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Stewardship of a Hidden Landscape

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Introduction

Karst landscapes occur in soluble rock types such as carbonates (limestone), evaporites (gypsum), and silicates (sandstone). Sinkholes, disappearing streams, and subterranean drainage, which can include caves, characterize these landscapes. It should be noted that not all caves are found in karst; lava tubes are examples of nonkarstic caves.

At the present time, there are eight national parks and monuments that were created because of the presence of a specific cave: Carlsbad Caverns National Park, Jewel Cave National Monument, Lehman Caves National Monument (now a part of Great Basin National Park), Mammoth Cave National Park, Oregon Caves National Monument, Russell Cave National Monument, Timpanogos Cave National Monument, and Wind Cave National Park. However, within the National Park system, 120 of the 388 units have caves and/or karst features. Over 3,900 caves have been located on 81 sites, and, an additional, 39 sites contain karst features (NPS 2005). With approximately 30% of the units of the national park system having caves and/or karst, these natural resources become a significant stewardship concern.

Barriers to cave and karst stewardship

The stewardship of caves is in many ways a matter of managing a hidden landscape. Often, karst surface features or caves are obscured by vegetation or are just not obvious. As an example, in desert environments sinking streams are typically ephemeral, existing only for short periods after storm events. In addition, management perceptions of the site can obscure the need for cave and/or karst stewardship. NPS units not established because of the presence of caves have management agendas focused on protecting those aspects for which they were established. Other barriers to stewardship exist on organizational, personal, and scientific levels (Wright 2004).

Accessibility is often a barrier to cave stewardship programs. Unlike surface environments, caves lack scenic overviews. Management cannot make use of flyovers or drive-bys for information-gathering purposes and study of the caves. In many cases, those directly responsible for managing caves lack the skills or desire to visit the caves.

Caves have long been viewed primarily as recreational resources, resulting in a significant organizational-based barrier to ecosystem-based stewardship. Recreational components of caving include sport caving (private groups) and adventure caving (tour groups). This aspect of management can often overshadow other uses and needs. Managing for ecosystem and habitat protection, as well as for a variety of scientific studies, can easily be overlooked. Exploration and mapping activities should be considered as scientific endeavors and managed within guidelines and standards designed for such endeavors.

The lack of scientific information is a significant barrier to developing high-quality cave and karst stewardship programs. Although cave and karst-based research is increasing,

extensive research activities are limited. In part, this is due to lack of funding and support from the academic and scientific communities (Wright 2004). Scientific input is becoming increasingly important in the development of management plans and policies that can hold up under legal challenges and public opinion (Mills et al. 2001).

Wright (2004) notes that organizational barriers also include the limited availability of funds, current workloads, lack of trained personnel, and agency practices. With the current lack of federal funding for natural resources protection and conservation efforts, it becomes critical that managers look beyond current agency constraints in developing effective cave and karst stewardship programs.

Cave and karst stewardship considerations

As noted earlier, cave and karst stewardship extends far beyond recreational concerns. Management of these resources needs to be approached from an ecosystem level. It requires a multidisciplinary approach, having physical, biological, and social considerations. Physical and biological considerations must address biophysical relationships. Social sciences need to address prehistoric, historical, current, and future use. An understanding of the natural and social systems that may be affected by management decisions, as well as of the associated risks to resources, is crucial in understanding the rest of the scientific data collected (Mills et al. 2001; Shaw et al. 2000).

Cave and karst stewardship must include a multidimensional perspective, considering both surface and subsurface aspects. There exist both direct and indirect associations between these two regions, as well as independent concerns. Stewardship should always be considered from a multiple-use point of view: science, education, interpretation, recreation, and resource extraction.

Cave and karst stewardship activities are being conducted on a variety of levels and offer many opportunities to develop partnerships. Relevant federal agencies include the National Park Service, National Cave and Karst Research Institute, Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, and Environmental Protection Agency. Examples of state agencies include the state of Virginia's Cave Board as well as numerous state park programs. Nongovernmental organizations include the National Speleological Society (NSS), Cave Research Foundation (CRF), Karst Waters Institute (KWI), American Cave Conservation Association (ACCA), Bat Conservation International (BCI), and The Nature Conservancy. Regional cave conservancies are on the increase.

Academic programs have presented courses, as well as supported research on cave and karst related subjects. Although the primary focus has been in the earth and life sciences, some work has been done in the social science areas, most notably anthropology (Seiser 2003). Western Kentucky University has two cave and karst programs: the Center for Cave and Karst Studies and the Hoffman Environmental Research Institute. The New Mexico Institute of Mining and Technology (New Mexico Tech) is in the process of developing a cave and karst studies program.

In addition to the research conducted by the scientific community, and work conducted by professional consultants, a significant portion of cave and karst stewardship activities is being conducted by volunteer specialists. These activities extend far beyond the recre-

ational considerations and include restoration, research, exploration and mapping, and specific cave management agreements. Efforts of these volunteer specialists exceed the combined efforts of all other special-interest groups (Werker 1999). The biannual National Cave and Karst Management Symposium is an important stewardship-based conference developed and run by volunteer caving organizations. These conferences receive sponsorship by various federal agencies, an indication of the significance of the presentations.

These professional and volunteer specialists contribute time, energy, and often their own resources to cave and karst stewardship activities for a variety of reasons. Some are interested in research, both pure and applied with the associated management implications. Some are interested from a monetary perspective, typically resource extraction (oil and gas, forestry) and patents (bioprospecting). Others contribute out of curiosity and because they care about the cave and karst environments. Understanding these motivations can lead to tapping volunteer expertise, thereby assisting in overcoming stewardship barriers created by lack of funding and/or trained personnel within an organization.

Conclusion

Cave and karst stewardship efforts will lead to enhanced scientific understanding and management of these resources, improved interpretation and education, as well as better informed land use decisions relating to surface and subsurface activities and multi-use potential.

References

- Mills, T.J., T.M. Quigley, and F.J. Everest. 2001. Science-based natural resource management decisions: What are they? *Renewable Resources Journal* 19, 10–13.
- NPS [National Park Service]. 2005. National Park Service Cave and Karst Program website, accessed April 5. On-line at <http://www2.nature.nps.gov/geology/caves/program.htm>.
- Seiser, P.E., 2003. Dark wilderness: a phenomenological exploration of the idea of cave wilderness. Ph.D. dissertation, West Virginia University, Morgantown.
- Shaw, C.G., F.H. Everest, and D.N. Swanston. 2000. Working with knowledge at the science/policy interface: a unique example from developing the Tongass land Management Plan. *Computers and Electronics in Agriculture* 27, 377–387.
- Wright, V. 2004. Barriers to science-based management: what are they and what can we do about them? (Session summary). In *Protecting Our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites*. D. Harmon, B.M. Kilgore, and G.E. Vietzke, eds. (Proceedings of the George Wright Society/National Park Service Joint Conference, April 14–18, 2003, San Diego, California.) Hancock, Mich.: The George Wright Society, 34–37.
- Werker, V. 1999. Personal communication.