

**NPS Interim Technical Guidance on Defining Meaningful Desired Conditions
for Natural Resources
APPENDIX A**

What's in a name? Exploring Perspectives of Desired Conditions

Introduction

Desired conditions are used as measurable points for evaluation of the status of natural resources in public land management. Yet, even within one agency, such as the NPS, there is confusion about the scope of the DC. For example, the NPS defines desired conditions as:

“a park’s natural and cultural resource conditions that the NPS aspires to achieve and maintain over time, and the conditions necessary for visitors to understand, enjoy, and appreciate those resources. These conditions are identified through a park’s planning process.” [1]

But the Department of Interior provides a more detailed definition:

The qualitative or quantitative natural resource attributes of an area that are identified through the planning process as the desired outcome of management. The description of desired condition includes measurable objectives for the identified attributes, including physical, chemical, hydrologic, and biologic attributes. The desired condition for a particular area may or may not be the attributes that represent natural conditions or indicate that natural processes predominate in the area. (2007-2011 DOI Strategic Plan)

Also, Congress, in the 1978 National Parks and Recreation Act (16 USC 1a-7) directs NPS to include measures for the preservation of resources in General Management Plans. These measures would be interpreted as desired conditions. But NPS Planning guidance characterizes the “desired resource conditions established by the GMP are usually broad, qualitative goals rather than measurable objectives.” This guidance states that GMPs contain goals, and provides no justification for separating indicators and standards from the goal statement in the GMP. This obviously leads to confusion over what the desired condition concept is and what use it has to managers.

The desired condition is an important and valuable component of planning, analysis and evaluation of natural resources. NPS does not apply this concept in a meaningful way. The dichotomies in perception shown above have likely contributed to the weak track record for the development of science-informed and measurable desired conditions in NPS plans. The goal of this paper is to provide an understanding and subsequent application of the DC concept, by providing background into the DC terminology and uses.

Background

The Desired Condition (DC) concept satisfied the need of managers of multiple-use agencies such as the United States Forest Service (USFS) to establish management goals and objectives that accommodate biological, commercial, recreation and community needs [2]. DCs also are seen as a remedy to criticisms that environmental managers were not establishing “clear and operationally defined goals [3]. The DC concept is now applied broadly across other federal and state bureaus, with DCs serving as performance standards for managers to assess programmatic success. Federal land management agencies report on current condition of resources based on a clear desired condition [4]. Leaders in the effort to measure the success of conservation actions, such as The Nature Conservancy and the World Wildlife Fund have adopted the DC concept through the use of measurable conservation targets [5]. Yet, in practice, one finds little consistency in desired conditions; either in terminology, purpose or level of detail.

Terms

Various terms have been applied to the DFC concept, such as desired state or desired future states [6], goals [7], threshold values (USFS), defining characteristics and ecological targets [8]. Also, extensions of the concept have been recommended, such as desired future behaviors or trajectories [9] and desired future dynamics [10] as ways to capture ecological realities. Naiman, et. al. approached the concept broadly as the “shared socio-environmental vision relating to short and long term socio-environmental endpoints”, and that the desired condition concept “aids in communication and is effective for education about diverse cultural beliefs and values” of a resource [11]. At the other end of the spectrum, Nute, et. al. [12], applied hierarchical approaches to DC development, and associated the desired future condition with a single variable corresponding to some observable situation in the world. That is, a measure associated with each indicator developed for a resource. Recent discussions on climate change and national parks simply used “desired futures,” perhaps speaking to the morbid hope that we will have, at a minimum, some future at all.

Definitions

Desired Conditions are similar to concepts such as “sustainability” and “ecosystem management” in that numerous definitions representing a range of interests can be found (Table 1).

Descriptions of the Essential Ecological Characteristics should desired goals be ultimately achieved [13]
The qualities of an ecosystem or its components that an organization seeks to develop through decisions and action [7]
The statement of Desired Conditions is the main plan component that describes the ecological, economic and social attributes characterizing outcomes of land management. The description of Desired Conditions may be organized around broad themes that carry throughout other sections of the plan. Additionally, the scientific basis for the Desired

Conditions, such as historic range of variability, should be included or referenced in the plan. USFS Guide for Planning Under the 2005 Planning Rule
Timeless, yet potentially measurable descriptions of conditions to be achieved in the future (physical/biological conditions, natural processes, wilderness experiences). Answers “What will result from effective management and proper land use?”
“...a description of the intention a community has for its lands and waters.” [7]
“... represent a team’s aspirations, the vision they have for what their efforts can bring.” [7]
“... an explicit description of the physical and biological characteristics of aquatic and riparian environments believed to be necessary to meet fish, aquatic ecosystems and riparian ecosystem objectives.” Forest Ecosystem Management
“... what we want a landscape to be like at some future date. It can reflect an idealized, sustainable system or a modified one. There can be more than one option for a desired future condition, but generally the aim is to envisage a future pattern and landscape structure that is more desirable for sustaining ecosystem functioning. This can be described in terms of the amounts and locations of the landscape structures that should be in the landscape over given periods of time, perhaps with special core areas for specific conservation management also identified.” [14]
A goal statement containing a single variable measuring some observable state or flow of the system being managed. [12]
A detailed characterization of resources after goals have been achieved. NPS 2008

Table 1 Definitions of Desired (Future) Condition

Analysis

Given the variety of terms and meanings that have been applied to the DC concept, an analysis of the commonly used “Desired Future Condition Statement” can add context to ensuing steps to developing target values and statements.

“Desired” infers a value-based goal, and the willingness to commit resources to achieve it. We cannot know everything about the historic range of conditions or the factors that created and maintained that condition. Also, we do not know the extent of human influences on resources, or what distinguishes “natural” or “managed” resources. We apply perceived gradients of these standards, and with climate change, biological invasions, human population growth, there really are no natural resources that function independently of human actions and values (McKibben 1989). We are left with little option than to manage resources for what we ought to manage them towards, based on a combination of values and resource limits.

“Future” infers the emphasis on the relationship to long term, higher level mission and goals, not short term project objectives. Managers must take the future into account when dealing with dynamic systems [15]. As DC are seen as long-term visions, and not about short-term restrictions to resource condition it should be emphasized that managers avoid “extrapolation of the moment” i.e., those aspects of

the present influence our predictions of the future [15]. Early efforts at DC by the Forest Service were criticized, primarily because efforts were shortsighted visions of what people wanted from ecosystems (e.g., timber), and not what the systems could sustainably produce over time [9]. A 25 -50 year horizon for a desired condition will support the DC as a tool for strategic planning and management, and curb reactionary responses to issues.

“Condition” infers the articulated state of resources (with regard to extent, structure, composition and behavior), interactions within and among resources and related processes. This too is value-based, as this “state” whether good or bad, improving or declining, has to be evaluated with a value-based metric, such as sustainability, integrity, health or stability.

“Statement” infers a descriptive articulation or clear expression through a narrative. It lends to the holistic nature of the resource, and is an effective communication tool. Tables of indicator target measures should complement statements, but not be used in lieu of statements. If we only manage for a suite of target measures chances increase that we lose sight of our broader resource goals. Likewise, generalized cartoons will not suffice as a measurable desired condition. Ignoring the complexity of natural resources will lead to an outcome of simplified resources, which is unacceptable.

Desired Future Condition statements have been described and applied across a specificity gradient from visions, or goals, to objectives. National Park Service desired conditions range from broad goal statements, and not necessarily limited to resources, to quantifiable ranges of target measures for specific resources. For example, Olympic National Park’s General Management Plan describes the desired condition for Ecosystem Management, which is a management concept not a resource. An excerpt from the OLYM GMP states:

- Through partnerships and cooperative agreements, the park staff works with other Olympic Peninsula land and marine managers to accomplish mutual objectives for providing wildlife corridors, protecting biodiversity and key habitats, etc.
- In collaboration with landowners inside and outside the park, viewsheds within and adjacent to the park are protected.
- The park provides benchmarks or “control” conditions for studies of ecosystem processes in (largely) unmanipulated landscapes, helping to determine the park’s own resource preservation goals and those of adjacent lands.
- Natural processes of ecosystem disturbance and change function unimpeded, and are altered only as needed to provide for visitor and staff safety and access, to protect park facilities in developed areas, and to maintain cultural landscapes.
- “Purification” services provided by park ecosystems are protected and maintained, thus helping to provide clean air and water for park resources and the surrounding area. Soil and water resources are free of contaminants.

- Ecosystems and habitats damaged by human activities or nonnative species are restored. Future development avoids sensitive habitats and dynamic areas prone to natural disturbances, if possible.

In a stand-alone technical report, for Biscayne Bay, the “desired condition” takes into account historical information about the ecosystem but is not necessarily equivalent to a pre-drainage state. The desired condition for the Western Bay Zone of Biscayne National Park is a range of salinities that is consistently estuarine for support of a productive and diverse benthic community based on seagrass. These conditions also support federally-listed endangered species, such as the American crocodile (*Crocodylus acutus*) and West Indian manatee (*Trichechus manatus*), and create productive nursery habitat that sustains local and regional (Florida Keys) fishery resources.

- Considering the needs of many native species, including the juvenile stages of crocodiles, gray snapper, seatrout, and pink shrimp, and populations of mojarras, pinfish, eastern oyster, and widgeongrass, the following salinity characteristics are required:
- At no time should measured salinities exceed 30 ppt. This will be particularly critical to achieve in the dry season, from November to June.
- From March through August (late dry season - early wet season), average monthly salinities should range between 15-25 ppt in the Western Bay Zone.
- In the late wet season (September-October), the Coastal Mangrove Zone should be oligohaline (0-5 ppt), and the Western Bay Zone should average less than 20 ppt.
- Salinity changes should be gradual and reflect changes in coastal inflows that approximate those of an unregulated, natural system.
- Flows that achieve these salinity targets will produce stable mesohaline conditions over the 10,000 acre nearshore bay area of Biscayne National Park.

The US Forest Service has shifted from general qualitative statements in plans to more developed statements that include resource attributes, standards and guidelines [16]. Forest Service planning now develops hierarchical, qualitative statements as “desired conditions and trends,” and moves directly to program objectives [17]. Another approach is to develop broad strategic metrics and simply identify a number of desired trends within that strategic goal [18]. At the other end of the spectrum, DFCs developed for the Bent Creek Experimental Forest are fine tuned to target values such as “Coarse woody debris > 3.5 m³/ha.” and “# stand size classes >= 3” [19].

Conclusion

The NPS would benefit from an interpretation of a desired condition concept that provides the most value to managers and stakeholders. This interpretation should also reflect higher level goals and directives. The literature on goal setting and strategic planning leads to a conclusion that goals need to be evaluated through the

definition of measures. This all leads to the desired condition as a measurable extension of a goal that reflects the state of a resource after a goal is achieved.

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