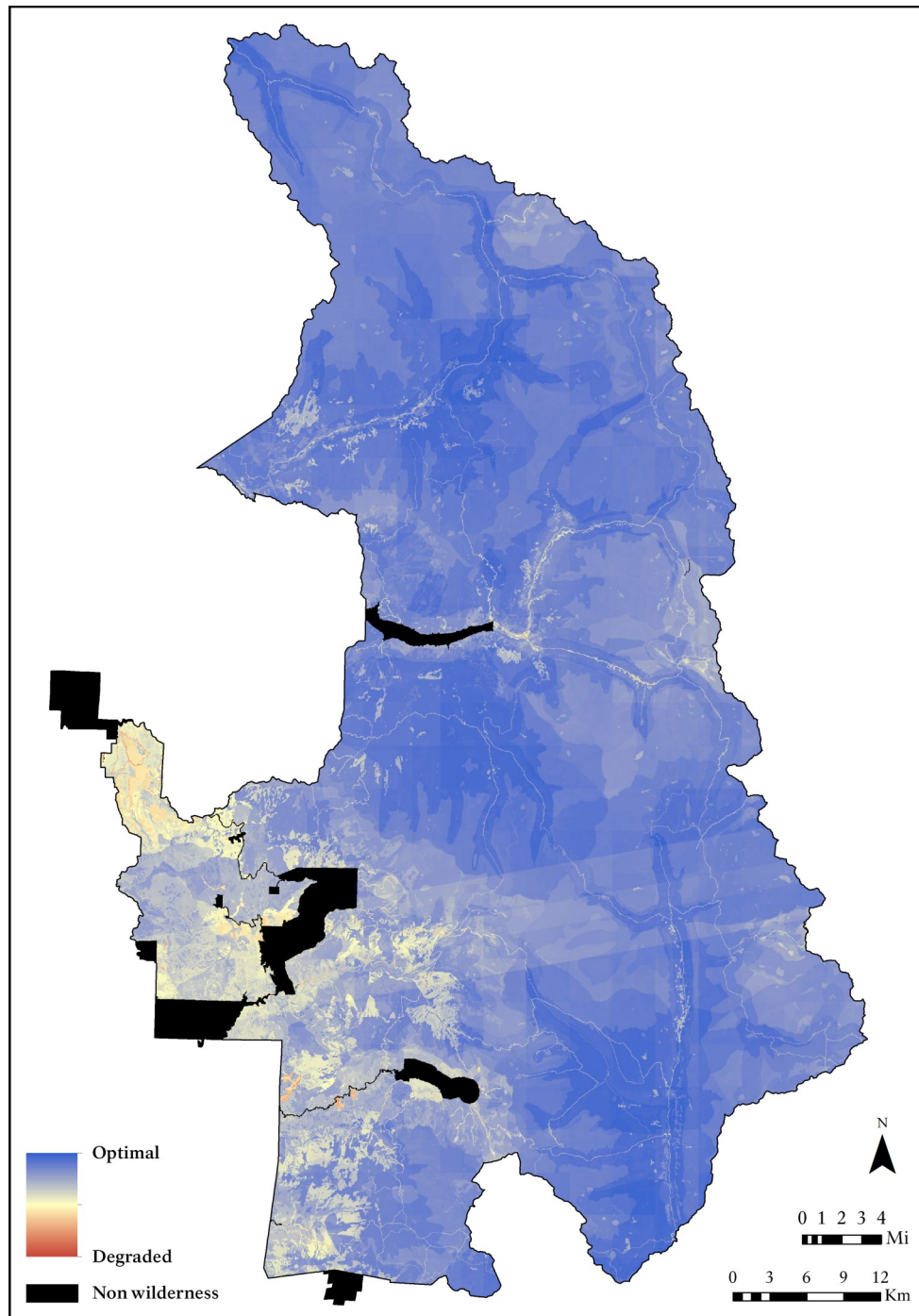


Figure 2. Map representing wilderness character for SEKI. Blue depicts optimal quality; red depicts degraded quality.

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Results: The qualities of wilderness character were added together to produce a single map of overall wilderness character in SEKI (Figure 2). Interpreting this map requires a clear understanding of the methods and data used. The degraded areas in the overall wilderness character map were generated through the analysis of a multitude of data: to understand why these areas are degraded, one must “drill down” into the individual qualities, indicators, and measures.

Concerns: A major concern of many GIS analyses is the tendency for end-users to ascribe false levels of reliability and precision to the maps because they look accurate. These map products are an estimate of selected measures of wilderness character and their spatial variability and pattern. Additionally, wilderness researchers and users may debate the merits of even attempting to map wilderness character. Some suggest that quantification of wilderness character does not reflect the personal impact of wilderness (e.g., Watson 2004), while others point to the need to develop indicators that can be used to aid monitoring and management (e.g., Landres 2004).

Questions?

We encourage those interested in understanding what most influenced the spatial patterns of degradation to explore the report (Tricker et al. 2014). Also visit: www.nps.gov/seki