

Expanding management: Prioritizing cultural and natural resources in complex sites

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Henry Chandler Cowles, plant succession, and a remnant of the Central Dunes

REVERED BY MANY AS THE “FATHER OF PLANT ECOLOGY” IN NORTH AMERICA, Henry Chandler Cowles (1869–1939) was one of the first scientists to fully explore the complex relationships among plants, soil, climate, and topography and describe in detail the patterns of plant succession. Much of his initial research exploring these themes took place in the Indiana Dunes, located on the southern shores of Lake Michigan. Cowles drew international attention to the Indiana Dunes and the study of ecology in America with his teachings, field excursions, and numerous publications (Cassidy 2007). Through his impressive and thorough works, Cowles brought notice of the work of American ecologists to scientist worldwide and garnered a place for them in the international scientific community.

Not only did Cowles strive to understand the plant ecology of the Indiana Dunes, he also worked incessantly to protect it. He was a founding member of the Prairie Club, established in 1908, which worked to gather support for the protection of the dunes from the threat of industry. In September 1916, only one month after the National Park Service (NPS) itself was established, Cowles testified in federal hearings proposing a Sand Dunes National Park. He also worked around the state of Indiana identifying other natural areas and parklands that would be of value for state purchase.

Although some of the earliest efforts to preserve the Indiana Dunes failed, they were important steps toward what later became Indiana Dunes State Park, established in 1926, and Indiana Dunes National Lakeshore (INDU), established in 1966. INDU today includes over 15,000 acres. Purchased by the federal government, INDU was part of a political compromise involving the creation of the Port of Indiana, an important industrial area in the manufacturing and transport of steel. Unfortunately, the construction of the Port of Indiana included the loss of most of the Central Dunes in which Cowles conducted his seminal studies in plant succession. The Central Dunes were part of a diverse inland marsh system that once stretched from Gary to Michigan City, Indiana. Much disrupted by industry and development, one of the last remaining remnants of the Central Dunes was aptly named Cowles Bog in his honor.

Status and management of Cowles Bog

Cowles Bog was designated a national natural landmark (NNL) in 1965 prior to its inclusion in INDU. What stands as Cowles Bog today is a 55-acre portion of the unique dune and inland marsh systems that first attracted Cowles' attention to Indiana Dunes and were the site of his important ecological discoveries. Not actually a bog, Cowles Bog can be classified as a mounded fen in which spring waters seep upward through layers of marl and peat (Douglas et al. 1986). Despite its two layers of protection, as part of INDU and as a NNL, Cowles Bog is a much different place than when Cowles first studied the intricacies of the area. Severely threatened by an invasive hybrid of non-native (*Typha angustifolia*) and native (*Typha latifolia*) species of cattail, the diverse graminoid (i.e., grass and sedge) communities that dominated the bog in Cowles' time are in decline. In the early 1900s, cattail was not a part of the bog system and diverse graminoid communities dominated. Cattail and common reed (*Phragmites australis*) communities currently form a mosaic invading what are now segmented patches of graminoids and relatively recent disturbance in the entire marsh system has altered the hydrology of the area, favoring these invaders (Wilcox et al. 1984). Current management focuses on preserving remaining graminoid communities and rare species, controlling the spread of cattail, and an intensive ecological inventory. Existing vegetation assemblages, seed bank diversity, seasonal water depths, and soil chemistry at different locations in the bog have been studied and mapped, laying the groundwork for an effective and efficient planting schema should funding become available (Mason 2008).

In need of restoration but without funds: Possible solution?

Wetland restoration requires long-term funding in order to ensure that continuing maintenance can support the large initial efforts. However, natural resource projects are generally funded on short-term cycles of 3–5 years. It is hard to justify the initial expense of removing exotic plants without securing the funds to keep them out over subsequent years. Given the history of Henry Chandler Cowles and his work in the Central Dunes, is Cowles Bog eligible for a cultural site designation? Is the ecological health of Cowles Bog critical to its potential role as a cultural or historic site? If so, would a cultural site designation increase opportunities to attain funding for vegetation restoration? Is pursuit of these funds ethical?

The purpose of this paper is to explore the challenges and duties of managing park lands containing both natural and cultural resources. Through a review of a current management concerns at Cowles Bog and case studies investigating successes in (1) cultural designation of a site previously managed for its natural resources, and (2) conflict resolution between cultural and natural resource mandates in a site possessing both, the authors hope to encourage broader thought towards the challenges of prioritizing management actions. The current management paradigm seems to rely heavily on a clear-cut dichotomy between what is natural and what is cultural. Many legislative designations and thus major funding sources are based upon a site's need for protection from threats to natural or cultural resources. This state of "competitive management" (Melnick 2000) leaves room for improvement. Our hope is that by blurring the line between natural and cultural sites, managers may move a step closer to a non-competitive management paradigm, better protecting the resource and reducing potential conflicts.

Responsibilities in management prioritization

Because Cowles Bog is a NNL within the boundaries of INDU, it is imperative that any management decisions be made within the framework of the NNL program, the NPS mission, and INDU's enabling legislation. Before we consider the pros and cons of a potential change to the management goals of Cowles Bog, we will review the larger context in which this decision must be made.

The National Park Service Mission and its changing role. An oft-quoted phrase of the 1916 Organic Act defines the purpose of NPS: to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Mention of "historic objects" sandwiched between more physical and natural characters reflects the early NPS attitude that cultural resource management was only a minor responsibility in a few of the parks (Mackintosh 1999). However, times quickly changed. A 1933 executive order transferred jurisdiction of all national monuments and sites commemorating military events to NPS. This began NPS's shift towards awareness of its responsibility to protect and identify cultural resources.

The passage of the Historic Sites Act of 1935 allowed official commemoration of sites, buildings, and objects of historical significance regardless of land ownership. Hundreds of historically and culturally significant sites were soon identified. In order to organize and prioritize the growing number of sites, the 1966 National Historic Preservation Act (NHPA) created the National Register of Historic Places to catalogue what are now the 2,500 national historic landmarks (NHLs) of national-level significance and near 80,000 other sites of local and regional significance. The NHPA also took the identification of historic sites one-step closer towards protection by (1) mandating NPS to mitigate threats to sites *potentially* eligible for listing as national historic landmarks (NHLs), and (2) requiring all management decisions that may affect an NHL to be reviewed and approved. This legislation has further obligated NPS managers to recognize and promote the wealth of cultural resources available in almost every NPS administered land.

Specific management goals and strategies at Indiana Dunes National Lakeshore. Enabling legislation, enacted at the time of park inception, defines the motivation behind creation of a park and mandates the future direction of park management. Changes to it can occur only by an act of Congress. Enabling legislation can vary significantly between parks based on regional land use history, cultural history, species of concern, and perceived threats to the park, among other factors. INDU has developed four purpose statements based on their enabling legislation. The general management plan for the park requires that all stated actions will follow in accordance with these purposes (NPS 1997).

1. Preserve, maintain, and restore the integrity and character of the natural resources and processes and protect cultural resource values at the lakeshore.
2. Provide educational, inspirational, and recreational opportunities compatible with preserving natural and cultural resource values.
3. Inspire in the public an appreciation of and sense of personal stewardship for lakeshore resources.
4. Interpret, encourage, and conduct scientific research in the tradition of pioneer investigators.

Designation defined: The National Natural Landmark Program. The National Natural Landmark Program, administered by the NPS under the Historic Sites Act of 1935, was created to designate NNLs of “exceptional natural value to the nation as a whole ... that best illustrate the biological and geological character of the United States” (NPS 1999). Proposed NNLs must meet a primary criterion of being an important example of a unique natural feature that is less disturbed than other examples of that same feature. NNLs may also be selected using secondary criteria of diversity, rarity, and values for science and education (NPS 1999). Designated regardless of ownership, NNLs do not have to be open to the public. Benefits of designation include the “positive recognition and appreciation of nationally significant resources and the ability of public agencies and private individuals and organizations to make more informed development and planning decisions” (NPS 1999). Monitoring of NNLs is required but subject to approval. Removable upon deterioration of the resource, NNL designation is not permanent.

Cowles Bog was designated an NNL in 1965, one year before the establishment of INDU. Although its status as an NNL in 1965 may have held distinction and hope for its protection, as it became part of INDU, all meaning of the NNL designation essentially faded.

Expanding management: Should Cowles Bog acquire a higher designation?

For the purposes of this paper, the authors propose that management of Cowles Bog be shifted away from its predominately natural resource focus toward one more comprehensive and inclusive of the cultural themes implied by Cowles himself. We feel that Cowles Bog provides an excellent opportunity to highlight Cowles’ scientific, educational, and conservation-minded achievements with hopes that it may inspire similar spirit to visitors of the area. We feel this management shift is in harmony with the NPS mission, the enabling legislation of INDU, and the goals of the NNL Program. Before moving further, we will examine the potential costs and benefits of making this shift regarding such an important site to the history of America and the scientific field of ecology.

Pros. There would be many benefits to expanding the management focus of Cowles Bog, the largest being the potential for its restoration. Removal of non-native species and rehabilitation of plant diversity to the level that inspired Cowles and his students is critical to the character of the area. Its status as merely a remnant of the Central Dunes that existed here prior to construction of the Port of Indiana only increases its importance. Committing to preserve and interpret the

cultural and historical aspects of Cowles Bog by pursuing a higher cultural designation, such as status as a National Historic Landmark, may allow access to a wider variety of funding sources. Increased funding would not only increase the success of a restoration project but also provide opportunities for expanded environmental education. Site improvements, such as more trails or boardwalks and interpretive signs, would provide a chance to tell the history of this important site and foster a greater connection to Cowles' contributions and legacy.

INDU's general management plan commits to reaching stated visitor experience goals and interpreting park resources along selected primary themes. One visitor experience goal is to "know about, appreciate, and support resource preservation, management, and restoration programs and goals." Cowles' link to the Prairie Club, the establishment of the park, and conservation across the state of Indiana is an excellent showcase for reaching this goal. Primary interpretive themes stated include the history of citizen commitment to conservation of the area, recognition of a century of important study of the natural and cultural resources, ecological succession and its study, and an exhibition of the area's rich plant and animal diversity. Cowles himself was influential in all of these themes. Increasing commemoration and interpretation of Cowles using Cowles Bog as a showcase will benefit and better protect the natural and cultural resources in direct line with INDU's enabling legislation.

Cons. There are also potential costs and limitations associated with converting this site to a combined cultural-natural resource management schema. There is a delicate balance when managing an area for both natural and cultural resources simultaneously. As mentioned before, additional funding would most likely lead to site improvements such as more trails, boardwalks, and interpretive signs. This leads to the potential of vegetation trampling and erosion caused by trail use. There is also the possibility that increased trail use in the area could lead to increased non-native vegetation invasion as trail users spread seeds around the restoration site, potentially disastrous for the restoration effort.

An additional concern is the possibility that increased focus on Cowles Bog may divert funds from other projects within INDU or nationwide. Operating in cooperation with multiple county and town governments, INDU is a unique park in that it is amazingly diverse for its small size and segmentation. Many federal and state listed species require habitats found only in the park. Fascinating ancient, pre-1900, and recent cultural sites scatter the park, also requiring protection. Although we argue for the importance of Cowles Bog, we do not argue against the importance of other clearly valuable natural and cultural resources.

Case studies: Encouraging successes

To fully grasp the potential consequences of a management shift such as this, we looked to a few real-world examples to help us in considering each of the potential pros and cons mentioned.

Case Study 1: Judd Gardens—Cultural designation of a site previously managed for natural resources. Shenandoah National Park (SHEN), although traditionally considered a park that focused on its natural resources (Krumenaker 1998), has more recently embraced its cultural legacy. One example is the restoration of Judd Gardens, a cultural landscape that pre-dated the park (described by Eyring 1998).

Once a part of an early 20th-century mountain resort named Skyland, the George H. Judd family constructed the Judd Gardens over many years. The gardens incorporated native and ornamental plants, rock and wood work, as well as controlled vistas of mountain peaks. Although SHEN was established in 1936, the Judds were allowed to stay on the property and maintained the gardens until 1958. After 1958, natural vegetation succession began to take over, leaving the gardens in disarray.

As mentioned before, the National Historic Preservation Act of 1966 mandates the NPS to mitigate for threats to cultural sites that are eligible for listing as national historic landmarks. By the 1980s, Judd Gardens, albeit overgrown, represented a potentially eligible NHL due to the integral part it played in the broader cultural landscape of the Skyland Mountain Resort. Therefore, SHEN and the NPS Mid-Atlantic Regional Office teamed up to evaluate the eligibility of Judd Gardens for nomination as a NHL (process outlined in Eyring 1998, NHL eligibility described in Mackintosh 1985).

After intensive natural and cultural resource inventory of the site, Judd Gardens was determined to be an integral part of the NHL-eligible Skyland Historic District. The potential Skyland Historic District was determined to be an important piece of a national trend towards outdoor recreation and mountain resorts that occurred in the late 18th and early 19th century (Eyring 1998). Now dealing with a NHL-eligible site, the management team then investigated ways to best integrate strategies accounting equally for natural resource, cultural resource, and maintenance concerns (Eyring 1998).

Case Study 2: Oliver Salt Works—Conflict resolution between cultural and natural resource mandates in a site possessing both. In some instances, the needs of cultural resource interpretation are in direct conflict with the needs of the biological resources of a protected area. In these cases, it is up to land managers and scientists to determine the needs of park users and biotic resources, examine a host of planning alternatives to determine which park resource is the priority, and develop a reasonable compromise.

Such is the case with some lands in the South Bay Salt Pond Restoration Project (SBSPRP), a large-scale wetland restoration taking place in South San Francisco Bay, California. At over 15,000 acres, the SBSPRP is the largest tidal wetland restoration project on the West Coast of the United States. The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) manage the lands of the SBSPRP. The project has the concurrent goals of protecting wildlife and providing public access and recreation opportunities, objectives that can require complex management decisions. One specific location within the project area supports nesting western snowy plovers (*Charadrius alexandrinus nivosus*), federally listed as a threatened bird species, as well as the Oliver Salt Works, a significant cultural and historical site.

The Eden Landing complex of ponds and wetlands within the SBSPRP supports the largest portion of breeding plovers in the South San Francisco Bay (Robinson et al. 2007). The snowy plover is a federally listed threatened species, protected by USFWS under the Endangered Species Act. Nesting western snowy plovers can be very sensitive to nearby trail use. Robinson (unpub. data) found nesting plovers flushed from their nests at an average distance of 175m (SE=45, N=24) as researchers approached. Birds flushing from their nests leave eggs and young chicks vulnerable to predation.

The Eden Landing site also contains the vast majority of cultural and historical sites within the Project area (South Bay 2007). The Oliver Salt Works, for instance, is a cultural site reflecting the extensive history of salt production in the South Bay and today contains such items as submerged salt vats, historic levees, pylons, machinery, and machine mounts (South Bay 2007). For many outdoor recreationists, visiting historical and cultural sites ranks high on the list of preferred activity types. In fact, 86.7% of outdoor recreationists surveyed in California indicated that when engaging in outdoor recreation, they visit historical and cultural buildings, sites, or areas (California State Parks 2003).

Plovers nest in the pond where the Oliver Salt Works is found and the existence of these two resources in the same location presents a management dilemma and requires complex decision-making. From a strict biological resource protection point of view, managers could opt to remove the historic salt works debris to expand

available nesting habitat for snowy plovers, or at least close the site to public access. From a strict cultural resource protection and interpretation point of view, managers could opt to install interpretive trails to all cultural sites within Eden Landing, regardless of the existence of breeding birds, if permitted by federal law, which requires protection of the species. However, a responsible land manager would see that it is impossible to ignore the needs of either the public or the plovers at the expense of the other.

To address this management challenge, SBSPRP land managers in concert with the project's science team and consultant team underwent a multi-year planning process in which they held public workshops with stakeholders as well as meetings with regulators to weigh their options on this and many other issues. This work revealed that, from a scientific standpoint, there is uncertainty as to how plovers in Eden Landing would respond to trail use, with the possibility that they might become habituated to human presence. The planning process also showed that, from a public standpoint, it is clear that the Oliver Salt Works is a very valuable and unique historic resource.

The managers decided to concentrate public access in the Oliver Salt Works area and open an interpretive trail to the site and provide an overlook; this site was singled out as the largest and most visible of the cultural and historic sites in Eden Landing. This trail and overlook are likely to reduce or eliminate some nesting habitat for the plover adjacent to these features. Thus, project managers are also enhancing snowy plover habitat in other parts of the complex to compensate for this impact. In addition, most other areas within Eden Landing will be closed to the public to protect snowy plover nesting habitat regardless of the existence of historical or cultural sites (South Bay 2007).

Moving forward, SBSPRP managers will be using an adaptive management approach to evaluate the effect of public access on sensitive species and, using that information, will make changes as required. Within that context, plover breeding populations will continue to be monitored and any trail use-related disturbance addressed.

In this instance, when faced with a difficult resource conflict, land managers were able to weigh all options and come up with a workable solution, including long-term goals and a method for continued monitoring of progress. It is important to note that the case of the SBSPRP is unique in that it is a very large project area. Eden Landing alone is 2,225 hectares; therefore, the sacrifice of a portion of plover nesting habitat presumably still leaves a large percentage of land available for nesting. A smaller protected area might not have this luxury.

Back to the bog: Lessons learned from case studies

Both of these case studies illustrate successes in prioritization of management in sites rich in both cultural and natural resources. At Judd Gardens in SHEN, recognition and restoration of a valuable piece of an untold cultural story led to better management of natural and cultural resources. Invasive garden plants that had persisted in the system were removed and relic stonework and furniture in the garden were repaired. The result was a richer visitor experience. At Eden Landing in the SBSPRP, a conflict between a sensitive biotic resource and a valuable cultural resource was resolved through an organized planning process, review, and monitoring. Cultural and natural resources were prioritized together as mutually important and what appears to have been the best possible compromise was reached.

Both case studies also highlight the importance of inventory to all management decisions, whether they involve natural and/or cultural resources. Knowing the resource in question, both qualitatively and quantitatively, is essential to decision-making. Both case studies also draw attention to scale. It was not Judd Gardens itself that garnered NHL standing but rather its place in the context of the potential Skyland Historic District. Similarly, if not for the size of the SBSPRP, a different

compromise would have been made to best protect both the cultural and biotic resources at stake.

These are just two of many possible case studies involving sites rich in both cultural and natural resources. Thus far, we have attempted to establish that Cowles Bog is one such site even though there are no historic structures there and historically it has been managed only for natural resources. We have proposed an expansion of management to focus on the potential of cultural interpretation at the site, and we have stated pros and cons of such expansion.

We have proposed the idea of pursuing a higher cultural designation for better management of the resources at Cowles Bog, but based on our research and consideration of case studies, we feel that this would be inappropriate. Although Cowles Bog unquestionably possesses historical and cultural values important to the broad national themes of conservation and ecologic understanding, it is unlikely that it is eligible for listing as a NHL. There are few NHL criteria with which it may comply, namely that it is “associated with events that have made a significant contribution to, and are identified with, or that outstandingly represent, the broad national patterns of United States history and from which an understanding and appreciation of those patterns may be gained.” However, the relationship between Cowles Bog and Cowles himself is not necessarily that steadfast and arguments can be made Cowles’ work was not significant on a national scale.

Furthermore, most existing NHLs involve some aspect of the built environment. Those that are situated within predominately natural landscapes, such as in Mount Rainier National Park, revolve around historic buildings. For example, Aldo Leopold’s Sand County shack and farm is designated an NHL partly because of his pioneering work in the field of ecology, but again, the designation revolves around the buildings in which he worked and lived. There are no structures at Cowles Bog, and in fact, most of the Central Dunes in which Cowles did his seminal work was destroyed in exchange for the rest of INDU’s land.

However, following the Judd Gardens example, there is potential for Cowles Bog to fit into a potential NHL historic district yet to be established, one that tells a broader story than what Cowles Bog and Cowles can offer. For example, the Glacier National Park Tourist Trails Historic District, listed as an NHL in 1996, comprises 163 miles of trail and is considered illustrative of the Glacier Park Hotel Company’s mission to bring in visitors by attracting them with a European-style vacation experience (NPS 2008). Perhaps Cowles Bog could be considered illustrative of the conservation of INDU and other wildland-urban interface parks nationwide.

Conclusion: Prescription for the management of Cowles Bog

Cowles Bog stands as a remnant piece of ecological and conservation history. Although most of the Central Dunes are gone, Cowles Bog can still be used to celebrate the sites where major advances in plant ecology were made, where Cowles brought class after class of students and professors from around the world to share in his study and examination of unique habitats, and where he became involved and inspired enough to push for the establishment of INDU and the permanent protection of the Indiana Dunes.

Individual people often teach us the meaning of place and thus establish cultural values (Melnick 2000). Cowles Bog stands to commemorate not only the history of Cowles and his achievements, but also the changes his achievements inspired in the people all around him. The authors propose Cowles Bog be considered a “cultural landscape.” There are no historic structures to denote Cowles’ presence and conquering of the landscape. The landscape, once pristine, has been altered and segmented by nearby human activities. Yet Cowles Bog and Cowles himself retain significant potential as a cultural landscape in flux with important lessons waiting to be exposed.

A cultural landscape allows for an understanding of place that does not require pitting nature and culture as adversaries (Melnick 2000). As opposed to a historic structure that requires maintenance, or a pristine wilderness that cannot be spoiled, a cultural landscape view allows for a continuum of both nature and culture coexisting.

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