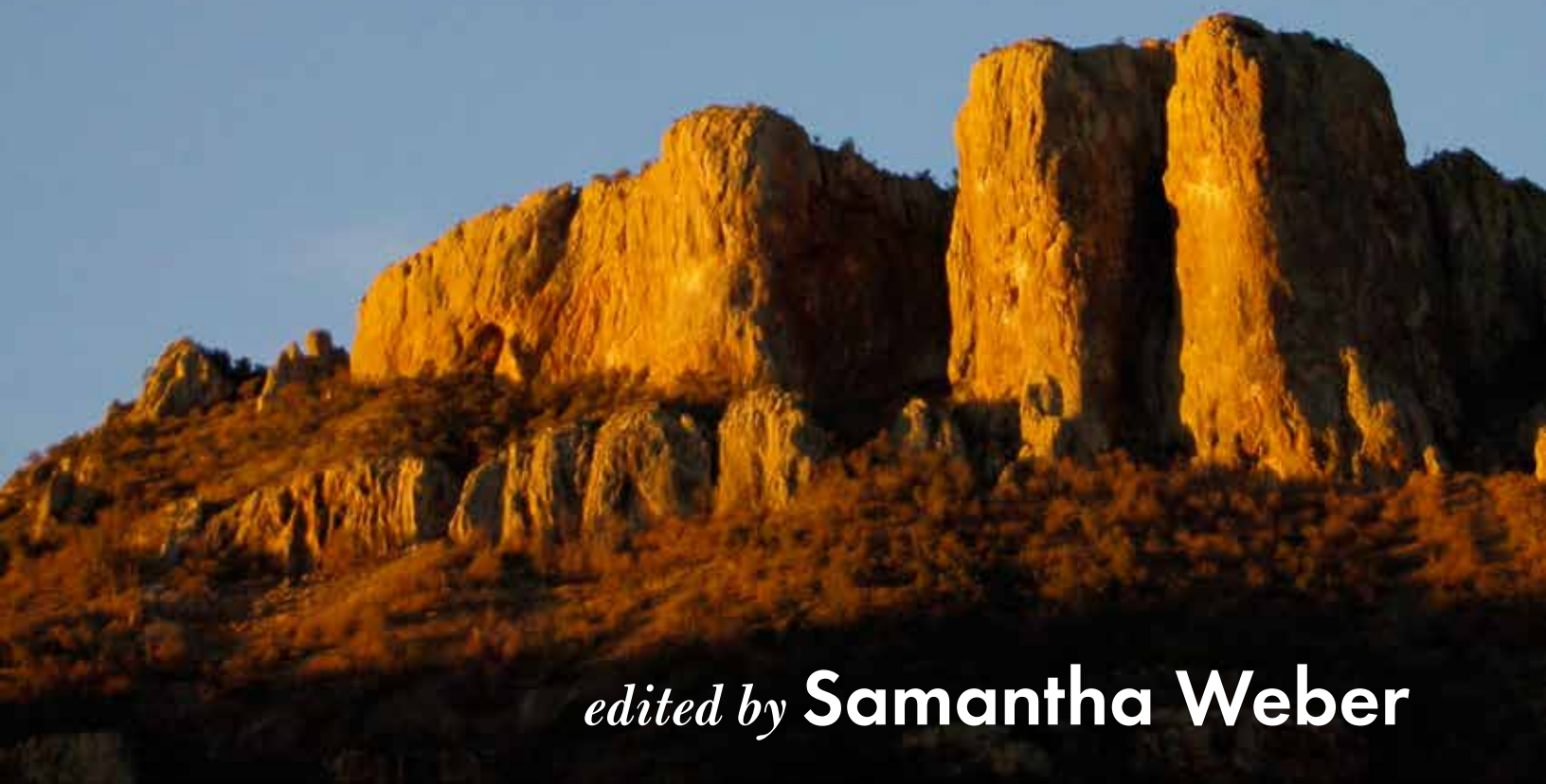
GWS2013

Protected areas in a changing world
Denver, Colorado • March 11–15, 2013

Protected Areas in a Changing World

Proceedings of the 2013 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites



edited by Samantha Weber

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On the cover
Early morning in Big Bend National Park. Photo by Samantha Weber.

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Introduction and Acknowledgments

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Denver, Colorado, was the site of the 2013 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites. The event, which took place March 11–15, was the seventeenth in a series of conferences whose origins date back to 1976. That year marked the first US National Park Service science conference, and another followed in 1979. Beginning in 1982, the GWS became the organizer and primary sponsor of the conferences, expanding them to include all fields in natural and cultural resources—not just science—and all kinds of parks, protected areas, and cultural sites—not just US national parks. The GWS biennial has become the USA's largest interdisciplinary conference in the field. It is the only such conference to actively seek participation from across the entire spectrum of disciplines and activities that are necessary for successful protected area management.

GWS2013 was significantly affected by mandatory cuts to the US federal government budget that went into place just 10 days before the start of the conference. The uncertainty surrounding these cuts presented the biggest planning, logistical, and financial challenges the GWS has ever faced in organizing these conferences. There were many repercussions, but one is particularly germane to these proceedings: virtually no US federal employees were allowed to attend. This explains the absence of agency representatives among the authors of the papers presented here, as well as the brevity of this volume in comparison with previous ones.

Despite all this, the overwhelming judgment of those who did attend was that the event was a success. Some new faces were able to step into the limelight, and the week was full of new ideas and dynamic interactions. We are indebted to many people for making this possible. Once more, Samantha Weber has applied her exacting and discerning editorial skills to this proceedings volume, and we thank her for all her good work. As always, the Conference Committee labored over many months to shape a large, interdisciplinary program. It was chaired by David Parsons, and the other members were Brad Barr, Andy Ferrell, Nathalie Gagnon, Barrett Kennedy, Melia Lane-Kamahele, Brent Mitchell, Jerry Mitchell, Carena van Riper, Jan van Wagtendonk, and Mike Wong. Our principal organizational sponsor was once again the US National Park Service, and we were pleased to have Vanasse Hangen Brustlin, Inc., and Hitachi Consulting as conference supporters.

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We also thank the members of our Native Involvement Working Group for their many hours of discussion and planning of activities to engage Indigenous people at GWS2013: Nathalie Gagnon and Melia Lane-Kamahele (co-chairs), Deanna Beacham, Monique Fordham, Angeles Mondoza Sammet, Angela Mooney D'Arcy, and Fawn YoungBear-Tibbetts. Beyond that, the GWS thanks all the people who organized the slate of field trips, the institutions and individuals who helped sponsor the George Melendez Wright Student Travel Scholarships and the Native Participant Travel Grants, and the many others provided assistance on various aspects of the conference—we extend our sincere appreciation to all of them.

The next conference will be held March 29–April 2, 2015, in Oakland, California.

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Tort Liability in National Parks and How NPS Tracks, Manages, and Responds to Tortious Incidents

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Since the Organic Act mandates that the National Park Service (NPS) mission is to conserve the natural and cultural resources within its units, NPS cannot eliminate all dangers to visitors. As the 2006 NPS management policies state: "Park visitors must assume a substantial degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments" (NPS 2006, 105). The risk is serious, as over 5,000 serious injuries occur among park visitors each year, with 98 percent of them occurring in 110 parks (NPS 2013). Due to Government Performance and Results Act requirements, NPS must report fatalities and serious injuries in the parks, but there is scant reporting of less serious claims. In terms of actual litigation, not all who are harmed file claims, and not all claims filed have merit; the latter is mainly due to governmental immunity from many types of tortious incidents.

This paper first explores the extent of liability the government faces for tortious incidents that take place in national parks. Then the cost of legal actions stemming from tortious incidents, and government efforts to track such incidents, will be detailed. Last, public risk management efforts to reduce tortious incidents in national parks, and a case study showing how proper tracking of tort claims can lead to more effective public risk management strategies, will be presented.

A "tortious incident" is any civil wrong that occurs when one person's action or inaction causes injury to another and from which a remedy may be obtained. Attorneys in the Department of the Interior's Office of the Solicitor (DOI-OS) make the ultimate decision on whether to settle or litigate a claim made against NPS. While there is no database that keeps track of all tort claims against NPS, as will be detailed later, there is no doubt that in most claims, NPS is not liable for the incident.

NPS is often not liable due to exceptions in the Federal Tort Claims Act (FTCA). The FTCA, passed in 1946, waived the government's general immunity and declared that tort actions against the US were authorized under circumstances "where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred" (28 USC Ch 171 section 2672). The FTCA has a discretionary function exception that is

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a major restriction on claims allowed under the law, as it shields the NPS in many cases. The 1991 Supreme Court case *United States v. Gaubert* affirmed the two elements that must be met for the discretionary function to apply: the act giving rise to the alleged injury involves an "element of judgment or choice," and the judgment must involve social, economic, or political policy of the kind that the discretionary function exception was designed to shield (*U.S. v. Gaubert*, 322–323).

Several NPS officials were interviewed for this paper. One attorney at a DOI regional solicitor's office remarked, "In 22 years at the regional solicitor's office, I've only seen us lose once on the discretionary function exception" (DOI regional solicitor interview). This makes sense, considering the first prong is often satisfied since Congress rarely specifies to NPS that amenities like lights and handrails need to be put in specific places. NPS Director's Order 50C (NPS 2010) regarding the Public Risk Management Program bluntly states, "The means by which public safety concerns are to be addressed in each park falls under the discretion of the park's superintendent" (NPS 2010, 2). The second prong is also often satisfied since the *Gaubert* court said that when a regulation allows for employee discretion, this creates a "strong presumption" that the discretion authorized by the regulation involves the same policies underlying the regulation's promulgation (*U.S. v. Gaubert*, 324). In other words, if the regulation creates the opportunity for discretion, then the policy considerations required to satisfy the second prong exist (Hyer 2007, 1106).

Two cases from the U.S. Court of Appeals for the Third Circuit help illustrate what kinds of incidents are covered under the discretionary function exception. Note that while it seems to be a bright line test, at times the court may reason around the "strong presumption" to get the outcome it feels is best.

Merando v. U.S. is an instance where the discretionary function exception immunized the U.S. from suit. A family was driving in Delaware Water Gap National Recreation Area (DWG) when a 27-foot red oak fell on their car and killed the mother and a daughter. The court noted that there were no state regulations or agency guidelines specifically providing that if a tree inspection plan was developed, it would need to include particular inspection procedures (*Merando v. U.S.* 2008, 166). Thus, NPS was free to balance safety objectives with practical considerations such as staffing and funding in deciding that low-traffic areas like where this accident occurred would only get windshield inspections. This is exactly the type of policy decision the court wants to avoid second-guessing.

Cestonaro v. U.S. is an instance where the discretionary function exception was deemed not to apply. While vacationing with his family, Daniele Cestonaro was shot and killed in the parking lot of Christiansted National Historic Site. The court reasoned that NPS failed to show how providing some parking lot lighting, but not more, was grounded in its management policy objectives, specifically to maintain the area's historic appearance. There was no "rational nexus" between the lighting decisions of NPS and social, economic, and political concerns (*Cestonaro v. U.S.* 2000, 759). The court declared that NPS cannot make decisions unrelated to policy and then seek shelter under the discretionary function exception. One could make a strong argument, though, that this case is similar to *Merando* in that there were no guidelines stating how much light needed to be provided in parking lots, and NPS officials made a policy decision regarding how much to provide.

Not withstanding *Cestonaro*, the court often does not scrutinize the policy decision for such a "rational nexus" but rather makes the presumption, detailed in *Gaubert*, that if discretion is given, it involves the policy considerations underlying the governing regulation. Still, even with immunization from most tort claims, millions of dollars are spent each year in settling and litigating such claims stemming from incidents in the national parks. NPS does not know how much in total is paid to deal with tort claims in any given year. For any case that costs more than $2,500, the money comes from the Judgment Fund, a permanent, infinite fund that Congress created to pay

compromise settlements and judgments against the United States. For such cases, the cost does not come out of any park unit's budget. This may actually lead to less of an incentive for parks to take steps to prevent tortious incidents as the parks often do not directly pay for the damages. In the last ten years, $39,232,921.71 was spent for NPS administrative payments (settled by agencies without Department of Justice assistance) and NPS litigative payments (payments for claims where Department of Justice was the defendant agency) (Department of the Treasury 2013). This figure does not include payments made by individual parks or NPS staff time to help handle cases.

There may not be much of a financial incentive, but Director's Order 50C does say, "The NPS must strive to prevent visitor injuries and fatalities within the limits of available resources" (NPS 2010, 2). This directive is much harder to comply with considering NPS officials have had no way to track tort claims. While NPS has had an electronic database for tortious incidents involving workers called the Safety Management Information System for more than a decade, it was not until January 2013 that the Department of the Interior as a whole adopted a system to electronically track visitor incidents: the Incident Management Analysis and Reporting System (IMARS). IMARS has been over budget and behind schedule as DOI's FY2008 budget justification actually called for IMARS to be implemented department-wide in 2008 (NPS 2008). One NPS safety officer remarked, "IMARS became a running joke: IMARS is coming, IMARS is coming, the sky is falling" (pers. comm., 31 January 2013).

Jokes aside, IMARS holds a lot of promise. It will allow NPS staff at all park units across the country to query the system for a variety of factors that are documented by each incident report. For example, one could look at how many 20- to 30-year-old, black-haired, white males had a certain type of injury or illness. Further, now park staff at Shenandoah National Park can see if some type of incident is also occurring in parks out west. As one NPS park ranger said, "The main power of IMARS is sharing amongst all these disparate park units."

While several previous vendors failed to deliver, the operating system used for IMARS has a track record of success; it has now been used worldwide for the past 15 years, including in Canada, the United Kingdom, Alaska, and Missouri. Still, the system is only as powerful as the information put into it. There may be some push-back from park rangers regarding learning a new system. Also, the current requirement is all "significant injuries" must be documented, but there is no clear definition of a significant injury (pers. comm., NPS regional safety manager, 6 February 2013). Further, the system will not pick up near-misses, those incidents that almost result in a serious injury.

If IMARS is utilized to its full potential, it will be a rich source of data that NPS public risk managers can then utilize to adequately respond to the new servicewide emphasis established in Director's Order 50C in 2010 on prevention of visitor incidents, rather than just responding to them (NPS 2010). The Director's Order 50C does include some specific guidelines and recommendations, such as calling for tort claims officers and safety officers at the park level (NPS 2010). Unfortunately, due to funding restrictions, only the major parks have such employees. Much more common is that a park ranger has safety or tort claims officer as a collateral duty, which means it is officially only supposed to take 20 percent of their time. The NPS Office of Risk Management does not know how many parks have some sort of safety officer, since roles and jobs change so rapidly. As one Office of Risk Management employee put it: "I learn of a new point of contact almost every day."

Aside from staffing issues, even if there were an employee who wanted to try to implement a program to reduce risk to the public, there is a lack of funds to accomplish such programs. Aside from the small amount in park budgets for risk management programs, NPS employees may be able to get money from the NPS Project Management Information System, but these grants are given out once every two years, and must be applied for well in advance. For some time prior

to 2013, there was money made available for a summer internship program, jointly run by the NPS Public Risk Management Program and the Student Conservation Association, that provided opportunities for students to support park injury-prevention efforts, and provide parks with a cost-effective way to enhance visitor and employee safety. The program did not run in 2013 since no funding was made available.

The internship program was a critical component of a public risk management program at DWG. In 2011, there were eight drownings in the park, and the years preceding were not much better. NPS wanted a program to curb this high number of drownings. Luckily, in 2008, a ranger had been directed to review all drowning incidents since 1961, resulting in a rich dataset that DWG used to determine who was mostly likely to drown, where and when. The data revealed that Saturdays and Sundays between 12 p.m. and 6 p.m. were the most common times for drownings, and that victims were most commonly males between 18 and 33 years old, and the proportion of victims that were Hispanic was increasing. Incidents were also charted by location, revealing that the canoe access area by the Kittatinny Point Visitor Center was a frequent site of drownings.

Over the course of three years and several funding sources, DWG was able to implement a targeted program to address the risk of drowning. In 2009, the park applied for and received a public risk management intern. This intern conducted some observational studies to see how people reacted to various warning signs. For instance, the intern noted what percentage of visitors would stop and read the different types of signs. The following year, DWG applied for and got $30,000 from the NPS Youth Internship Program. This funded another public risk management intern and a full-time GS-5 park interpreter to work together to launch a volunteer corps to talk to visitors, and to have more eyes on the busy areas that the data indicated most drownings occurred. The money was also used to purchase ten new signs, as the old signs were only in English, and were a paragraph long (Figures 1 and 2). In 2011, the volunteer water safety ambassador corps was launched. Ultimately, 18 dedicated volunteers were trained to go out on kayaks with staff every Saturday and Sunday, targeting the busiest areas. The volunteers would model safe behavior, talk with visitors about water safety, and for positive reinforcement, give visitors safety equipment, such as whistles and water bottles. The result of all these efforts: no drownings in 2012.

Declaring the public risk management program at DWG a success must be done cautiously. While there were no drownings in 2012, it is not possible to know how many drownings would have occurred in 2012 without the program. Further, in 2013 there were five drownings, including a nine year old boy. The volunteer water safety ambassadors were not out in 2013, but the revamped signs were in place and a number of river safety advisories were issued through traditional and social media. There is uncertainty if the drop in drownings in 2012 was due to the multi-faced risk management program or other factors such as that year there being a lot of rain on weekends

Figure 1. An old sign warning visitors of the dangers of swimming in the Delaware River. Note how it is all in English and is one long paragraph. Photo credit: Kathleen Sandt, Park Ranger and Outreach and Education Coordinator, Delaware Water Gap National Recreation Area (DWGNRA).

Figure 2. A new sign installed in areas where park officials knew drownings frequently occurred since they had analyzed data going back more than 40 years. The signs were developed knowing what type of visitor was most at risk, and after studying what type of signs visitors respond to the most. Note that the sign is bilingual and to the point. Photo credit: Kathleen Sandt, DWGNRA.

during peak drowning times, which means fewer people swimming.

Regardless of cause and effect issues, this case study from DWG exemplifies the utility of data and the need to make funding available for public risk management programs aside from and including those addressing fatalities. Without the data, those leading the risk management program would not have known whom to direct the safety message toward, or where to the message would reach those most at risk. Further, without the internship program and grants, DWG would not have had the money or the resources to address the drowning issue, and launch the volunteer water safety ambassador program.

NPS may be on the cusp of major strides in public risk management. It is possible that IMARS may empower other park units to take similar proactive, data-driven action like DWG did, but it is imperative that park employees on the ground actually enter the information into the system. Such action could lead to fewer injuries in our parks, thereby reducing the number of tort claims filed against NPS. While NPS often avoids liability with the FTCA's discretionary function exception, and much of the money paid litigating or settling claims does not come out of NPS's budget, it is still a major goal of the agency to provide safe experiences for visitors, and it is still important for the government in general to cut costs where it can. The national parks are quite possibly "America's best idea," and the best way to reduce tortious incidents in our parks is with data-driven approaches that can be implemented with adequate funding and staffing.

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Proposing New Barrens National Natural Landmarks

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The National Natural Landmarks (NNL) Program, administered and maintained through the National Park Service (NPS), was established in 1962 with the goal of highlighting sites that best demonstrate the outstanding geologic and biologic features of the United States. In a unique partnership between public and private landowners, the NPS accepts sites into the program that best illustrate the diversity of our country's natural heritage, regardless of ownership. The NNL Program seeks solely to recognize these sites for their geologic and biologic significance, and to strengthen the public's appreciation for and conservation of America's natural heritage. Potential NNLs are evaluated based on the following criteria: outstanding condition, illustrative value, rarity, diversity, and value to science and education. Sites are designated by the secretary of the interior and, as of today, 586 landmarks have received the NNL designation.

We conducted an analysis of the existing NNL portfolio of sites within three physiographic regions of the Northeast: Piedmont, Valley and Ridge, and Appalachian Plateau (Figure 1). The goal of the assessment was to identify under-represented biologic and geologic themes, and to recommend potential new sites within the region whose character provides excellent illustrations of those theme gaps. To identify specific sites for recommendation to the program, we examined studies of hundreds of sites previously considered for nomination as potential NNLs in the relevant physiographic provinces. Two sites came to the forefront in this review: Albany Pine Bush Preserve, and Nottingham Serpentine Barrens. Both are representative of a new barrens theme which is missing from the current list of landmarks. These biologically diverse ecosystems combine outstanding examples of important geologic themes (e.g., eolian landforms; works of glaciers) and ecological processes (e.g., fire). They also provide good habitat for rare species in relatively urban settings that havegood potential for public education. The gap analysis demon-

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Figure 1. Map of three physiographic provinces assessed and two barrens study sites.

strates how the NNL program provides a highly structured but flexible system for the continued expansion of this catalogue of the country's diverse natural landscape.

Albany Pine Bush

Albany Pine Bush Preserve supports significant examples of periglacial sand dunes and pitch pine–scrub oak barrens. The preserve is located between the cities of Albany and Schenectady, in the Capital District of upstate New York (Figure 1). The preserve is owned by multiple private and public organizations, and is managed by the Albany Pine Bush Preserve Commission. The site is one of only two pine barrens that support a dynamic sand dune landscape in the Appala-

chian Plateau region, and one of two sand dune ecosystems within the Appalachian Valley and Ridge region. This extraordinary ecosystem gives rise to a variety of habitats. The sandy, well-drained soils are home to 45 of the 538 (by March, 2013) wildlife species of greatest conservation need (SGCN) found in New York State (see www.dec.ny.gov/docs/wildlife_pdf/appendixd1.pdf), including one state and federally endangered species, the Karner blue butterfly (*Lycaeides melissa samuelis*).

Primary geological features. Periglacial sand dunes are fossil landscape features that are common throughout colder climates of the world. These types of inland sand dunes are the result of wind action reworking sediments from glacial lakes or outwash dating back to prior periods of glaciation. The sand dunes at Albany Pine Bush are indicators of past aridity associated with the cold, dry, and windy climates encountered during the Late Pleistocene. Following the retreat of the Laurentide ice sheet, and subsequent evaporation of the resulting glacial lake, thick sediment deposits were exposed to continual wind erosion. This led to the formation of scree and finer sand particles which were shaped into dunes and depressions.

The preserve is a bit unusual in that it contains representative examples of both parabolic and longitudinal dunes (Figure 2). Prevailing northwesterly winds shaped most of the sand dunes, forming primarily parabolic dunes that ranged from 100 to 2,000 feet in length. Typically oriented with their longest axis running from northwest to southeast, the crescent shape of these dunes suggests they were colonized early by vegetation, which helped stabilize the dune surface and prevent significant reworking (Barnes 2003). Eolian processes also contributed to the formation of short, broad, ridge-shaped longitudinal dunes, usually between 30 to 60 feet high, and typically several hundred feet long (Bradley, Younge, and Kozlowski 2010). Today, the dunes are characterized by a transitioning topograph,y from flat to gently rolling surfaces, with both sand swells and low domes being dotted with pitch pine (*Pinus rigida*) and carpeted with diverse understory plant species. Swamps, wetlands, and shallow ponds have filled in holes that were long ago eroded into the sandy soil (Bried and Edinger 2009). In colder months, the low-lying depressions between the dunes can act as "frost pockets." As the cooler air settles into these areas, plant growth is delayed, relative to higher elevation areas. Frost pockets result in less dense patches of scrub oak (*Quercus ilicifolia*) in these areas, and they instead become dominated by prairie grasses and sedges.

Primary biological features. The dynamic mosaic landscape of the Albany Pine Bush gives rise to a globally rare assemblage of plants and animals. Owing to nutrient-limiting sandy soils and the heterogeneous topography of the dunes, sand dune ecosystems support a diverse biota

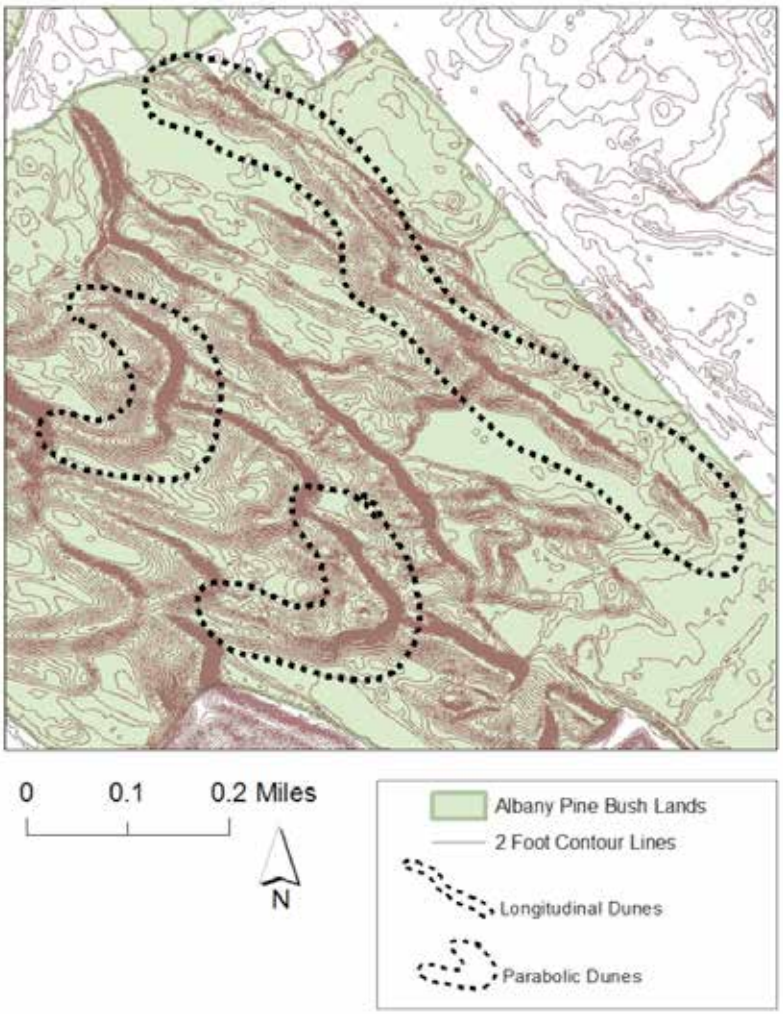

Figure 2. Examples of both longitudinal and parabolic dunes found in the Albany Pine Bush Preserve.

dominated by pine barrens in higher-lying drier habitats and wetlands in low-lying wet areas at the base of the dunes. The Albany Pine Bush provides one of the best and largest examples of an inland pine barrens ecosystem in the world, and covered approximately 40 square miles before European colonization (USFWS 1997; Barnes 2003). Pitch pine–scrub oak communities dominate the Albany Pine Bush landscape, making up 42 percent of the mapped communities in the preserve. Fire disturbance within a pine barrens ecosystem serves to rejuvenate the natural community, drive out exotic plant species, and increase the food and habitat supply for native insects and other animals (e.g., Beachy and Robinson 2008). Fire is important to maintaining the unique ecological qualities of the community (Milne 1985). Good natural conditions for wildfires have existed within the Albany Pine Bush Preserve for thousands of years, especially during the frequent periods of high winds, because the sandy, nutrient-poor soil tends to be droughty, and a fuel supply of plant litter accumulates rapidly due to retarded microbial decomposition (Barnes 2003). The dry, acidic soils of the Pine Bush do not promote the decomposition of litter, and the lack of earthworms or other organisms in the dry upper layers of the sandy soil mean that organic matter decomposed by fungi is not incorporated back into the soil.

The Albany Pine Bush is nationally recognized for its extensive populations of rare butterflies and moths, and management plans have focused on the protection of these rare insects (APBPC 2010). There are hundreds of Lepidoptera species found in the Pine Bush, including over 40 noctuid moths considered to be pine barrens specialists. A variety of regionally rare butterflies are also associated with the pitch pine–scrub oak barrens, grasslands, and other fire-maintained communities found in dry, sandy areas of the preserve. The federally endangered Karner blue butterfly typically occurs in the grassy openings in the pitch pine–scrub oak barrens; its food plant adults and larvae is the wild blue lupine (*Lupinus perennis*), which is distributed throughout the Albany Pine Bush (Forrester, Leopold, and Hafner 2005). There is increasing evidence of a distinct and rich avian community in the pine barrens ecosystems of the Albany Pine Bush (Beachy and Robinson 2008; Gifford, Deppens, and Bried 2010), and the site has been designated as a New York State Bird Conservation Area.

Nottingham Serpentine Barrens

The Nottingham Park Serpentine Barrens are composed of shallow serpentine rock outcrops and unique vegetation communities, especially serpentine grassland and open savanna communities. The park is located on the outskirts of Philadelphia in Chester County, Pennsylvania (Figure 1). The pine savanna and prairie ecosystems are especially species rich, supporting diverse warm-season grasses. The site contains some of the greatest numbers of endemic, rare, characteristic, and disjunct species found on serpentine soils within the Piedmont physiographic province. Recent surveys have confirmed the presence of at least 21 globally or state-rare plant species, including one of the largest populations in the world of serpentine aster (*Aster depauperatus*), which is one of the only two recognized serpentine endemics of eastern North America.

Primary geological features. Serpentine soils have been extensively studied in the United States, and historic mine sites at Nottingham provide glimpses of its underlying geology. Serpentinite is one of the most rare bedrock materials in the United States (Brooks 1987). The term "serpentine" is derived from the greenish color and pattern of the rock, which resembles that of a snake's skin. High concentrations of siderophile elements in the soils, such as chromium, nickel, and cobalt, are toxic to plants, resulting in low concentrations of calcium, nitrogen, phosphorus, and potassium, and therefore creating conditions of extremely low soil fertility. The inability of crops or other common vegetation to thrive on these soils has permitted a rare, endemic flora to flourish.

The southernmost extent of the Wisconsin ice sheet was just north of the Nottingham serpentine barrens, which provides an additional connection between the geology and biology of the site (Brooks 1987). New species established themselves in the tundra-like climatic conditions of the region during glaciation. When the ice sheet retreated, these species remained in the serpentine barrens where they likely had far fewer competitors.

Primary biological features. Serpentine barren vegetation is found on only a small fraction of serpentine outcrops; this distinctive vegetation is characterized by a diverse native grassland, with scattered pines and oaks, sclerophyllous shrubs, and a diverse herbaceous layer. From the air, these serpentine barrens appear as islands surrounded by forest and farmland of the heavily populated Piedmont. When compared with non-serpentine vegetation, serpentine plants generally display a greater tolerance of high magnesium and low calcium levels, have higher magnesium requirements for growth, have lower magnesium adsorption and greater calcium absorption, and show magnesium exclusion from leaves (Tyndall and Farr 1989).

Similar to the pitch pine–scrub oak barrens in the Albany Pine Bush, the rare communities that inhabit the serpentine barrens of Nottingham are fire dependent, and maintained by an active prescribed burning management policy. Increased fire suppression, beginning in the early 1900s, has allowed fire-intolerant species, such as Virginia pine (*Pinus virginiana*) and eastern red cedar (*Juniperus virginiana*), to increase in abundance on serpentine grasslands throughout the eastern United States (Tyndall and Farr 1989). The persistence of pitch pines in the Nottingham Barrens is unusual, and indicates that fire continued to burn parts of the Nottingham landscape throughout this historical period of fire suppression. Ongoing prescribed burning at the site provides an excellent opportunity to educate the public on the role of fire in natural ecosystem processes. Like Albany Pine Bush, the site is also host to a wide variety of birds, mammals, moths, butterflies, amphibians and reptiles including at least 33 that are rare globally or within the state. The Nottingham serpentine barrens are included within an Audubon Society of Pennsylvania Important Bird Area.

Comparative assessment

After careful evaluation of the barrens ecosystems at Albany Pine Bush Preserve and Nottingham Park, and throughout the Piedmont and Appalachians, we recommended both of these sites for designation as NNLs. Barrens are an important natural historical feature of the eastern United States that are largely under-appreciated. Once thought to be biologically depauparate, these landscapes are increasingly recognized for their rich flora and fauna, including distinctive endemic and rare species. The designations of these sites would fill a significant gap within the NNL Program. They also provide an opportunity to showcase the ecological value of fire in maintaining landscape diversity (Figure 3), and they illustrate important connections between geologic and ecologic processes.

Barrens landscapes are also highly threatened. The interplay of the underlying geologic substrates (inland sand dunes and serpentine outcrops) and the need for frequent disturbance provide an uncommon set of circumstances for the development of these ecosystems. As a result, they are easily degraded by activities such as fire suppression, and associated biological invasions of coniferous trees and exotic species (Hochman 2001; Malcolm, Bush, and Rice 2008). Unfortunately, many barrens have also been lost to development in recent centuries. The barrens sites that remain are frequently embedded in a sea of human settlements. This landscape context provides a challenge to the preservation of high-quality, natural conditions at the barren sites. However, it also provides an opportunity, as the National Park Service continues to recognize the educational and ecological importance of urban parks (Lookingbill et al. 2007; Gifford, Deppens, and Bried

Figure 3. Prescribed fire management in the Albany Pine Bush Preserve (photo courtesy Neil Gifford).

2010). Ongoing partnerships fostered by the unique land ownership aspects of the NNL program would encourage threatened sites such as these that are paramount to the nation's natural history to share information and solve problems cooperatively.

Acknowledgments

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4

Expanding Parks and Reducing Human Numbers: A Superior Alternative to Embracing the Anthropocene Era

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Introduction

Recently, the claim has been made that Earth has entered a new geological era. The Holocene has ended and the Anthropocene has begun, in which humans have become an important geochemical force, and perhaps the dominant ecological force on the planet. Moreover, conservationists are advised to embrace the Anthropocene era, in which humanity not only dominates, but rightfully dominates, the biosphere.

Now that we have entered the Anthropocene, according to Peter Kareiva, Emma Marris, and other prophets of this new dispensation, conservationists should give up outdated goals that no longer make sense. These include trying to protect all Earth's species from anthropogenic extinction; ridding wild lands of invasive species; designating wilderness areas or parks that are off limits to most human economic activities (in order to minimize human interference in relatively wild ecosystems); or managing parks with the goal of meeting ecological baselines that reflect wilder, less human-influenced ecological conditions.

Wild nature is over, we are told, if it ever existed at all. Any baseline we choose is arbitrary. As Emma Marris puts it: "A historic moment in the past" is not "the holy moment that we always have to return every piece of land to.… Not just because it's getting more and more difficult with climate change and so on, but because those baselines we have grown up with are somewhat arbitrary.… The more we learn about how much people have changed the earth over the centuries and over the millennia, the more we know that 1491 in the Americas or 1776 in Hawaii were just moments between two different human landscapes."[1]

Besides, such goals reflect a foolish desire to keep nature "pure," a misanthropic hatred of humanity, and an outmoded metaphysics that sees a sharp line between humanity and the rest of nature. We are just as much a part of nature as bluebirds or buffalo; a vacant lot or an agricultural field is just as "natural" as a remote Arctic river.

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So conservationists need new goals. According to Kareiva, in his article "What is Conservation Science?" we should protect ecosystem services for a growing human population, and do our part to accelerate economic development in a world where so many people are poor.[2] We should avoid "fencing people out" of wildlands; that is old school. Instead, we must find creative "win/win solutions" where people use resources while preserving nature. We should learn to tolerate and even appreciate invasive species, which in many cases increase local biodiversity. Similarly, we should make our peace with the extinction of species that are maladapted to the new conditions of the Anthropocene. Rather than try to save every species on Earth, or as many as possible, we should content ourselves with preserving whatever biodiversity ten or twelve billion people find useful or interesting, and which can muddle through in the new conditions humanity is creating.

I believe that conservationists should reject this bold call to selfishness and human racism. Preserving wild nature is still the heart of conservation. Sharing the landscape generously with other species remains a necessary part of any reasonable, morally justifiable land ethic. But that necessarily involves setting limits to human demands on nature, not endlessly accommodating them. It involves setting limits to the degree of human influence that is acceptable in our national parks and other wildlands. And that, in turn, limits the degree to which real conservationists can accept the dominant trends of the Anthropocene.

Rather than embrace the Anthropocene era, conservationists should try to rein in its excesses. Among our key goals, we should work to expand parks and protected areas; increase the acreage kept free from intensive human resource extraction; and lessen human impacts that degrade wildlife habitat, such as air and water pollution, and the continued transfer of exotic species into new areas. Conservationists should advocate for humane measures to reduce human numbers, gradually and non-coercively. Recognizing that humanity is bumping up against ecological limits to economic growth, conservationists should avoid any temptation to make our peace with the current endless growth economy. Instead, a central part of our agenda should involve creating a truly sustainable economy: one that recognizes limits to growth.

Above all, conservationists should affirm the right of every species on Earth to pursue its unique destiny, free from human-caused extinction. I believe such a course is morally and prudentially superior to uncritically embracing the Anthropocene era.

Acceptable and unacceptable change

I agree with Peter Kareiva and Emma Marris that we have entered the Anthropocene era. Where I part company with them is in their embrace of the Anthropocene.

Sometimes, the Anthropocene is presented as a positive good, as when Marris rhapsodizes over how much more biodiverse Los Angeles is today than it would have been one hundred or two hundred years ago, before people came and planted so many species of exotic trees; or, about the many opportunities we have to today to create new nature. According to Marris, embracing the Anthropocene is "a much more optimistic and a much more fruitful way of looking at things.... If you only care about pristine wilderness ... you're fighting a defensive action that you can never ultimately win, and every year there's less of it than there was the year before.... But if you're focused on the other values of nature and goals of nature, then you can go around creating more nature, and our kids can have a world with more nature on it than there is now."[3]

Sometimes, the Anthropocene is seen as regrettable, but inevitable. "Look, I don't like this brave new world any more than you do," some Anthropocenists say. "But you are just kidding yourself if you think this juggernaut can be stopped, or even slowed. It is a new reality to which we have to adjust, if we hope to achieve maximal conservation."

There is some truth to this: conservationists do have to make our shifts with "the way things are," if we hope to achieve conservation victories out in the real world. But conservation also

involves changing the way things are, and raising the alarm that "the way things are" will lead to great losses. Too often, proponents of the Anthropocene seem more interested in normalizing these losses than in stopping them.

For example, in 1973, the US Congress, looking at "the way things were," passed the Endangered Species Act. The ESA affirmed a national commitment to prevent any and all native species from going extinct due to human activities. The legislation specified that economic goals were not to be allowed to trump the very existence of other species.

Today, according to the US Fish and Wildlife Service, Ursos arctos, the grizzly bear, is threatened with extinction due to the effects of climate change. In fact, hundreds of thousands of species are threatened by extinction by climate change; according to the Intergovernmental Panel on Climate Change's Fourth Assessment Report: "Approximately 20–30% of species assessed so far are likely to be at increased risk of extinction if increases in global average warming exceed 1.5–2.5°C.… As global average temperature increase exceeds about 3.5°C, model projections suggest significant extinctions (40–70% of species assessed) around the globe."[4]

What do Anthropocene proponents have to say about species extinctions? Here is Peter Kareiva, in an article titled "Conservation in the Anthropocene":

> Ecologists and conservationists have grossly overstated the fragility of nature ... In many circumstances, the demise of formerly abundant species can be inconsequential to ecosystem function. The American chestnut, once a dominant tree in eastern North America, has been extinguished by a foreign disease, yet the forest ecosystem is surprisingly unaffected. The passenger pigeon, once so abundant that its flocks darkened the sky, went extinct, along with countless other species from the Steller's sea cow to the dodo, with no catastrophic or even measurable effects.[5]

About the polar bear in particular, which to many people symbolizes the threat of climate change to wild nature, Kareiva has this to say:

> Even that classic symbol of fragility—the polar bear, seemingly stranded on a melting ice block—may have a good chance of surviving global warming if the changing environment continues to increase the populations and northern ranges of harbor seals and harp seals. Polar bears evolved from brown bears 200,000 years ago during a cooling period in Earth's history, developing a highly specialized carnivorous diet focused on seals. Thus, the fate of polar bears depends on two opposing trends—the decline of sea ice and the potential increase of energy-rich prey. The history of life on Earth is of species evolving to take advantage of new environments only to be at risk when the environment changes again.[6]

Note the way Kareiva's account normalizes past extinctions and the possible extinction of the polar bear. That's just "the history of life," adapting or failing to adapt to changing conditions. Note the disappearance of any sense of human agency for the threat to the polar bear: the polar bear's fate depends on "two opposing trends" as "the environment changes"—not on whether or not humanity ratchets back greenhouse gas emissions. Finally, note the glibness with which Kareiva talks about the extinction of this magnificent beast.

Extinguishing species through the continued expansion of human economic activities is okay with Peter Kareiva, at least as long as we do not harm the "ecosystem services" upon which humanity depends for its own well-being. Well, it's not okay with me.[7] I believe that if our actions threaten to extinguish the polar bear and a large fraction of the species on Earth, then we need to change our actions. And it seems to me that any real conservationist should agree. The problem with embracing the Anthropocene is that it accepts an unacceptable status quo.

We have a choice

Thankfully, we have a choice here. It is just not true that our only path is ever further into the Anthropocene. We can instead work to ratchet back the current, excessive human footprint on Earth, and make a place (many places!) for other species to also flourish on our common home planet.

Question: Does this talk about ratcheting back the human footprint, mean that people are "bad"? That they make natural areas "impure" by their very presence? That conservationists want to return to an imaginary, Edenic past of unsullied innocence?

Answer: Of course not! People are great. Human culture, with all its achievements, is great. Cities can be great. But all of this is only great within limits.

Culture must be balanced by nature, in a well-rounded person or society. People need to limit how much habitat and other resources we consume, in order to leave enough for other species to flourish. An appreciation of limits and a recognition of the need for this balance, I think, are the key differences between those who embrace the Anthropocene and those who seek to create something better.

In any case, I insist that we have a choice in these matters: about whether or not to further the human domination of the world. Consider the conservation goals I suggested earlier:

- We can work to expand the number and size of parks and protected areas, or not. We can work, where possible, to keep biodiversity protection their primary mission, rather than resource extraction or other human economic uses.
- We can work within mixed-use "working landscapes" to prioritize biodiversity protection rather than commodity production or other human economic uses.
- We can work to lessen human impacts that degrade wildlife habitat, such as air and water pollution. (We know that Everglades National Park is not "pristine," yet we can take steps which will significantly decrease the phosphorus running into the park, or not. It is a choice.)
- We can work to stop the transfer of exotic species into new areas. (We know that international trade will continue to transfer species around the world. But we can take steps to limit those transfers, or throw up our hands. It is a choice.)
- We can work to stabilize and then reduce human numbers, gradually and non-coercively.[8] (We know that it is very likely that the human population will continue to grow over the next few decades. But the United Nations Population Fund estimates that 215 million women around the world have an unmet need for contraception; meeting that need could help reduce the projected world population in 2060 from a predicted or "most likely" 9.4 billion to 8.2 billion people instead. Conservationists can engage with population policy debates, or to continue to neglect them. It is a choice.)
- Finally, we can work to explore alternatives to the endless growth economy; or, like the proponents of the Anthropocene, we can redefine conservation in its service, and cut our goals to fit what the current, life-destroying system gives us. Here again, I affirm that conservationists have a choice. With the evidence continuing to grow that humanity is bumping up against ecological limits, even those who only care about people have good reason to begin to look for alternatives to the economic status quo. Those of us who care about wild nature have even more reason to do so.

We need to move from an economy premised on the goal of ever-more stuff for ever-more people, to an economy designed to provide a sufficiency for a limited number of people. I do not know what this will look like, in detail, and I do not mean to say that land managers and other conservationists should drop all our current efforts to preserve what wild nature we can within the

current system. However, we need to be realistic, as the Anthropocene advocates advise. There is no long-term future for wild nature under the economic status quo. Along with our current work, then, conservationists need to begin working on the transition to a truly sustainable economy: one that respects ecological limits.

Above all, those of us who care about wild nature need to affirm that it is wrong for humanity to displace and dominate nature. It is wrong to drive other species to extinction; wrong to create a world in which whether or not other species live or die depends solely on our whims, or on whether they can manage to survive in the interstices of our economic projects; wrong to further tame or displace Earth's remaining wild lands. Aldo Leopold said it well, sixty-five years ago, in *A Sand County Almanac*: "A land ethic cannot of course prevent the alteration, management and 'use' of these 'resources' [wild lands and other species], but it does affirm their right to continued existence, and, at least in spots, their continued existence in a natural state." This generous and just view must remain a cornerstone of our conservation philosophy.

Endnotes

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5

Biosphere Reserves: A New Look at Relevance to Meet Today's Challenges

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Abstract

The International Biosphere Trust, which was chartered in 2011 to support information sharing and collaboration among biosphere reserves, will collaborate with the George Wright Society and the United Nations Educational, Scientific and Cultural Organization (UNESCO) to initiate a U.S.-based information sharing project focusing on the World Network of Biosphere Reserves (WNBRs) and World Heritage sites. The WNBR now includes 610 reserves in 117 countries, with some 85 of the reserves also designated World Heritage sites. These two programs provide a wide array of ecosystem types, and social and cultural settings where people are working to solve interrelated problems such as biodiversity loss, climate change, and food and water supply. Sharing information and collaborating with people in these areas through this project will enable interested individuals and groups to contribute to and benefit from the synergy and experience of others in solving these global challenges.

Introduction

The U.S. National Research Council (NRC) report, *Our Common Journey: A Transition Toward Sustainability,* concluded that a central challenge for promoting a transition toward sustainability would be to develop an integrated and place-based understanding of the threats to sustainability, and the options for dealing with them.[1] The NRC report reflected the view that any successful quest for sustainability would be "a collective, uncertain and adaptive endeavor in which discovering where it wants to go is intertwined with how it wants to get there."[2] The World Network of Biosphere Reserves, containing 610 sites in 117 countries, including more than 85 world heritage sites, provides a wide array of places, ecosystem types, and social and cultural settings that can contribute to making this transition toward sustainability more effective and less uncertain. An information-sharing project focusing on activities in some of these areas will be initiated by the George Wright Society (GWS), in collaboration with the International Biosphere Trust (IBT). The project will contribute the GWS goal to connect people, places, knowledge and

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ideas to foster excellence in natural and cultural resources management, research, protection, and interpretation in protected natural and cultural areas.

Background

The experts who designed the biosphere reserve criteria and guidelines in 1974 emphasized that biosphere reserve establishment in different biotic regions of the world would be a way to keep options open and prevent, to the best of our ability, the depletion or destruction of the genetic diversity of life. The USA and the Soviet Union recognized the need for this project and agreed at their Summit Conference in Moscow, July 1974, to support the Man and the Biosphere Program (MAB) and to "designate certain natural areas as Biosphere Reserves for protecting valuable plant and animal genetic strains, and ecosystems, and for conducting scientific research needed for more effective actions concerned with global protection."[3]

In carrying out this important mandate the U.S. MAB Program developed effective domestic and international cooperative activities over the next five years, and this progress was recognized in 1979 by the Executive Office of the President, Offices of Science and Technology (OSTP) and Management and Budget (OMB), which issued a memorandum for heads of certain departments and agencies. It stated that MAB was "an excellent opportunity for international cooperation and provided a focus for the coordination of domestic programs aimed at improving the management of natural resources and the environment."[4] The interior and agriculture departments were directed to lead development of the domestic program, and the Department of State was directed to lead development of the international program.

With this mandate, and the clarification of agency responsibilities, progress was made in developing effective international and domestic programs over the next fifteen years, but in the mid-1990s opponents of the United Nations (UN) and some members of the U.S. Congress, alleged that biosphere reserves were part of a conspiracy by the UN and the White House to take control of lands in the U.S. This sensationalized campaign gained support in Congress even though the Congressional Research Service reported that biosphere reserves promoted communication and cooperation among a world network of areas, and that the U.S. retained full sovereignty and control over its designated areas.[5] The Deputy Assistant Secretary of State for Oceans and International Scientific Affairs testified before Congress in 1997 that the MAB Program was a component of the Administration's strategy in international diplomacy and that biosphere reserves facilitated scientific and technical exchanges that benefited both U.S. and foreign scientists and managers. He said, "Continued collaborations under MAB are of importance to the Department of State because they further the Administration's goal of fostering wise environmental stewardship around the world while at the same time strengthening relations between the U.S. and key counterpart nations."[6] In spite of this, the U.S. Congress attached amendments to appropriation bills that prohibited agencies from funding the MAB program, and it was essentially abandoned.

Hope for renewing the program came in 2003, when First Lady Laura Bush announced at the UNESCO General Conference in Paris, "The United States will once again be a full, active, and enthusiastic participant in UNESCO's important mission to promote peace and freedom, and the people of my country will work with our colleagues throughout the world to advance education, science, culture and understanding."[7] Encouraged by this pledge, I met with Mark Rey, Under Secretary of Agriculture, and asked him to allow the U.S. Forest Service, MAB co-lead agency with the National Park Service (NPS), to plan the renewal of USMAB. I agreed to organize the U.S. Biospheres Association to assist. Undersecretary Rey approved the approach, and planning began in 2004, with a meeting hosted by the Missouri Botanical Garden.

However, Henry Lamb, Chairman and founder of Sovereignty International, Inc., became aware of the plans and complained to U.S. Representative Richard Pombo, Chair of the House

Resources Committee, that the U.N. was planning to "renew its global land grab." This led Pombo to initiate an investigation of MAB, and he ordered the U.S. Forest Service to turn over all MAB records to the House Investigation Committee. I appealed to Representatives Pombo (CA) and John Duncan (TN) to conduct a fair investigation, and after several such requests they suggested that I meet with Henry Lamb to possibly resolve some of the controversy. I agreed, and from November 2005 until 2010 we met several times. To the surprise of most everyone, including members of Congress, Henry and I agreed that biosphere reserves could make significant contributions to conservation of landscapes, species, and genetic diversity in the United States, and that participation in the World Network of Biosphere Reserves would enable the U.S. to benefit from exchange with others, and improve international relations if the program had appropriate oversight by the U.S. Congress.[8] We signed an agreement to this effect, but it was not enough to convince some members of Congress. However, one positive effect was that the House Resources Committee ceased its investigation.

The situation today

Most of the 47 U.S. Biosphere Reserves have been inactive for a decade or more, and the periodic review required by UNESCO has not been done since 1995. UNESCO reminded the Office of UNESCO Affairs, U.S. Department of State, of this requirement in 2010 and again recently. The request is now being considered by the Department of State. If a decision is made that the review will not be conducted, the MAB International Coordinating Council (ICC) will be obligated to take steps to delist the U.S. Biosphere Reserves, and they will no longer be referred to as biosphere reserves. It may be possible to convince agency leaders that the review should be done, and that some of the U.S. biosphere reserves should continue to be part of the World Network. However, we should look beyond the political short sightedness that has kept the U.S. from participating in MAB in recent years, and get back to reason-based diplomacy. A start toward this goal will be to initiate an information system where interested individuals and groups in the U.S. can collaborate with other biosphere reserves, especially our neighbors, Mexico and Canada.

An opportunity

The GWS has agreed to allow the use of its website to begin an interactive information sharing project focusing on biosphere reserves. This will provide a way to keep interested individuals and groups in the U.S. involved with the growing network of biosphere reserves. A very compelling reason for doing this is that Canada and Mexico have active biosphere reserve programs, and they desire to cooperate with the U.S. to address shared transnational and trans-boundary issues, such as migratory and invasive species.

Initiating information sharing among biosphere reserves can also contribute to the growing movement to foster social financial investment in the conservation and sustainability of significant areas, such as biosphere reserves and world heritage sites. Shaun Paul, a leader in this movement, described an initiative of social capital (SOCAP) markets and the Packard Foundation to draw investor attention and interest to coastal and marine areas. There are about 150 coastal, island and marine biosphere reserves, which may have opportunities for social investment. The GWS information-sharing project should become a broker and facilitator for initiating social investments in appropriate places. This will link with the Biosphere Innovation System (BIS) started in Sweden's Biosphere Reserves and expanded to Biosphere Reserves in a several other countries. This program has inspired local business leaders to participate in achieving biosphere reserve goals.

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6

Time for a Resurrection of Biosphere Reserves?

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Although my first professional training was in a traditional forestry curriculum in the 1940s (designed mainly to produce what we called "stumpies"), fairly early on I began to appreciate what was meant by biodiversity and the need for conserving it, and gradually segued into conservation. Then the work of MacArthur and Wilson in 1967 on island biogeography captured my attention. It showed that large islands had a richer biodiversity than the smaller islands, and that the rate of species extinction was lower on the larger islands (other things being equal; MacArthur and Wilson 1967). One thing that did make a difference was the rate of replenishment through in-migration, and this depended usually on the proximity to a source—usually a large land mass. Hence, it is easier to conserve biodiversity on continental islands than on oceanic islands. This seems like common sense and pretty intuitive, but their pivotal work initiated a series of new guidelines for natural reserve design.

It soon led to one of my favorite diagrams which is derived from work by Jared Diamond (1975; see Figure 1). In summary, it suggests that big is better than small; one large park or reserve is better than several that aggregate the same area; reserves close together are better than equivalent ones widely spaced; reserves clustered are better than spread out in linear fashion; reserves connected to each other are better than separated; and in shape, the ratio of interior to perimeter is better the higher it is. To this list we must add one more: buffered from conflicting use is better than unbuffered (see Janzen 1983).

Fine studies followed on the topic of minimum viable protected area to sustain various species and their genetic integrity. An emphasis was often placed on keystone, flagship, or umbrella species, usually large carnivores, with the rationale that an area large enough for these would also conserve also most of the other biodiversity. Such studies revealed that very large areas were needed, for example, Newmark (1985) showed a loss of nearly all wide-ranging animal species in all but the largest North American park complexes. Subsequently, in East Africa he estimated that a minimum viable population of African wild dog (500 individuals) would require 100,000 km^2, a size not achieved by any East African park (Newmark 1992).

This is not to say that small reserves are without value for maintaining some species, particularly plants. A reserve that is too small for rhinoceros can be large enough for rhinoceros beetles.

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Though a reserve too small for elephants is also too small for elephant-dung beetles which need elephant dung to reproduce (Burkey 1997). And remember that an area too small to maintain large predators usually means a higher population of meso-predators that can seriously impact their smaller prey species (e.g., raccoons or possums preying upon ground-nesting birds). Therefore we generally buy into the guidelines (Figure 1) with regard to size, distribution on the land, shape, and connectivity. But what can the protected area manager or agency do about implementing these guidelines?

Figure 1. Some reserve design principles simplified (after Diamond 1975).

Enlarging the size of an existing park or reserve is difficult, with limited acquisition budgets, and complicated by landscapes occupied by humans. Likewise for shape and clustering alteration. Legal boundary changes are usually political non-starters in the USA, and extremely difficult in most other countries. A more feasible alternative would be to enlarge the *effective* area of conservation through managing the surrounding land. Promoting nature-friendly land and water management on surrounding private lands is difficult, but absolutely necessary. In surrounding lands, much native biodiversity can thrive, reserve threats can be reduced, and migration pathways can be maintained or established. This might include the following measures:

- Promoting a reduction in pesticide use, by encouraging organic farming, such as was done in the Entlebuch Biosphere Reserve (Switzerland)
- Working through education and changed laws to prohibit hunting (fishing, trapping) of rare species, e.g., viable wolf populations cannot exist within the confines of Mercantour National Park (France) if wolves are shot when they set foot beyond park boundaries
- Cooperating in fire-fighting on surrounding lands, as is done by many parks, such as Glacier National Park, U.S. National Park Service (USNPS)
- Promoting eradication of alien invasive species that threaten park ecosystems, as practiced in Hawai`i Volcanoes National Park (USNPS)
- Promoting restoration with native plants of cleared, degraded, or abandoned areas, particularly using plant species that are stressed or rare within the park (Mount Kenya World Heritage Site in Kenya, and some other Biosphere Reserves in Africa)
- Breeding and providing sheep-guarding dogs to surrounding graziers, who are experiencing problems with the large predators that are being restored within the reserve, as was done by Abruzzo National Park, Italy
- Promoting social and economic vitality, and environmental health, by "branding" an association with the reserve that has quality standards, for instance with surrounding restaurants that use locally-produced supplies (especially organic) that keep money in the community, e.g., Alpi Marittime Regional Nature Park in Italy
- Participating in the local community's planning process, for example, in Cuyahoga Valley Communities Council, participation by Cuyahoga Valley National Park (USNPS) is helping to promote a sustainable rural landscape, and the park launched a Countryside Initiative to work with farmers to maintaining agro-biodiversity and the agricultural heritage of the valley (Brown, Mitchell, and Tuxill 2003)
- Other actions which many have already instituted or planned for, such as joint celebrations, extending nature tours into park-surrounding ecosystems that are not represented in the park, etc.

The recent report of the National Park System Advisory Board Science Committee (NPSAB 2012, 14) states that, "National Park Service management strategies must be expanded to encompass a geographic scope *beyond park boundaries* to larger landscapes and to consider longer time horizons." It would certainly seem like an appropriate expenditure of park or reserve funds, or use of park volunteers, to conduct an assessment beyond park boundaries of threats to, or of the barriers or impediments that inhibit, species (and gene) movement into and out of a park. The biopermeability of the landscape surrounding the reserve should be a major concern of the management policy. This could be demonstrated by identifying crossings or underpasses for significant roads and railways, or documenting location and size of culverts and dams in waterways. Some work in this arena has been done, or is underway, for road crossings in the Crown of the Continent and in the E-CONNECT project of the Alpine Protected Areas Network in Europe. A study by the Center for the State of the Parks reported that of 54 USNPS park units, 72 percent had significant

barriers to migration in their surrounding environments (Dethloff 2010). This, of course, is aimed at the last row of "This is better than that" in Figure 1, connectivity to the nearest area that is conserved and managed for biodiversity and maintenance of ecosystem and evolutionary processes.

Gateway communities might be worthy of some special attention. These areas can be are sources of light, sound, and even air pollution that may affect the reserve, and these places may also host a concentration of park visitor accommodations. Gateway communities are portals to our most cherished public lands and a target for the increasingly popular search for rich rural living. Intervention here might take the form of not just educational outreach, but also active participation in local planning processes to reduce potential harm to park natural and cultural heritage from a gateway community's uncontrolled growth. Park staff participation in the Gateway Institute in Gatlinburg at Great Smoky Mountain National Park and Biosphere Reserve is an example.

If park and reserve biological and cultural resources are to be maintained, in the face of climate change, we must make the leap over the boundary to work at a landscape scale. The protected area must be within a matrix of nature-friendly, sustainably-managed landscape. These are just some of the questions that need to be answered:

- Does authorization now exist in the administering agency to spend official work time on issues that lie outside the limits of the protected area?
- What are the geographic limits of such activities (e.g., Can Grand Teton National Park staff extend their work to the Greater Yellowstone Ecosystem?), where does the geographic extent of park intervention stop?
- Which are the most effective measures to reduce the effects of ecological isolation and habitat fragmentation?

It would surely help provide answers to these and to other questions if we took another look at the biosphere reserve concept and program as instituted by United Nations Educational Scientific and Cultural Organization (UNESCO 1995). This provides for a designated *core zone* of protection, surrounded by a *buffer zone* where land uses and other activities are sustainable, and help protect the core area. The outermost part of a biosphere reserve is a loosely delineated *transition area*, a zone of cooperation where agriculture, forestry, recreation, and other land uses characteristic of the region are carried out in a sustainable fashion, including degraded areas for rehabilitation (see Figure 2).

In its original concept, biosphere reserves also served a research function, where the core area was considered a natural baseline, and was compared against the managed land in the buffer zone. The buffer zone "formalized" the area of positive intervention for reserve projects or program. It is also now suggested that there be new "linkage" corridors of buffer zone established to connect to any nearby biosphere reserve or other protected area.

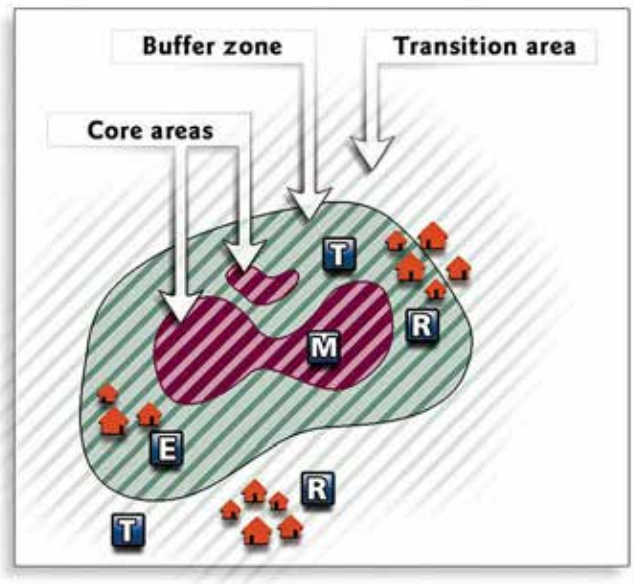
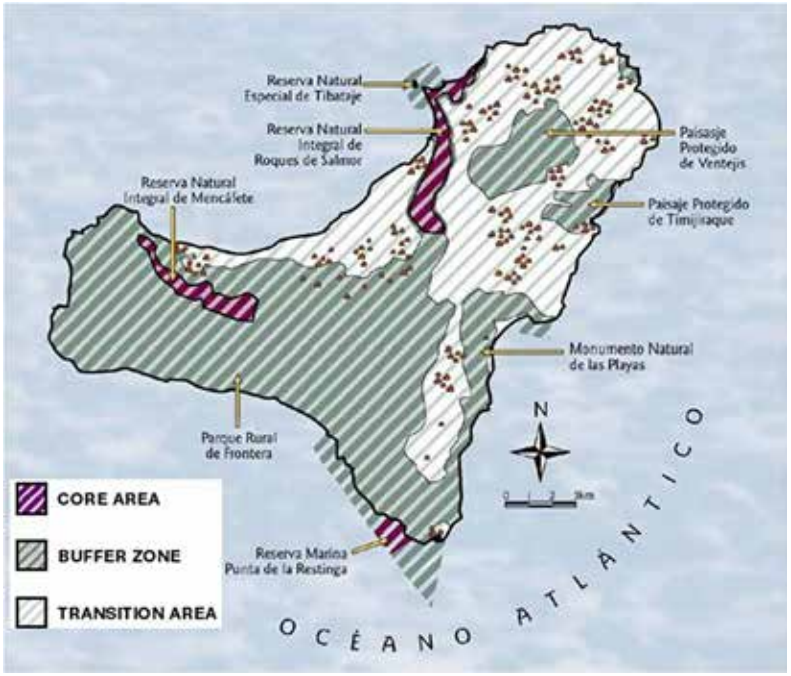


Figure 2. Model of a biosphere reserve (UNESCO).

Globally, there are now 610 biosphere reserves in 117 countries, with varying levels of performance. There exists a formal World Network of Biosphere Reserves, fostered by UNESCO/Man and Biosphere Programme. One of them, in the Canary Islands, gives a more realistic picture of an actual biosphere reserve (Figure 3).

The United States has listed 47 Biosphere Reserves, but since 1996 has not fulfilled its original commitment to have a

Figure 3. A biosphere reserve "on the ground" in Canary Islands (UNESCO).



dynamic program or to report periodically on the state of the biosphere reserves (which is called for every 10 years). Canada and Mexico both have viable programs. This contrast is surprising, since the concept of biosphere reserves had much of its origins in the USA, and Great Smoky Mountain National Park was the original "Biosphere Reserve poster child." Tom Gilbert, of the International Biosphere Trust, had much to do with the initiation of the this whole program in 1973–74. In his paper (Gilbert 2014) he briefly alludes to the politics and false information circulated about loss of US sovereignty (and even patrols by black helicopters) that effectively undermined the US Biosphere Reserve program.

In an editorial brief in *The George Wright Forum*, Diamant states: "It is easy to lose sight of the enormity of the challenge facing National Park Service in working and partnering effectively outside park boundaries" (Diamant 2012, 301). This statement applies equally to other protected areas managed by other agencies, and to other countries as well.

I, now, together with Gilbert and others, raise the question: "Is it not time to reconsider the relevance of the Biosphere Reserve in the United States as a useful way to meet the challenges faced by today's protected area managers?" If the label "buffer zone" has too much negative baggage for politicians or others, we can coin a new descriptor which delineates a zone of positive, proactive interaction with the surrounding communities to achieve a nature-friendly cultural landscape. At a minimum, we might re-activate some or all of the existing 47 Biosphere Reserves. More details about the program are available at www.unesco.org/mab.

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7

The Accokeek Foundation's Piscataway Cultural Landscape Initiative

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If you have ever traveled to George Washington's Mount Vernon, you probably remember standing on the porch, admiring the view of the river and the wooded landscape across the river, perhaps thinking "I wonder what's over there?" The answer is Piscataway Park, a national park situated on the Maryland shore of the Potomac River, about 15 miles south of the iconic monuments of Washington, DC. The park is named after the Piscataway Indians, the Eastern Woodland Indian nation that lived here at the time of first contact and still considers this land sacred.

The Accokeek Foundation (the Foundation), a non-profit founded in the late 1950s to preserve this land and the view from Mount Vernon, was instrumental in the creation of Piscataway Park in the 1960s. The Foundation stewards 200 acres of the 5000-acre park through a cooperative agreement with the National Park Service (NPS). The initial vision for preservation was to make the park a working landscape that would complement the story told at Mount Vernon. The Foundation created the National Colonial Farm to demonstrate and interpret what life was like for an ordinary small tobacco planter in Maryland on the eve of the American Revolution. Twenty years ago, this agricultural theme was extended to the contemporary story of sustainable agriculture when the Foundation created the Ecosystem Farm, an 8-acre organic vegetable farm that provides fresh produce to local families, through a Community Supported Agriculture program, and provides training to new farmers. Arguably the most significant aspect of this place, its identity as the homeland of the Piscataway people, went largely unaddressed. The Foundation has begun efforts to change this.

When Captain John Smith explored this region in 1608, he found a complex social world of Chesapeake area Indians. The map he created from his voyages shows 200 Indian towns and their names. In June of 1608, Smith came ashore in the region now encompassed by Piscataway Park, where he met the Piscataway Indians in a town called Moyaone. Moyaone was the seat of government for the Piscataway, whose territory stretched from present day Washington, D.C. to Maryland's St. Mary's County. In less than twenty-five years, this land became part of the newly chartered British colony of Maryland. As the seventeenth century progressed, one Indian nation

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after another in the Chesapeake region was dispossessed, losing land through (often illegal) sales, and through white settlers squatting on their lands.

Attacks from tribes to the north prompted the Piscataway to leave this particular piece of land. The Susquehannocks took up residence, until an attack by Virginian colonists seemed imminent during Bacon's rebellion prompted them to slip away under cover of night. Some Piscataways gave up on the region altogether, following the hereditary chief in allying themselves with the Five Nations and William Penn, and settling in a new town on the Susquehanna River. Part of the nation remained in Southern Maryland, living together in communities but, for the most part, not identifying themselves as Indian until the American Indian Movement of the 1970s. Piscataway member Turkey Tayak was a leader in that movement. He was present at the dedication of Piscataway Park in 1968, and was chosen as the leader of the first Piscataway tribal organization when it was incorporated in 1974. After his death in 1978, three separate Piscataway groups emerged: the Piscataway Indian Nation, the Piscataway-Conoy Confederacy, and the Cedarville Band of Piscataway Indians.

Five years ago, the Accokeek Foundation convened a scholarly colloquium that included presentations by scholars of indigenous history in the region, as well as by representatives of the three bands of the Piscataway Indians. At the end of the first day of the colloquium, a group of participants decided to visit the grave of Chief Turkey Tayac, who was buried in Piscataway Park thanks to congressional legislation passed in 1979. Dr. Gabrielle Tayac, Turkey's granddaughter and a scholar at the National Museum of the American Indian, described this walk: "we were walking down the boardwalk, there were three adult eagles and one juvenile flying right there... It's like we're coming back to life... We were all able to leave tobacco at the gravesite, at Turkey's gravesite. And there was this very golden light... It was a powerful moment."

Out of this momentous gathering came a commitment to work together in developing interpretative materials and programs at Piscataway Park that would reflect the culture of the Piscataway people, both in the past and in the present. The Foundation created a brochure about the Piscataway, the theme of which is "We are still here." Piscataway values became the focus of a poster for school children. These were fine efforts, but we recognized this rich history deserved much more than a brochure and poster.

Searching for what could come next, I realized that the concept of cultural landscapes could frame a much bigger effort to recognize our site's significance. Thus was born the Piscataway Cultural Landscape Initiative. With the help of Deanna Beacham's work on indigenous cultural landscapes, we identified the goal of our initiative: "to create a national model in Piscataway Park of connecting people to the environment through interpretation of the indigenous cultural landscape of the Piscataway people."

Dr. Tayac, who also sits on our Board of Trustees, describes the Accokeek Foundation's role in dealing with the enduring Piscataway presence at this place as one of sacred stewardship. As she said at the Colloquium, "The ancient chiefdom and its contemporary descendants carry forward a deeply held vow to protect the land and the ancestors sleeping near here. The environmental trust that is woven into all actions at the Accokeek Foundation broadens now to include the cultural aboriginality of this place as well. Piscataway society, as an indigenous society, was and still is one that traditionally integrates the sacred relationship to the living world in all other aspects of our lives."

The Foundation began in a small way, by weaving Piscataway culture into a tour of our Pumpkin Ash Trail, where students learn about the importance to the Piscataway of the fruit of the pawpaw tree, and the tuckahoe that grows in the wetland through which the trail winds. The Foundation received a grant from the Maryland Traditions program of the Maryland Arts Council

for a small oral history project we are currently conducting, called "Piscataway Connections to the Land." The goal of this project is to explore the cultural meanings and memories of the land for Piscataway people today. From these stories, we can begin to draw connections between twentieth century traditions of Piscataway communities in Southern Maryland, whose lives centered around agriculture, and to the contact and pre-contact era lifeways of their ancestors.

The Foundation faces several challenges as we grapple with how to translate this research into exhibits and visitor experiences on the land. The Foundation has an enormous responsibility to the Piscataway people to get this "right." How do we acknowledge contemporary Piscataway culture in a way that honors the fact that many of the ceremonies and traditions now practiced reflect a rediscovery and recovery of culture among a people who lost their language, and had to hide their identity for many generations? As we have learned from the oral histories conducted so far, the Piscataway did not acknowledge their Indian heritage until the American Indian Movement of the 1970s. While there are historical references to ceremonies and practices, these were generally written by white men. Out of necessity, descendant communities have had to infer and reconstruct these practices through the experience of tribes who did not face the challenges of white occupation until nearly two hundred years after their eastern counterparts.

How can we reflect both the historical and the contemporary Piscataway connection to mother earth on the landscape? How do we highlight this story, and weave it into the complex tapestry of history that is embedded in this land? We want to get beyond the "this is the colonial farm story, this is the American Indian story, this is the African American story, this is the contemporary agriculture story" approach to interpretation. These stories did not, and do not, happen in isolation from each other, and trying to tackle interpretive approaches in a segregated way perpetuates a kind of tension between them. Our quest is to find ways to provide visitors with a meaningful experience in the park through an inclusive, multi-layered narrative that honors all of the stories.

The Foundation has applied for funding to convene a series of cultural conversations that will draw together scholars, heritage professionals, community members, and park stakeholders in facilitated conversations that focus on three themes that are central to the current and potential visitor experience of the park: agriculture, the environment (including the river, woodlands, wildlife), and foodways. The Foundation has engaged a cultural landscape architect to help understand how they can use the landscape to put the Piscataway story front and center. As a key site on the NPS's Captain John Smith water trail, we will soon be installing an interpretive kiosk about Smith's voyage, and the story of the Piscataway people, in the context of other tribes along the Potomac. This comes at an exciting time for us, since we will soon have completed rebuilding our boat dock, making the park accessible by water.

The Piscataway Cultural Landscape Initiative is very much a work in progress. I can imagine arriving by boat, seeing interpretive signs that share the important role that the Potomac River played in the lives of Maryland's indigenous people, visiting a three sisters garden in our Museum Garden, and perhaps reading how students from Prince George's County public schools have been learning about the agricultural legacy of the Piscataway people. Walking through the many ecosystems of the Pumpkin Ash Trail, and sitting on a bench created by a native artist.

One of our board members was a part of that group that walked to Turkey Tayac's grave at the end of the first day of the scholarly colloquium that I mentioned. She couldn't attend the second day, but sent this message:

> Dear Gabrielle and all, I awoke in the middle of this night, hence this email at 2:30 am, thinking, You have an amazing story to tell, right here, right now, right here in Piscataway and it's a story about today, a real living breathing story about today. Your story ties all the pieces together of how

peoples lived here for thousands of years, and then were dispersed from their home grounds, which lead to the loss of language and identity. Yet they come back together here multiple times a year at the convergence of two rivers to celebrate, to pray, to be in physical contact with their ancestors. As we walked to Turkey Tayac's burial site, Karen pointed out plants in the estuary that are tubers once eaten by Native Americans. Gabrielle told us how her grandfather came here to collect herbs. I wanted to ask What herbs? How are they used? Rico gave us tobacco to spread over the burial site. What is the significance of tobacco? Why is it still so important?... I had no idea the site was of such spiritual and historic significance, and here it is right across from Mount Vernon and downstream from the Nation's capitol. The stories underscore two of Accokeek's themes: one being the relevance of the past to the present, and two being the need for land stewardship and preservation. What would happen if those burial grounds had been covered in an asphalt shopping mall parking lot? How much would be lost? The story about stewardship is different from the Ecosystem Farm, which is about food nourishment and healthy bodies. This story is about the need for stewardship for spiritual nourishment. The two stories are not really different, but rather perhaps one is a continuation of and connection to the other.... There's a lot that can be told here and the stories are right before us.

8

Spiritual Outcomes of Park Experience: A Synthesis of Recent Social Science Research

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Introduction

In recent years there has been increasing empirical research on park experience and spirituality. In the vast majority of these studies, participants self-define spirituality. This paper summarizes and synthesizes this recent empirical research using the behavioral model of outdoor recreation as a framework (Figure 1) that allows for the inclusion of many factors involved in the relationship between park experience and spirituality. Due to space restrictions, only 16 of these studies are reviewed and synthesized in this paper. Antecedent conditions include personal history and current circumstances, attitude and motivation, sociodemographic characteristics, and spiritual tradition. Setting components include being in nature, being away (in a different environment), and place processes, such as place attachment and place meanings. Recreation components include activity, free time, solitude, and group experiences. The paper further explains how these conditions and components may lead to outcomes of spiritual experiences, spiritual well-being, and leisure-spiritual coping. The model presented takes into account the complexity of the park experience and spirituality relationship. This research synthesis is important as it may help park managers to better understand the processes that link park experience with spiritual outcomes, and to educate park visitors about these processes.

Antecedent conditions

Antecedent conditions refer to people's characteristics prior to their park experience. Personal history and current circumstances may influence the park experience. Examples of personal history include "baggage," such as fear, that one brings to the park experience and which prevents one from being sufficiently relaxed to be open to spiritual experiences in a wilderness park setting, as noted by Fox (1997) in her study at Australia's Croajingolong National Park. Another example of personal history, identified by Foster (2012) in his study of Boundary Waters canoeists, is spiritual mentorship, which refers to how parents, relatives, friends, guides, visual media, fiction, and non-fiction may influence a person's spiritual experience in nature. A third example of personal history is Stringer and McAvoy's (1992) finding that "prior awareness of one's own spirituality," as well

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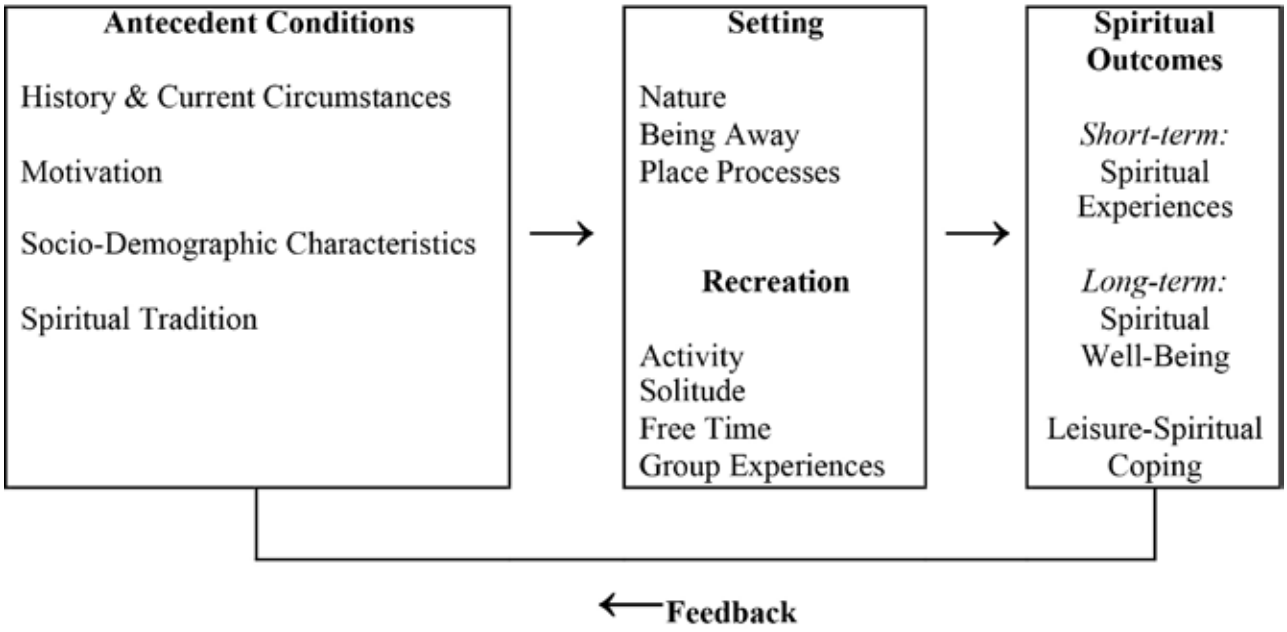

Figure 1. Park experience and spirituality outcomes.

as previous spiritual experiences, contributed to spiritual experiences during canoe and hiking trips in wilderness areas. In addition, they found that in terms of current circumstances, "needing to confront and deal with personal questions" contributed to spiritual experiences during a trip (ibid., 18).

People's motivations and attitudes regarding visiting parks can be considered antecedents. While some park visitors may not be seeking spiritual outcomes (Stringer and McAvoy 1992; Heintzman 2007), quantitative studies suggest that 46 to 82 percent of park visitors seek or experience spiritual outcomes (Brayley and Fox 1998; Heintzman 2002, 2012; Lemieux et al. 2012), although these outcomes may not be the most valued (Behan, Richards, and Lee 2001). In a qualitative study, Stringer and McAvoy found that "predisposition toward spiritual reflection and/or experience" contributed to spiritual experience (Stringer and McAvoy 1992, 18).

Sociodemographic characteristics are also considered antecedent conditions. For overnight campers at Ontario Parks in Canada, the degree to which introspection or spirituality added to satisfaction with the park experience was greater for males than for females, increased with age and education level, and decreased in households with higher incomes (Heintzman 2012). This gender difference was also true for day visitors to Ontario Parks (Heintzman 2002). Similarly, in a study of visitors to two Canadian parks, Lemieux et al. (2012) found that females rated both spiritual well-being motivations for visiting a park, and the spiritual well-being benefits received from visiting a park higher than males did, while those in the lowest- and middle-income groups tended to rate spiritual benefits higher than those in higher-income groups.

Finally, spiritual tradition should be considered. For example, for park visitors with Christian understandings of spirituality, nature is viewed as God's creation, which is entwined with their spirituality (Heintzman 2008; Foster 2012). Similarly, in a study of US national park visitor experiences, while the researcher attempted to remain open to the many deities that might be mentioned by park users, the spiritual themes were dominated by references to God and visitors related to the national park lands as a creation of God (Hoover 2012).

Setting

Park settings produce opportunities for spiritual outcomes for two main reasons. First, the natural setting of parks elicits a variety of outcomes, including a sense of wonder and awe (Fox 1997), connection with God or a higher power (Heintzman 2007, 2008), a sense of peacefulness, calm, stillness, and tranquility (Fox 1997; Heintzman 2007), therapeutic benefits (Fox 1997), and peak experiences that facilitate spiritual expression (McDonald et al. 2009). The biophysical characteristics of *bona fide* park wilderness and direct contact with nature (Fredrickson and Anderson 1999), as well as the natural backcountry setting (Marsh 2008), have been associated with spirituality. Ontario Parks camper and day visitor studies (Heintzman 2002, 2012) included statistically significant relationships between the type of park visited and the degree to which introspection and spirituality added to visitor satisfaction. Visitors at wilderness parks rated introspection and spirituality the highest, those visiting natural environments were next, while visitors at recreation parks rated it the lowest.

Second, being away appears to be as important as the natural setting for park visitors. Stringer and McAvoy (1992) observed that greater opportunities for, and enhancement of, spiritual experiences were usually ascribed to lack of constraints and responsibilities during a wilderness area visit compared with participants' everyday lives. Being away at a park has been associated with the opportunity to get away from the everyday routine to focus on spirituality (Heintzman 2007, 2008), sacredness of life (McDonald et al. 2009), and escape from information technology (Foster 2012), all of which have been associated with spirituality. Being in nature may be important for some park visitors, and being away may be significant for others, but often the combination of these two factors is conducive to spirituality (Foster 2012).

Place processes may be a third reason why park settings produce opportunities for spiritual outcomes. The spiritually inspirational characteristics of parks have been linked to the phenomena of "place attachment" and "sacred space," as visitors have developed a sense of "at-homeness" and identification with the wilderness areas they visited (Fredrickson and Anderson 1999). Also, spiritual place meanings have been associated with sacred sites by visitors at the Apostle Islands (Salk et al. 2010).

Recreation

In a study of US national park visitor experiences, spiritual themes, such as spiritual affirmation and spiritual connections, were closely associated with recreational experiences in these parks (Hoover 2012). These spiritual themes were the second-most prevalent themes after social themes.

The type of recreation activity engaged in at a park influences spirituality. While diverse park activities have been associated with spirituality (Stringer and McAvoy 1992), campers at Ontario Parks who spent most of their time at a park in nature-oriented activities rated introspection and spirituality as more important to their enjoyment than did participants who spent most of their time in activities such as biking and motor-boating (Heintzman 2002, 2012). Similarly, Behan, Richards, and Lee (2001) found that pedestrians valued spiritual benefits more than mountain bikers did, as it was easier for non-mechanized travelers to focus on nature.

The intensity of a recreation activity during a park visit may also influence spirituality. The physical challenge of canoeing in the Boundary Waters and hiking in the Grand Canyon (Fredrickson and Anderson 1999), adventure, and mental and physical exercise (Marsh 2008) have all been associated with spirituality.

The type of spiritual outcome may also be influenced by the type of park activity engaged in. Canoeists have been found to have had spiritual experiences focused on interconnections

with people while mountain hikers described spiritual experiences involving appreciation of wilderness beauty (Stringer and McAvoy 1992). Canoe paddling has also been found to offer an opportunity for spiritual reflection as it provides time to consider the difference between park conditions and everyday life (Foster 2012). Solitude has led to peace, tranquility, a chance for an inner journey, time for self-reflection (Fox 1997), and renewal resulting from contemplation of life's deepest questions, which can be difficult or impossible during everyday life (Fredrickson and Anderson 1999). The importance of solitude for spirituality has also been reported by canoeists in a provincial wilderness area who participated in a solo experience (Heintzman 2007), and by backcountry adventurers (Marsh 2008). Ontario Parks campers who visited a park alone rated introspection/spirituality higher than those who visited a park with others (Heintzman 2012). In the case of group experiences in wilderness, unscheduled time in nature, when one is free to do as one chooses, has been viewed as a critical component in spiritual experiences (Stringer and McAvoy 1992).

Group experiences in wilderness areas, including the sharing of experiences, opinions, and ideas (Stringer and McAvoy 1992), working as a team (Fox 1997), "group trust and emotional support," "sharing common life changes," and a "non-competitive atmosphere" (Fredrickson and Anderson 1999), and the opportunity to discuss with others, to share stories and personal life experiences, and to have friendships and camaraderie (Heintzman 2007) have all been associated with spirituality. Conversations and discussions on one canoe trip facilitated ongoing spiritual friendships (Heintzman 2008). Being part of a male-only or female-only group has also played an important role in spiritual outcomes (Fox 1997; Fredrickson and Anderson 1999; Heintzman 2008). In some cases a balance of solitude and group experiences is helpful to spirituality (Heintzman 2007): "There is a dynamic of tension between interaction and solitude: Both enable a spiritual meaning" (Marsh 2008, 292).

Spiritual outcomes

The combination of antecedent conditions, setting, and recreation components may lead to spiritual outcomes. Spiritual experience in nature has been characterized by emotions of awe and wonderment at nature, feelings of connectedness, heightened senses, inner calm, joy, inner peace, inner happiness, and elatedness (Fox 1997), intense and often positive emotions (Stringer and McAvoy 1992), peacefulness, including peace with oneself and the world (Heintzman 2007), and religious-like or self-transcending feelings of peace and humility (Fredrickson and Anderson 1999). McDonald, Wearing, and Ponting (2009) discovered that participants' peak experiences in wilderness areas within Australian national parks facilitated the sacredness of life, meaning and purpose, and transcendent "unseen" dimensions of spirituality. Within an urban park setting, Chiesura (2003) found that the emotional dimension of park experience included feelings related to unity with oneself and unity with nature, which they described as a spiritual component of the park experience. Chiesura explained that this component reflects a need to elevate the mind and soul beyond daily thinking as well as to feel part of, and in harmony with, a larger whole. She concluded that "the tranquil atmosphere of the park inspires reflection, meditation and a general feeling of harmony between oneself and the surroundings" (ibid., 135).

Some studies suggest spiritual experiences in parks influence daily life. Fox (1997) claimed that feelings of empowerment, clarity, and inner peace led to inner strength and self-control, which affected both work life and family life by making participants feel more in control and stronger regarding relationships, roles, and personal goals. Stringer and McAvoy (1992) used post-trip interviews (i.e., 3–45 days after the trip) to conclude that wilderness experiences appeared to have some impact on participants' lives one month later. Just over half of the participants in McDonald, Wearing, and Ponting's (2009) study observed that their wilderness peak experiences

were significant in their life because the restorative elements of wilderness, such as the absence of distractions, human-made intrusions, and time constraints, along with solitude, provided time and space to think about meaning and purpose in relation to suffering, the limits of human life, and nonmaterial pleasures.

Another outcome is spiritual well-being. Lemieux et al. (2012) found that 73.4 percent of park visitors perceived spiritual well-being benefits or outcomes from connecting with nature, being inspired by nature, and seeking the meaning/purpose of life while visiting parks. The impact on spiritual well-being for men on a canoe retreat in a provincial wilderness area 5–7 months later was associated primarily with the memory and recollection of the experience and less with specific behavioral change. Development and enhancement of spiritual friendships was the main impact on spiritual well-being 8–10 months after a different men's canoe trip along a provincial waterway park (Heintzman 2008). Chiesura (2003) examined whether an urban park experience was perceived as important for the participants' general well-being. She discovered a spiritual component related to the stimulation of a spiritual connection to nature that was seen as a source of energy that enriches life.

"Leisure-spiritual coping" refers to the ways that people receive help, in the context of their leisure, from spiritual resources (e.g., higher power, spiritual practices, faith community) during periods of stress. Women who had experienced a major life change (e.g., deterioration of personal health, major career change, death of a loved one) found a canoe or hiking trip in wilderness areas provided the opportunity to leave everyday life stresses and experience spiritual rejuvenation (Fredrickson and Anderson 1999).

Conclusions

These research findings may be most beneficial to park managers in terms of their understanding of the park and spirituality relationship rather than their ability to provide specific guidance to bring about spiritual outcomes. Research indicates that the park experience and spirituality relationship is multifaceted and complex. Thus, park managers need to keep in mind this complexity and the components of the framework presented in this article. Managers should be aware of the important role that antecedent conditions play in park spiritual outcomes, and that spiritual outcomes are associated with a wide range of park recreation activities (e.g., Stringer and McAvoy 1992), but that certain activities (e.g., more nature-oriented activities) tend to be more associated with spirituality than are others (e.g., Heintzman 2002, 2012).

To some extent, research suggests that promoting spiritual outcomes among park visitors may relate more to choices that visitors make, than to management actions. However, park managers, through educational programs and materials, can empower visitors who seek spiritual outcomes to make choices that will result in these types of outcomes.

In regard to setting characteristics, the following implications are particularly relevant. First, given that nature and naturalness, as opposed to developed recreation areas, have been found to be associated with spiritual outcomes, the naturalness of a park needs to be upheld. Second, because being away in a different environment is important for spirituality, distractions and developments associated with civilization should be minimized. Third, given that spirituality tends to be associated more with nature-oriented activities (e.g., viewing or photographing nature) than with activities that are less focused on nature, providing opportunities for nature-based recreation is relevant. Fourth, since solitude in nature settings is important for spirituality (e.g., Heintzman 2012), actions to maximize solitude are encouraged. Given these implications, park management focused on maintaining solitude and naturalness, along with inclusion of spiritual outcomes in classifications of park benefits and in the use of limits of acceptable change (LAC) and similar planning frameworks, is recommended.

Some research suggests that a focus on an overall high quality of park service rather than on specific management actions may be the best strategy to enhance spiritual outcomes in park settings (Heintzman 2002, 2012). Nevertheless, as a significant positive relationship has been found between spirituality and participation in activities such as guided hikes, visiting historical/nature displays, visiting viewpoints and lookouts, and viewing or photographing nature (Heintzman 2002, 2012), provision of nature interpretation and educational opportunities by park managers may enhance spiritual outcomes. These interpretation and educational activities could also include facilitation of introspection for park users (Brayley and Fox 1998).

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9

Protecting Historical Heritage: The Commemorative Integrity Evaluation Program at Parks Canada's National Historic Sites

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Introduction

A fire rips through a historic building. Archaeological remains wash away with the erosion of the shore. Precious artifacts are stolen from a site. Such events force us to confront the loss of historic value from historic sites. But as an ongoing activity in good management, the state of our sites needs to be measured and, when there are deficiencies, corrective actions should be taken. Parks Canada's commemorative integrity evaluation program was designed to respond to this need, so that the agency would know what condition its most valuable cultural resources were in, could share this information with the public and use it to focus corrective action.

Parks Canada manages the National Program of Historical Commemoration, which has seen the designation of over 950 national historic sites across the country, as well as the commemoration of persons and events of national historic significance. Canada's national historic sites are owned by non-profit organizations, by provincial and municipal governments, by corporations and private citizens; and over a fifth are owned by the federal government. The Parks Canada Agency administers 167 national historic sites, with a mandate to protect and present these nationally significant examples of Canada's cultural heritage and foster public understanding, appreciation, and enjoyment in ways that ensure their commemorative integrity for present and future generations.[1]

The concept of commemorative integrity is enshrined in the Parks Canada Agency Act. It refers to the health and wholeness of a national historic site. It reflects the condition or state of a site when the site retains the heritage value for which it was designated. The reasons why a place is of national significance (also sometimes called the reasons for designation or commemorative intent) and the limits of the place (also known as the designated place) are identified in the designation.

The definition of commemorative integrity includes three elements.[2] To be in a state of commemorative integrity, the following must be true:

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- The resources directly related to the reasons for designation as a national historic site must not be impaired or under threat.
- The reasons for designation must be effectively communicated to the public.
- The site's other heritage values must be respected in all decisions and actions affecting the site.

Purpose of commemorative integrity evaluations

In 1994, Parks Canada adopted a cultural resource management policy.[3] This policy marked a departure in the way the agency managed cultural resources, going from an approach which was materials-focused to a values-based system. In order for this to function in practice, it became necessary to define where value lies at each site. The documents used for this are called commemorative integrity statements. For each site, the commemorative integrity statement constitutes an analysis of the resources at the site against the reasons for designation (the nationally significant values) and other historic or heritage values. In addition, a section of the document articulates heritage messages that should be communicated, including the reasons for designation, context messages around those reasons, and messages related to other heritage values.

Beginning in 1990, Parks Canada also embarked on the production of "state of the parks" reports. The objective was to share with Canadians not only performance against core government accountabilities but performance against the mandate to protect natural and cultural resources. The concept of "state of" reporting pushed Parks Canada to develop a means to quantify and report systematically on the condition of national historic sites. By the turn of the century, four reports had been produced and it was clear that a more consistent and sustainable approach to generating and reporting information was required. The commemorative integrity evaluations program was the response.[4]

The goal of the program was to produce consistent, reliable, and comprehensive information about the state of the 167 national historic sites administered by Parks Canada. This information would then be reported in the state of the parks reports, and over time has also become central to performance management in the departmental performance report.[5] The evaluations have made it possible to express the state of conservation of the national historic sites individually and as a group, as well as of individual resources and management practices within the sites.

Methodology

The design of the commemorative integrity evaluations drew directly from the definition of commemorative integrity, the format of commemorative integrity statements, and the contents of the 1994 cultural resource management policy.6 The result was a questionnaire in three sections, paralleling the three parts of the definition of commemorative integrity.

The first part of the evaluation looked at the condition of each resource at a national historic site. The list of resources was taken from the commemorative integrity statement. Analysis of condition was based not only on a resource-based definition of good, fair, and poor, but also on the historic values that were associated with each resource. For example, ruins could receive a good rating, providing that the ruinous state was a value of the place. To the extent possible, information was culled from existing records of condition, for example, through the asset management system, or the collections management database.

The second section of the questionnaire considered whether the reasons for designation, and other messages identified in the commemorative integrity statement, are effectively communicated. The criteria considered the presence and prominence of messaging, the media used, and other qualities related to communications that were required in the policy; for example, if there are mul-

tiple interpretations of a historical event, whether a range of perspectives is presented. Periodic visitor surveys provided critical information on the effectiveness of the communications efforts.

The third section of the commemorative integrity evaluations looked at whether required management policies were being followed at the site. These practices included inventorying the cultural resources and evaluating them to determine their historic value; evaluating impacts of proposed activities and, when appropriate, influencing the activities of others, for example in leases and licenses; determining whether records are kept up-to-date; and determining whether monitoring and corrective measures are undertaken.

In each of the three sections of the evaluation, ratings were given based on a good–fair–poor system (good–fair–poor was defined for each thing being evaluated). These ratings were rolled up into overall ratings in each of the three components, using a green–yellow–red system. The overall commemorative integrity for a site could be expressed as a triad of colors (e.g., green–green–green), where the three colors relate to condition of the resources, effectiveness of communications, and selected management practices, respectively. The triad of colors could also be converted to a numerical score from one to ten (Figure 1). These numerical scores were then averaged in order to express the overall state of health of the system of national historic sites. A corporate goal was established in 2008 to raise this overall numerical index from 6.0 to 6.6 by 2013.

Score	State of Commemorative Integrity
10 🟢🟢🟢	No Impairment
9 🟢🟢🟡	Minor Impairment
8 🟢🟡🟡	
7 🟡🟡🟡	
6 🟢🟢🔴	Significant Impairment
5 🟢🟡🔴	
4 🟡🟡🔴	
3 🟢🔴🔴	Major Impairment
2 🟡🔴🔴	
1 🔴🔴🔴	Severe Impairment

Figure 1. Evaluations of resource condition, communication effectiveness, and management practices are expressed as numerical scores from one to ten.

In 2001, a ten-year schedule of evaluations was established for national historic sites administered by Parks Canada. The evaluations were typically carried out over a two-day period at the site with participation from site staff, professional staff familiar with the site (for example, archaeologists and historians), and three staff from elsewhere in the organization who could bring objectivity and national consistency to the ratings. In some cases, external partners and stakeholders were also invited to participate in the evaluations.

Successes of the program

As noted above, the goals of the program were two-fold: to better understand the state of commemorative integrity at Parks Canada's national historic sites and, based on that understanding, to improve it. The program has achieved these goals. Parks Canada achieved its goal of improving the overall state of commemorative integrity, from an average of 6.1 to 6.7, ahead of schedule (Figure 2).

Many issues identified through the red rating system—particularly conservation issues—were addressed. "Is it red?" became a shorthand to describe things which were importantly in need of attention. At Inverarden House, the evaluation focused attention on a problem with mold, which was removed, and ventilation was improved. At Twin Falls Tea House, the evaluation supported improvements to the building foundation. At Jasper House, a remote archaeological site, the evaluation encouraged improved access to and views of the site. At Prince of Wales Tower, the rating results for "effectiveness of communications" indicated a need for better messaging at the site.

The commemorative integrity evaluations program created a more systematic, consistent data set about our national historic sites than had existed previously. While site staff have always had a strong understanding of what they were managing, access to consistent information about resources and practices across the system was wanting The evaluations have made it easier to look at issues from a broad perspective, rather than on a site-by-site basis.

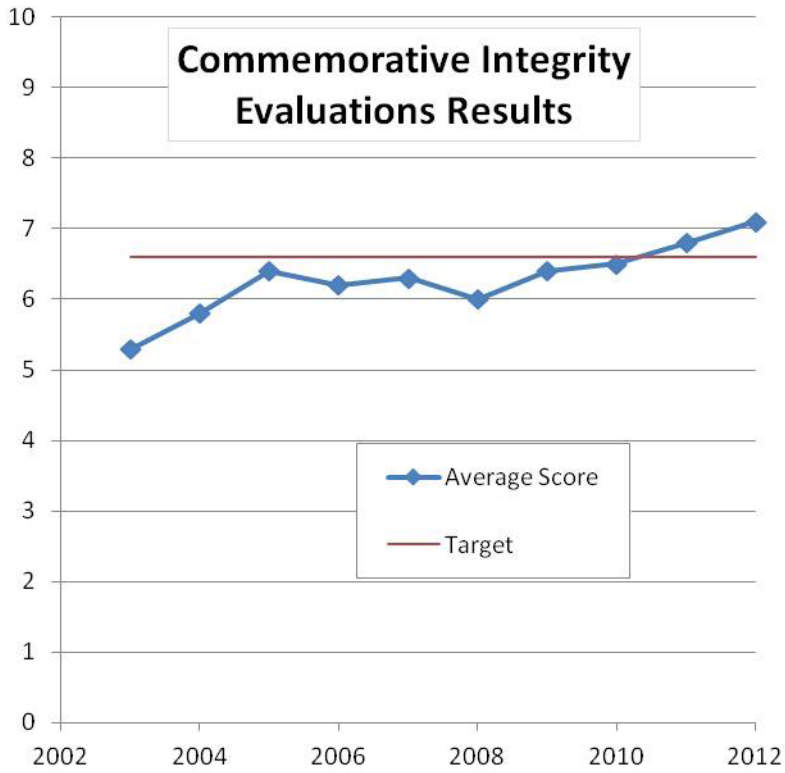

Figure 2. By focusing on results, Parks Canada achieved its goal of improving the overall state of commemorative integrity.

Though not particularly designed with continuing education in mind, the evaluations became an important means of sharing best practices in cultural resource management. The cultural resource management policy set fairly clear direction on what was expected of managers and when it was adopted; its implementation was accompanied by a relatively vigorous training program. By the time the evaluations were taking place, in part because of staff changes, the level of awareness about the requirements of the policy was not universally high. The evaluations—especially the third component, on selected management practices—proved a useful catalyst to look at what was expected, and to reflect on how it could be best implemented in the operational realities of any particular site.

The commemorative integrity evaluations were one of the few activities that allowed staff from many parts of the organization to work together on a shared project. There were opportunities to share information and perspectives from site to site, across the agency, and for the transmission of knowledge and experience from more experienced staff to those in an earlier phase of professional growth. The positive working relationships that were fostered through these experiences continue to pay dividends today.

Moving forward

While the commemorative integrity evaluations have served the agency well, all such programs deserve to be revisited periodically. The cycle of original evaluations has come to an end, and the corporate goal articulated for 2013 has been achieved. There is no doubt that the evaluations set a new standard in terms of systematically and consistently looking at cultural resources, messaging, and management practices across the agency. Notwithstanding these considerable strengths, there have been some weaknesses and, as we consider now what will come next, it is important to take stock of these, as well.

Ten years of experience with the evaluation methodology have brought to light some areas where the data could be improved. For example, in the original design there was no clear or consistent distinction between condition, per se, and the condition of historic value. While in general terms, the methodology could fully credit a ruin as being in good condition, it has not been able to reflect the distinction between a building that is structurally stable, with its original system intact, and one that is stable because its original structural system has been unsympathetically replaced with a steel skeleton. The condition of heritage value and the condition of an asset need to be more clearly distinguished.

Similarly, the methodology did not include a metric to express permanent loss of heritage value. The national historic sites program has a process to de-designate or re-list sites that have permanently lost their commemorative integrity, but the evaluations arguably should be able to reflect incremental steps towards that terminus. In other words, the program can accommodate catastrophic loss of commemorative integrity, but the evaluations do not reflect cumulative impacts.

A final methodological challenge emerged because the evaluations paid attention to every resource and rated each individually, and then rolled up those results into overall results. The results were not strictly "averaged," but were weighted by the importance of each resource under consideration. A consequence of this rolling up process was that all results tended toward the middle. Both extreme excellence and real problems were sometimes masked in a pervading cloud of middling yellow.

In December of 2012, a renewed cultural resource management policy[7] was approved. This exciting development addresses some fundamental shifts in the way we need to manage pressures on cultural resources and the agency in the twenty-first century. It sets out a new practice for cultural resource management, one that is more focused on those resources which are most closely linked to the national significance of the places we manage, more sensitive to the need to set priori-

ties, and more open to a respectful but not exhaustive approach to meeting our conservation goals. It also places a premium on the relationship between resources and how they are shared with Canadians. In comparison with these currents, the commemorative integrity evaluations program tried to do too much—to evaluate all resources, regardless of their degree of value, to include all messages and contextual messages, and to take on all the 1994 policy direction on practices and activities. Our challenge will be to hone in on what is most salient for making the critical conservation decisions in the future.

Finally, when we look outside our own borders, the world heritage dialogue about integrity provides some fresh inspiration. In the *Operational Guidelines for the Implementation of the World Heritage Convention,*[8] integrity is defined as a measure of the wholeness and intactness of the cultural heritage and its attributes (ibid., 88). In order to be considered for designation, the property or its significant attributes should be in good condition, and the impact of deterioration processes controlled. Notions of "significant proportion" and "relations and dynamic functions" (Ibid., 89) push us to think about thresholds and systems in a way that the old evaluations paradigm did not accommodate.

Conclusion

Since 2001, Parks Canada has undertaken a systematic campaign to measure, consolidate, share, and improve management of the commemorative integrity of our national historic sites. For those who have been involved, it has often been an enriching opportunity to come to know these sites more intimately, and to appreciate their value more fully. It has been a gift to work with colleagues from across the country, across functions, and across languages and professional fields, all committed to protecting and presenting these magnificent historical treasures for Canadians.

When asked what the legacy of the commemorative integrity evaluations program is, my colleagues cite its importance in putting cultural resources at the center of a structured discussion involving a range of points of view. They acknowledge its importance in bringing together a wealth of information about our national historic sites in ways that could be accessed and compared. They value its utility in bringing forward issues and trends that required further attention, and in spurring conservation action.

As we look now towards the next generation of commemorative integrity evaluations, we will build on these many strengths, while positioning a renewed approach to evaluating commemorative integrity within the current economic and social realities.

Endnotes

1. Parks Canada Agency, *Report on Plans and Priorities 2013–14* (Ottawa: Parks Canada Agency, 2013).
2. Parks Canada Agency, *Guide to the Preparation of Commemorative Integrity Statements* (Ottawa: Parks Canada Agency, 2002).
3. Department of Canadian Heritage, *Parks Canada Guiding Principles and Operational Policies* (Ottawa: Minister of Supply and Services Canada, 1994), 99–115.
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5. See for example, Parks Canada Agency, *Performance Report for the Period Ending March 31, 2008* (Ottawa: Parks Canada Agency, 2008), 41–44.
6. See references 2 and 3 above.

7. See www.pc.gc.ca/eng/docs/pc/poli/grc-crm/index.aspx.
8. United Nations Educational, Scientific and Cultural Organisation, Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage, *Operational Guidelines for the Implementation of the World Heritage Convention* (Paris: UNESCO World Heritage Centre, 2012).

10

Comanaging Parks with Aboriginal Communities: Improving Outcomes for Conservation and Cultural Heritage

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Introduction

South Australia is one of eight Australian states and territories. It covers approximately 98 million hectares and has a population of 1.65 million, of which about 1.8 percent are Aboriginal people. The South Australian formal protected area system includes over 400 parks and reserves, encompassing over 21 million hectares, or more than 21 percent of the state. Many of these areas are significant to Aboriginal people. A similar area of the state is Aboriginal freehold land. Due to its size, remoteness, and relatively intact and undeveloped condition, much of the Aboriginal freehold land can make a significant contribution to the conservation of biological diversity and natural systems in South Australia.

This paper provides a brief overview of South Australia's approach to comanagement of parks. Governance arrangements, management effectiveness, community engagement, and equity considerations are discussed, using the Vulkathunha-Gammon Ranges National Park as a case study.

Comanagement framework

In July 2004, the National Parks and Wildlife Act 1972 was amended to enable establishment of cooperative management arrangements for national parks and conservation parks in South Australia, through statutory comanagement agreements between the minister for environment and conservation, and the relevant Aboriginal group. The amendments also enabled national and conservation parks in South Australia to be constituted over Aboriginal-owned lands (Figure 1).

The changes to the National Parks and Wildlife Act created a three-tiered framework for the comanagement of Aboriginal-owned, or government-held, national parks and conservation parks:

- Aboriginal-owned parks: Aboriginal-owned national parks and conservation parks are under the control of, and managed by, comanagement boards. A comanagement board for an Ab-

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Figure 1. Comanagement arrangements enable the Australian government to hand back the freehold title to traditional lands to the traditional owners for management as parks and reserves.

original-owned park has a majority of members from the relevant Aboriginal group, and is chaired by a person nominated by the Aboriginal owners.

- Crown-owned parks managed by a comanagement board: comanagement boards may be established for Crown-owned national parks and conservation parks, in which case the board has management control of the park. Membership of a comanagement board for a Crown-owned park is determined by agreement between the minister and the traditional owners.
- Crown-owned parks with a comanagement advisory structure: a statutory advisory structure may be established for a Crown-owned national park or conservation park to provide management advice. However, it does not have management control. The functions and membership structure of an advisory committee are determined by agreement between the minister and the relevant Aboriginal group.

Ten comanagement agreements are now in place under the new arrangements. These encompass approximately 8.9 million hectares, or around 42 percent of the formal reserve system in South Australia (Figure 2).

Vulkathunha-Gammon Ranges National Park: A case study

The Vulkathunha-Gammon Ranges National Park provides a useful case study for examining the governance arrangements, management effectiveness, stakeholder involvement, and equity considerations associated with a Crown-owned park comanaged by a board under the South Australian framework. The park is located in the visually spectacular northern Flinders Ranges, approximately 750 kilometers north of Adelaide (Figure 2). It incorporates a range of arid ecosystems and habitats, supports a number of species of conservation significance, and is popular with bushwalkers and those who enjoy outdoor recreation in South Australia's distinctive "outback"

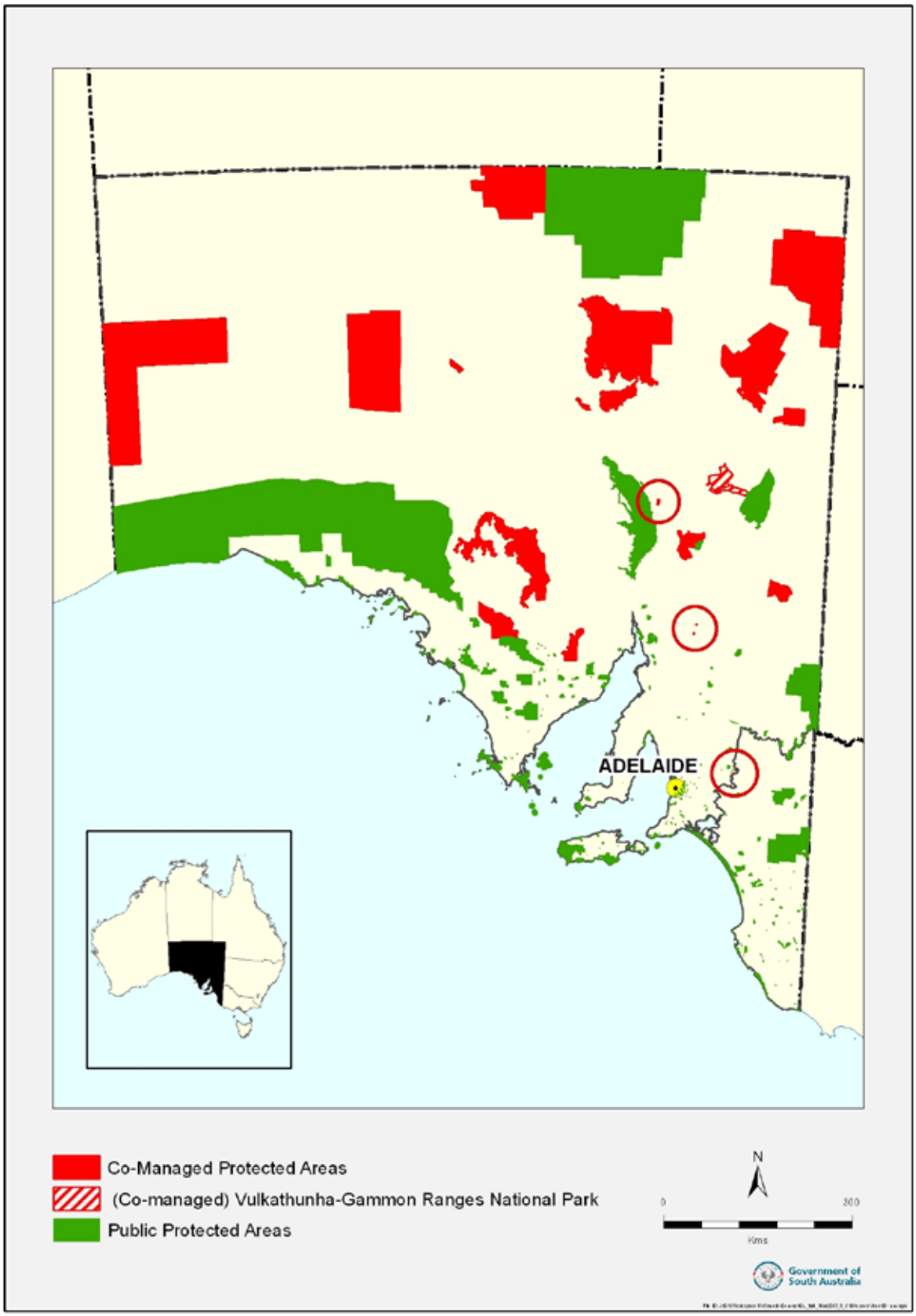

Figure 2. Comanaged protected areas in South Australia.

environment. The park is part of the traditional country of the Adnyamathanha people for whom it is of special cultural significance. It contains evidence of their past occupation, and a wide range of important cultural features, and continues to be used for traditional purposes.

Governance and institutional setting

A comanagement agreement over the Vulkathunha-Gammon Ranges National Park was signed by the state and the Adnyamathanha Traditional Lands Association in 2005. Management responsibility for the park transferred from the director of National Parks and Wildlife to the Vulkathunha-Gammon Ranges National Park Comanagement Board. Management of the park is undertaken in accordance with the National Parks and Wildlife Act, the National Parks and Wildlife (Vulkathunha-Gammon Ranges National Park) Regulations 2005, the comanagement agreement, and the park management plan.

The comanagement agreement explicitly recognizes that the quality of the natural environment in the park is due to a combination of the traditional care it has received from Aboriginal people for many thousands of years, its history as grazing land under a pastoral lease, and conservation measures applied by the state since its dedication as a park in 1970. The agreement sets out how the park will be managed, and provides for the use of the park by Adnyamathanha people in such a way that their cultural, economic, social, and environmental aspirations are enhanced in a manner consistent with the management objectives for the area. The agreement seeks to ensure that the quality of the park's natural environment is enhanced, and its cultural significance to Aboriginal people is recognized and protected (Figure 3).

The comanagement agreement is based on four principles:

- to ensure the continued enjoyment of the park by the Adnyamathanha people for cultural, spiritual, and traditional uses

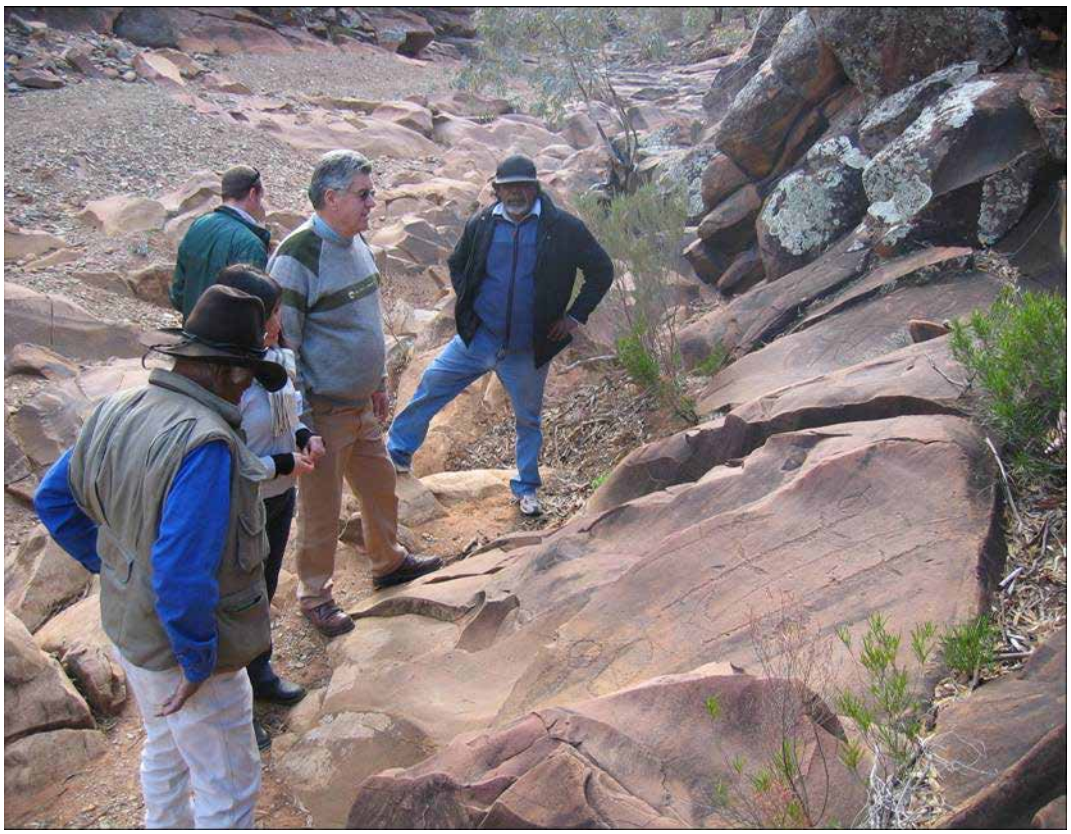

Figure 3. Comanagement arrangements have increased the focus on cultural site management in the Vulkathunha-Gammon Ranges National Park.

- to ensure the continued enjoyment of the park by members of the public
- to ensure the preservation and protection of Aboriginal sites, features, objects, and structures of spiritual or cultural significance within the park
- to provide protection for the natural resources, wildlife, vegetation, and other environmental features of the park

The comanagement board comprises eight members (plus deputies) appointed for a four-year term, with four representatives from the Adnyamathanha Traditional Lands Association, three from the Department of Environment, Water, and Natural Resources, and one other nominated by the minister. The minister appoints the chairperson from the members. The board is currently chaired by an Adnyamathanha representative. Decisions of the board are by majority, and all members, including the chair, have one vote. In the event that the board is unable to reach a decision, the matter is referred to the minister, although this situation has not arisen to date.

The board meets quarterly. Agendas are set by the chair, and all board members are encouraged to contribute to the agenda. Strategic planning is undertaken by the board on a two-year cycle to identify priorities and set forward agendas. The functions and powers of the board are set out in the National Parks and Wildlife Act and the regulations. The powers may be delegated, and many have been delegated to department staff, who undertake the day-to-day operations of the park on behalf of the board. The board is required to submit an annual budget as part of the department's budget development process each year. Funding is at the discretion of the minister and the department. However, the board may seek and apply for funds from other sources.

The comanagement agreement must be reviewed, by the minister and the Adnyamathanha Traditional Lands Association, every five years, and may be amended or varied by agreement of the parties at any time. The agreement may be terminated by the parties under certain conditions, in which case the park ceases to be comanaged, and reverts to a park under the control of the minister, and under the management of the director of National Parks and Wildlife. The minister must consult the board before introducing any new legislation into Parliament that would apply solely to the park, or significantly affect the rights or powers of the board.

Management effectiveness and evaluation

Under the National Parks and Wildlife Act, the minister must prepare a management plan for all national parks and conservation parks. The management plan must "set forth proposals in relation to the management and improvement of the reserve and the methods by which it is intended to accomplish the objectives of the Act in relation to that reserve." Once adopted, the provisions of a management plan must be carried out and no management actions may be undertaken unless they are in accordance with the management plan. In the case of a comanaged park managed by a board, the minister must prepare the management plan in collaboration with the comanagement board.

A management plan for the Vulkathunha-Gammon Ranges National Park was prepared by the comanagement board and adopted by the minister in 2006. The board must implement the management plan and prepare an annual report to the minister which addresses matters specified in the act, regulations and comanagement agreement. The minister is required to table the annual report in State Parliament.

Community engagement

The comanagement agreement for the Vulkathunha-Gammon Ranges National Park is between the minister (on behalf of the state) and the Adnyamathanha Traditional Lands Association (representing the traditional Aboriginal owners). The comanagement arrangements were developed

over an 18-month period. This was preceded by a long period, over 30 years, where the department and local park rangers developed working relationships with the traditional Adnyamathanha owners. The agreement was then signed, with the support of the local Adnyamathanha community. The comanagement agreement recognizes "that the Adnyamathanha people and the State wish to make a significant contribution towards the reconciliation of Indigenous and non-Indigenous people," and that "the Adnyamathanha people have an acknowledged aspiration that the park be granted to them in freehold and continue to be managed as a national park."

The National Parks and Wildlife Act requires public consultation on management plans. The broader community and stakeholders were actively engaged in developing the 2006 management plan for the park. The consultation process involved public input at the early stages, including targeted consultation with special interest groups within and outside government, followed by a statutory three-month public exhibition and consultation phase. Prior to its finalization and adoption, the plan was also reviewed by the South Australian National Parks and Wildlife Council (a statutory advisory committee to the minister representing a range of statewide interests).

The management plan includes objectives and strategies specifically aimed at involving the community in the management of the park, including neighbors, nearby communities, Adnyamathanha groups, volunteer groups, scientific institutions and researchers, and special-interest community and business groups. An important priority for the board has been developing partnerships with neighboring landholders to achieve broader landscape-scale conservation as well as cultural, tourism, and recreation outcomes. Park neighbors and the Adnyamathanha community are regularly invited to attend board meetings, and meet with the board in the park, to discuss issues of mutual interest and encourage community relationships. "Open days" are also held in the park to showcase the work of the board and engage the community. The comanagement arrangements for the park appear to have strong support from the wider community.

Equity

Funding for management of comanaged parks is provided by the South Australian government. Some costs are recouped through fees for entry, camping, and other services, commercial tourism operators, and leases and licenses. However the Vulkathunha-Gammon Ranges National Park has relatively low levels of visitation and use, so revenue is very limited. This would be the case whether or not the park was comanaged. Under the comanagement agreement, the Aboriginal owners are not required to pay entry, camping, or any other fees for the use of or access to comanaged parks for cultural purposes.

Our experience to date indicates that comanagement adds to the cost of managing a park. These costs relate to payment of (very modest) sitting fees to nongovernmental board and committee members, meeting costs (including travel and accommodation), provision of administrative and executive support to boards and committees, governance training for board members, and cultural awareness training for all board members and management staff. These costs represent a positive investment in capacity-building for both Aboriginal and non-Aboriginal board members and staff, and in relationship-building between the comanagement partners.

The comanagement agreement for the park requires that preference be given to Adnyamathanha people in park employment. The board must be consulted on the number and classification levels of employees required for the park, as well as membership of selection panels. Currently all staff who are based at and work in the park are Adnyamathanha people.

The comanagement agreement requires that all non-Adnyamathanha board members and staff who work in the park undertake cultural awareness training, as determined by the board, in consultation with the Adnyamathanha people. The minister and the board must also give preference to Adnyamathanha people when contracting for the provision of works and services

in the park. The comanagement agreement provides for access to traditional resources by the Adnyamathanha community (for example hunting and the taking of plants and eggs), subject to conservation considerations. This provides an opportunity for traditional hunting and gathering practices to continue, which can contribute to better economic, social, and health outcomes for the Adnyamathanha community.

The comanagement agreement contains specific provisions to protect Adnyamathanha culture, traditional knowledge, and intellectual property. For example, all promotional material for the park that includes Adnyamathanha cultural information must be approved by the Adnyamathanha representatives on the board prior to publication. The interpretation of Adnyamathanha culture in the park by licensed commercial tour operators also requires board approval.

The board may also make recommendations to the relevant minister with respect to the naming or renaming of features of the park, and must consider the Adnyamathanha names for features when making such recommendations. This has been an area of keen interest for the board, and further contributes to equitable management arrangements.

Summary and conclusions

The relationship to land ("country") is central to Aboriginal culture, identity, spiritual beliefs, and well-being. Access to country is critical to maintaining this relationship, and can provide additional social, health, and economic benefits for Aboriginal people. Traditional knowledge and land management practices can also inform and improve contemporary approaches to science and park management, and enhance park visitor experiences. The innovative comanagement framework established in South Australia provides the opportunity to further the reconciliation agenda, contribute to Indigenous self-determination, and help address Aboriginal disadvantage. Comanagement also provides a range of potential benefits for conservation and improved park management.

The Vulkathunha-Gammon Ranges National Park in South Australia provides a useful case study of governance, community engagement, and management and equity considerations under a successful comanagement arrangement. The South Australian Department of Environment, Water and Natural Resources is continuing to work closely with Aboriginal people to identify further opportunities and consider how the framework can be improved and applied to other areas of the state.

11

Protected Areas on Private Land: Shaping the Future of the Park System in Australia

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Introduction

Protected areas on private land make a significant contribution to conservation efforts. They contribute to broader protected area systems and are vital for establishing biodiversity corridors, ecological networks, and buffer zones as part of a landscape-scale approach to conservation. Acknowledging this contribution, South Australia is exploring a range of innovative measures to facilitate the further establishment of protected areas on private land. These measures aim to ensure that private protected areas are formally recognized in legislation, and meet agreed National Reserve System criteria, including protection in perpetuity.

This paper provides a brief overview of the current status of private land conservation in Australia, and describes South Australia's protected area system, and two strategic frameworks that will help shape its growth. It discusses current work underway in South Australia to develop an innovative legislative framework for establishing protected areas on private land that will put the state at the forefront of private protected area management in Australia.

Private land conservation in Australia

All Australian states and territories are increasingly recognizing the importance and value of engaging private landholders in conservation efforts to help build the National Reserve System1, and achieve landscape-scale conservation goals. There are currently two mechanisms for private land conservation in Australia. Conservation covenants are voluntary agreements between the landholder and the government to manage land for conservation outcomes. These are legally binding agreements that are registered on the land title. Over the last decade, more than 2,000 landholders have placed conservation covenants on parts of their properties, with more than half

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of these occurring in South Australia. The other mechanism for private land conservation is a voluntary, non-binding agreement, such as a sanctuary, that recognizes the intent of landowners to manage their land for conservation outcomes.

The Australian government is investing significant funds to establish private protected areas as part of its commitment to building the National Reserve System. It has done this by either providing funds to help buy land for new conservation reserves that are then privately managed for long term nature conservation, or by supporting covenanting organizations to help landholders establish perpetual conservation covenants on their land. In recent years, with funding assistance from the Australian and South Australian governments, a number of pastoral leases have been purchased by non-government organizations in the north of the state (Figure 1). The large size of these former sheep or cattle-grazing properties, from 63,000 to 420,000 ha, has made a significant contribution to the National Reserve System, particularly by protecting ecosystems that are under-represented.

The South Australian context

South Australia covers approximately 98 million ha. It has a population of around 1.65 million people, or eight percent of the Australian population. More than 70 percent of South Australians live in the state capital, Adelaide.

South Australia covers some of the most arid parts of Australia and is often referred to as "the driest state in the driest inhabited continent." Over 80 percent of the state receives an average annual rainfall of less than 250 mm. Major land uses are sheep and cattle grazing in the rangelands, conservation and natural environments (including protected areas, Aboriginal lands, and defense land), and dryland agriculture and horticulture.

While around 86 percent of South Australia is covered in native vegetation, the majority of

Figure 1. Witchelina, a 420,000 hectare protected area on private land in the north of South Australia, owned and managed by the Nature Foundation SA.

the native vegetation occurs in the rangelands and Aboriginal lands. Habitat conversion for agriculture has left only around 29 percent of native vegetation in the agricultural regions of the state. South Australia's terrestrial protected area system[1] conserves most of the remaining native vegetation in the agricultural regions, and large areas of native vegetation in the rangelands. South Australia also has a marine park network covering 44 percent of the state controlled waters.

The South Australian terrestrial protected area system

South Australia's protected area system forms part of the National Reserve System, which represents the collective efforts of all state and territory jurisdictions, the Australian government, non-government organizations, and Aboriginal land owners. The Interim Biogeographic Regionalisation for Australia[2] provides a planning framework for the National Reserve System. This divides Australia into 85 bioregions, 403 subregions, and then regional ecosystems, which number in the thousands. The National Reserve System's goal is to develop and effectively manage a comprehensive, adequate, and representative system of protected areas that conserves as many regional ecosystems as possible.

South Australia's system of terrestrial protected areas (Figure 2) covers 28 million ha, or more than 28 percent of the state, and comprises public, private, and Aboriginal-owned lands. Around 19 percent of the state's protected area system occurs on public land. This comprises 403 reserves (as of February, 2013) protected under the South Australian National Parks and Wildlife Act 1972, including 19 national parks and reserves that are co-managed with traditional Aboriginal owners. It also includes reserves protected under the Wilderness Protection Act 1992, Crown Land Management Act 2009, and Forestry Act 1950. The protected area system continues to grow through strategic acquisitions.

The state's public protected areas are complemented by an extensive system of private protected areas, encompassing nine million ha, or around 9.2 percent of the state. Private protected areas are held by private landholders and non-government organizations with an interest in conservation. These lands are afforded protection through formal Heritage Agreements under the Native Vegetation Act 1991, or as sanctuaries under the National Parks and Wildlife Act. The South Australian Government has provided considerable financial assistance to non-government conservation organizations to purchase land for private protected areas, and continues to work with those organizations with regard to their management.

South Australia's protected areas have been established largely opportunistically over the last 120 years. Despite the extensive protected area system already in place, a number of regional ecosystems are still under represented. Development of the national bioregional framework has allowed a more strategic approach over the last two decades. However, further work is required to establish a fully comprehensive, adequate and representative system.

Strategic frameworks

In 2002, the South Australian Government became the first in Australia to adopt a landscape-scale approach to conservation and incorporate the concept, termed NatureLinks, into policy and planning frameworks. The government committed to the development of a system of interconnected core protected areas, each surrounded and linked by lands managed under conservation objectives. Five broad habitat corridors were identified and incorporated into the South Australian NatureLinks Strategy (Figure 3). NatureLinks[3] provides the overarching framework for government agencies, conservation organizations, landholders, and local communities to work together to restore and manage landscapes and seascapes within the five biodiversity corridors.

South Australia's protected area strategy, Conserving Nature,[4] recognizes that it will require efforts beyond, but supported by, government to establish a fully comprehensive, adequate, and

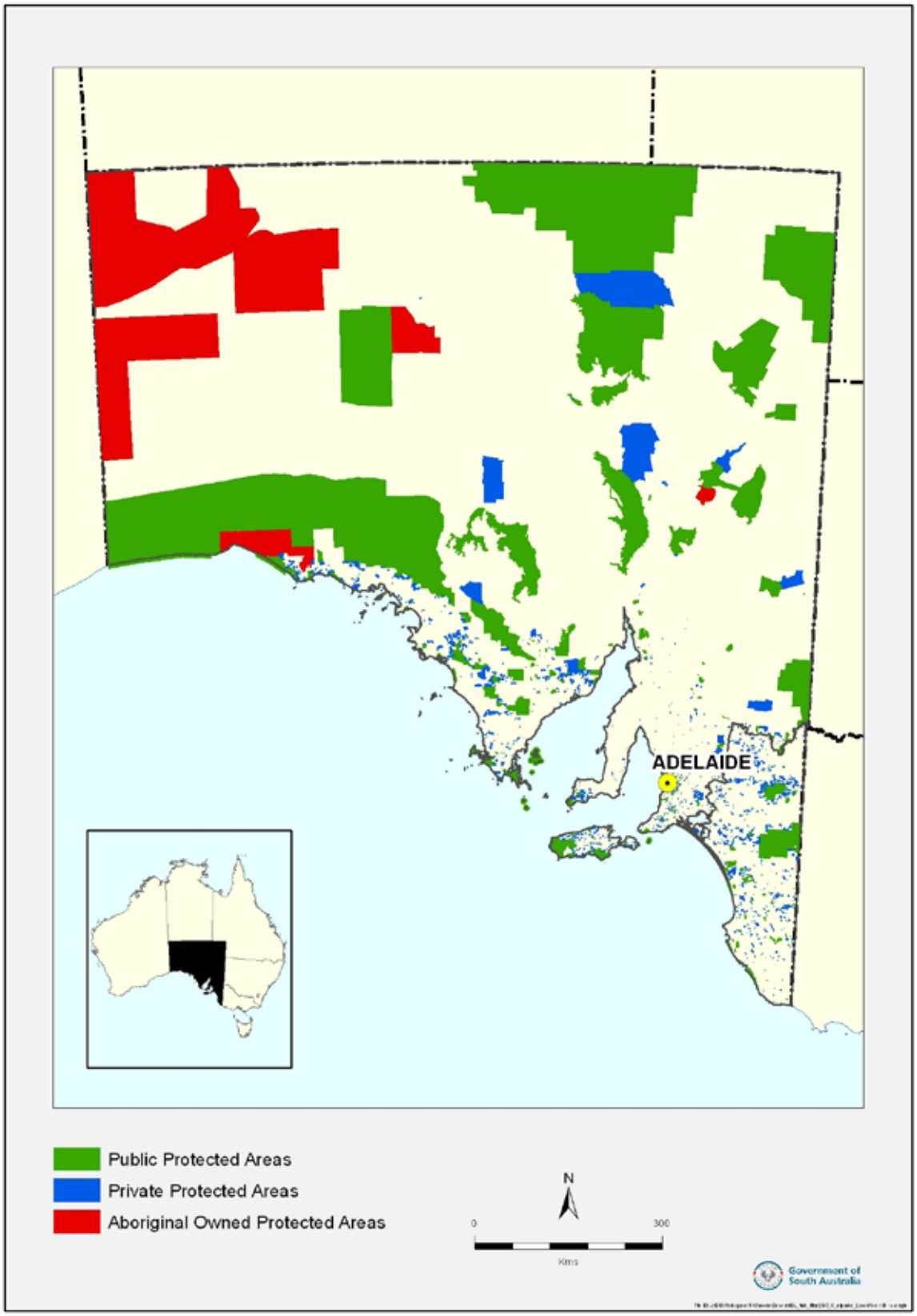

Figure 2. South Australia's protected area system.

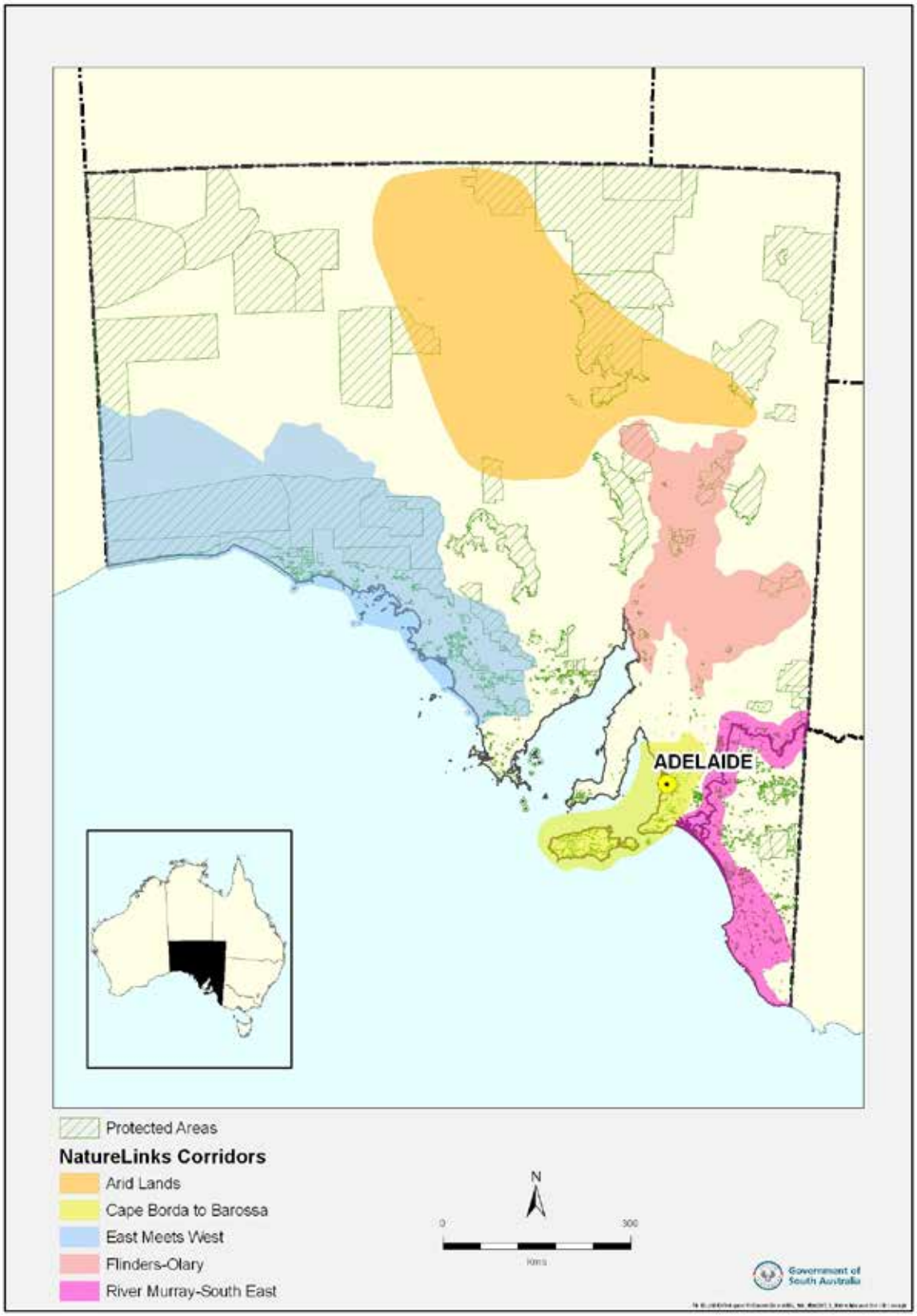

Figure 3. South Australia's NatureLinks corridors.

representative protected area system. The strategy articulates a framework for establishing protected areas on public, private and Aboriginal lands, including a priority to establish protected areas that will increase habitat connectivity across the landscape in accordance with NatureLinks principles.

A new framework for protected areas on private lands

In 2010, South Australia began developing a framework to provide a range of mechanisms for establishing and managing protected areas on private lands. The main objective was to make it easier for private landholders and conservation organizations to achieve their own conservation goals, while also making an effective formal contribution to the long-term protection of the state's biodiversity. This work culminated in the release of a draft framework for protected areas on private land for stakeholder consultation in 2011.[5] The framework includes two previously existing mechanisms (sanctuaries and heritage agreements) and proposes two new mechanisms.

Sanctuaries

There are currently 84 sanctuaries in South Australia. The largest is the Arkaroola Protection Area (under the Arkaroola Protection Act 2012) in the northern Flinders Ranges, which covers around 60,000 ha. Sanctuaries are established under the National Parks and Wildlife Act as non-binding agreements that recognize the intent of the landowner to manage the land for conservation outcomes. They are not established in perpetuity, and management activity is undertaken on a voluntary basis.

Sanctuaries provide a simple, obligation-free mechanism for landowners to manage their land for conservation outcomes. Many sanctuary owners progress to entering into heritage agreements. Feedback on the draft framework indicated strong support for retaining this mechanism as a valuable, entry level point into conservation on private land.

Heritage agreements

In 1980 South Australia became one of the first jurisdictions in Australia to establish a statutory conservation covenant mechanism to enable private landowners to enter in Heritage Agreements with the government to conserve and restore native vegetation on their land. There are currently over 1,500 heritage agreements in South Australia established under the Native Vegetation Act. These cover 643,000 ha of private freehold and leasehold land. Heritage agreements are registered on the land title, and remain in place when ownership is transferred. They have a focus on the conservation of native vegetation, rather than the broader protection and management of conservation values. Although not the original intent, heritage agreements fulfill National Reserve System establishment criteria, and make a valuable contribution to the National Reserve System in South Australia. Consultation on the draft framework indicated strong support for retaining heritage agreements as a valuable mechanism for ensuring long term protection of native vegetation on private land.

Updated heritage agreements

One of the proposed new mechanisms is to create an updated form of heritage agreement. This would extend the existing focus on native vegetation to include broader conservation of natural and cultural values. The new agreements would require that landowners manage consistently with, and report according to, National Reserve System standards and requirements. Feedback through the consultation process indicated support for updated heritage agreements. Stakeholders considered they would be a useful addition to the suite of mechanisms available for private land protection, particularly for landowners wanting to take a broader approach to conservation.

Private reserves

The second, and perhaps more controversial, proposed mechanism is to amend the National Parks and Wildlife Act to allow the establishment of national parks and conservation parks on private freehold and leasehold lands. Existing governance and management arrangements within the Act could be adapted to accommodate protected areas over privately owned or leased lands. To establish a park under the Act on private freehold land, the landowner would enter into an agreement with the Minister, the park would be declared and a notation would be included on the land title. Leased land, such as a pastoral lease, where the landholder does not hold underlying title would require an agreement with the Minister responsible for the National Parks and Wildlife Act and the establishment of a new form of conservation lease over the land.

Under the proposed model, national parks and conservation parks on private land would remain under the control and management of the landholder in accordance with a management plan prepared by the owner and approved by the Minister. While there was strong support for the underlying concept during public consultation, the idea of privately owned and managed "national parks" and "conservation parks" was a step too far for some. There were concerns by some non government organizations that the terminology may create confusion between their efforts and those of government, and this may affect their support and funding bases. Other stakeholders considered that national parks and conservation parks are viewed as community assets and should therefore be managed by government. Following stakeholder feedback, current thinking is to amend the proposal to maintain the underlying concept but move away from the terms "national park" and "conservation park." The term "private reserve" seems to have broader acceptance and is being considered as an alternative.

Issues

In addition to the concerns raised around the nomenclature of private reserves, there were two other issues worth highlighting. The first related to public access. There were concerns, particularly in relation to the proposed private "national parks" and "conservation parks", that there would be public expectations of visitor access and recreation opportunities. It was recognized that while some landholders may wish to offer such opportunities and benefit from them, others would prefer to avoid public access for a number of reasons including privacy, management control and potential liability. Consequently, all four mechanisms will place management decisions, such as whether to allow visitor access, solely at the discretion of the landholder and manager.

Access for mineral and petroleum exploration and extraction was the other key issue. In South Australia, mining access is regulated under mining legislation. Provisions exist to allow controlled mining access to parts of the public reserve system and this decision is made at the time of park proclamation. Private freehold and leasehold land is, however, generally available for mining access. It is proposed that a similar process would be followed for private "national parks" and "conservation parks," where the decision on whether to continue mining access would be determined at the time that the reserve was proclaimed. A regulatory process would be developed in consultation with the landowner and stakeholders to ensure that exploration and mining on private protected areas is managed sustainably and does not compromise conservation values and objectives. Both of these issues will require further consideration in developing the concept of a "private reserve."

Conclusion

South Australia has an extensive public protected area system, and has made considerable progress in facilitating and encouraging the establishment and management of protected areas outside the public system. In doing so, the state has shown a willingness to embrace and develop new

forms of governance. Arrangements are already in place for covenanting private conservation areas and co-managing Aboriginal-owned parks. The state government has also provided considerable support to private landholders to purchase land for private protected areas and continues to support management of those areas.

Further work is underway to develop an innovative framework for establishing protected areas on private lands that will strengthen conservation outcomes and provide more opportunities for private landholders to pursue conservation objectives. The extensive consultation undertaken to date has significantly benefited the process.

There is considerable value in facilitating and encouraging private protected areas to continue building the protected area system. This will not only improve conservation outcomes but will also maximize the many other benefits that protected areas provide across the broader landscape. Work is now underway to finalize the framework and develop the required legislative amendments for consideration by government.

Endnotes

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2. Department of Sustainability, Environment, Water, Population and Communities, "Australia's Bioregions (IBRA)," accessed 4 February 2013, www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra.
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4. Department of Environment and Natural Resources, *South Australia's Protected Area Strategy Conserving Nature: A strategy for establishing a system of protected areas in South Australia 2012–2020* (Adelaide: Government of South Australia, 2012).
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12

South Australia's NatureLinks Program: Successfully Integrating Protected Areas into Landscape Scale Conservation

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Landscape scale conservation is now the dominant approach for responding to the challenges of conservation, sustainable livelihoods, and climate change. Just as international efforts to conserve biodiversity have progressed from a species focus to a broader systems approach, the future of protected areas relies on their integration into broader physical, social, cultural and economic landscapes. South Australia's NatureLinks program is integrating protected areas into landscape restoration.

Two case studies illustrate different approaches to integration, with protected areas at their core. Operation Bounceback began as a government driven restoration program in the Flinders Ranges National Park, originally focusing on endangered Yellow-footed Rock-wallabies. Over the last twenty years, it has extended its focus outward to encompass a range of land tenures and involve many different stakeholders. WildEyre, on the Eyre Peninsula, is driven by a consortium of nongovernmental organizations and state agencies, with a focus on restoring private lands that surround and link protected areas.

Connectivity conservation in Australia

Internationally, protected areas are recognized as the cornerstone of our efforts to conserve biodiversity. However, they are just one tool in a suite of initiatives; nature conservation cannot be achieved by parks alone. In response to the challenges of climate change, habitat destruction and fragmentation, contemporary conservation efforts are focusing on a broader and more integrated approach to improve the connectivity and resilience of natural systems, beyond park boundaries.

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Conservation of landscape-scale connectivity has become the major approach in Australia for biodiversity conservation.

There are now a number of large-scale connectivity conservation projects underway that are helping to protect the integrity and resilience of many Australian ecosystems.[1] These projects have been initiated by the cooperative action of state government, nongovernmental organizations, industry, local communities and individuals. For many of the projects, nongovernmental organizations play the main role in raising awareness about opportunities for conservation action and for forming partnerships with other agencies and groups.

In 2012 the Australian government released the National Wildlife Corridors Plan[2] to provide a framework for retaining, restoring, and facilitating a national network of wildlife corridors. The South Australian Government has also recognized that, despite having an extensive protected area system, conservation goals cannot be achieved by protected areas alone. In 2003, the government introduced one of Australia's first and most successful landscape conservation initiatives, NatureLinks, which is one of the six foundations of Australia's national wildlife corridors network.

This paper discusses the origins of NatureLinks over a decade ago to its successful implementation on the ground now. It describes the pivotal role that protected areas have played in the success of NatureLinks using two case studies: Bounceback, a government initiated restoration program in the state's semi arid ranges; and WildEyre, a community driven restoration program on the largely agricultural Eyre Peninsula.

South Australia's protected area system

South Australia is one of eight Australian states and territories. It covers approximately 98 million hectares and has a population of 1.65 million people, or 8 percent of the Australian population. Over 80 percent of the state receives an average annual rainfall of less than 250 mm. Historic conversion for agriculture has left only 29 percent of native vegetation remaining in the state's agricultural regions.

South Australia's terrestrial protected area system occurs on public, private and Aboriginal lands, covering around 28 million ha, or over 28 percent of the state (Figure 1). The majority occurs on public land, including over 400 national parks and conservation reserves. Private protected areas cover over 9 million ha. These include Heritage Agreements with a primary focus on protecting native vegetation, co-managed parks on Aboriginal-owned land, sanctuaries and Indigenous Protected Areas.

South Australia's protected area system forms part of the Australian National Reserve System. The National Reserve System represents the collective efforts of all state and territory jurisdictions, the Australian Government, nongovernmental organizations and Aboriginal land owners. It includes more than 9,000 protected areas, on public and private lands, that cover over 11 percent of the continent.

South Australia's protected area strategy, Conserving Nature,[3] provides a framework for establishing protected areas, including a priority to establish protected areas that will increase habitat connectivity across the landscape, in accordance with NatureLinks principles. South Australia's protected area system provides the foundation for NatureLinks. The land based component conserves most of the remaining native vegetation in the agricultural regions and large areas of native vegetation in the rangelands.

NatureLinks

Over the last three decades, successive governments in South Australia have taken a progressive and flexible approach to conservation, recognizing that protected areas must be part of a broader socio economic landscape. This has led to substantial additions to the protected area system

ranging from Wilderness Protected Areas, to multiple use areas that provide for strictly regulated and managed access for mining and pastoralism.

In 2002 the incoming government committed to support the efforts of conservationists to introduce a system of protected areas, surrounded and linked by lands managed to achieve conservation objectives.[4] In 2003 the government subsequently adopted NatureLinks, a program to provide an overarching framework for government agencies, conservation organizations, landholders and local communities to work together to restore, connect, and sustainably manage natural systems and processes at landscape scales, using protected areas as the foundation stones.[5]

NatureLinks is modeled on the Tasmanian Wilderness Society's WildCountry philosophy,[6] which in turn is based on the North American Wildlands Project.[7] NatureLinks applies a long term, cross tenure approach; focuses on building community ownership for conservation; and ensures that the best available scientific, traditional, and local knowledge is shared among partners.

South Australia has incorporated the NatureLinks concept into policy and planning frameworks, ensuring that landscape ecology principles are built into State planning and natural resource management processes. In 2004 NatureLinks was included in South Australia's Strategic Plan[8] with a target to establish five biodiversity corridors across the state.

At around the same time, the South Australian government adopted an integrated approach to natural resource management, aligning policies and programs that dealt with water, soil, land management and pest species under a single statutory framework. The Natural Resources Management Act was passed in 2004, and was transformative, moving natural resource management forward by introducing a more holistic and integrated approach, with a strong focus on community ownership and partnerships.

This shift towards a community based model for natural resource management, building on the Australian Landcare movement of the 1980s and 1990s, aligns strongly with and is complementary to, the partnerships and community involvement approach that underpins NatureLinks. NatureLinks comprises five wildlife corridors: Arid Lands, Cape Borda to Barossa, East meets West, Flinders-Olary, and River Murray-South East (Figure 2). Each corridor is generally aligned with a bioregion or landscape with similar ecological and social systems and incorporates key protected areas that form the "core."

Corridor implementation plans have been released to provide governments, Natural Resource Management Boards, landholders and nongovernmental organizations with guidance for establishing NatureLinks on the ground.

Case study: Bounceback

The award winning Bounceback program was the first successful landscape-scale restoration program in Australia. Bounceback is a major contributor to the Flinders-Olary and East-meets-West NatureLinks and is located in the semi-arid Flinders, Gammon and Olary Ranges in the north of the State (Figure 3). Since European occupation in the mid-eighteen hundreds, the landscapes and biodiversity of the Ranges have been significantly altered by the impact of native and introduced plants and animals.

Bounceback started in 1992 in the iconic Flinders Ranges National Park (Figure 3). Park and wildlife managers recognized the need for on ground action, both on and off park, to aid recovery of the region's flora and fauna, in particular the Yellow-footed Rock-wallaby, a state and nationally listed threatened species. The two major components of Bounceback are integrated pest management and long term monitoring and evaluation. Major pests include European Red Foxes, Cats, Goats, European Rabbits, Kangaroos (over-abundant native species), African Boxthorn, Wheel Cactus and Pepper Tree.

Over the last twenty years, park rangers have forged partnerships with private landholders,

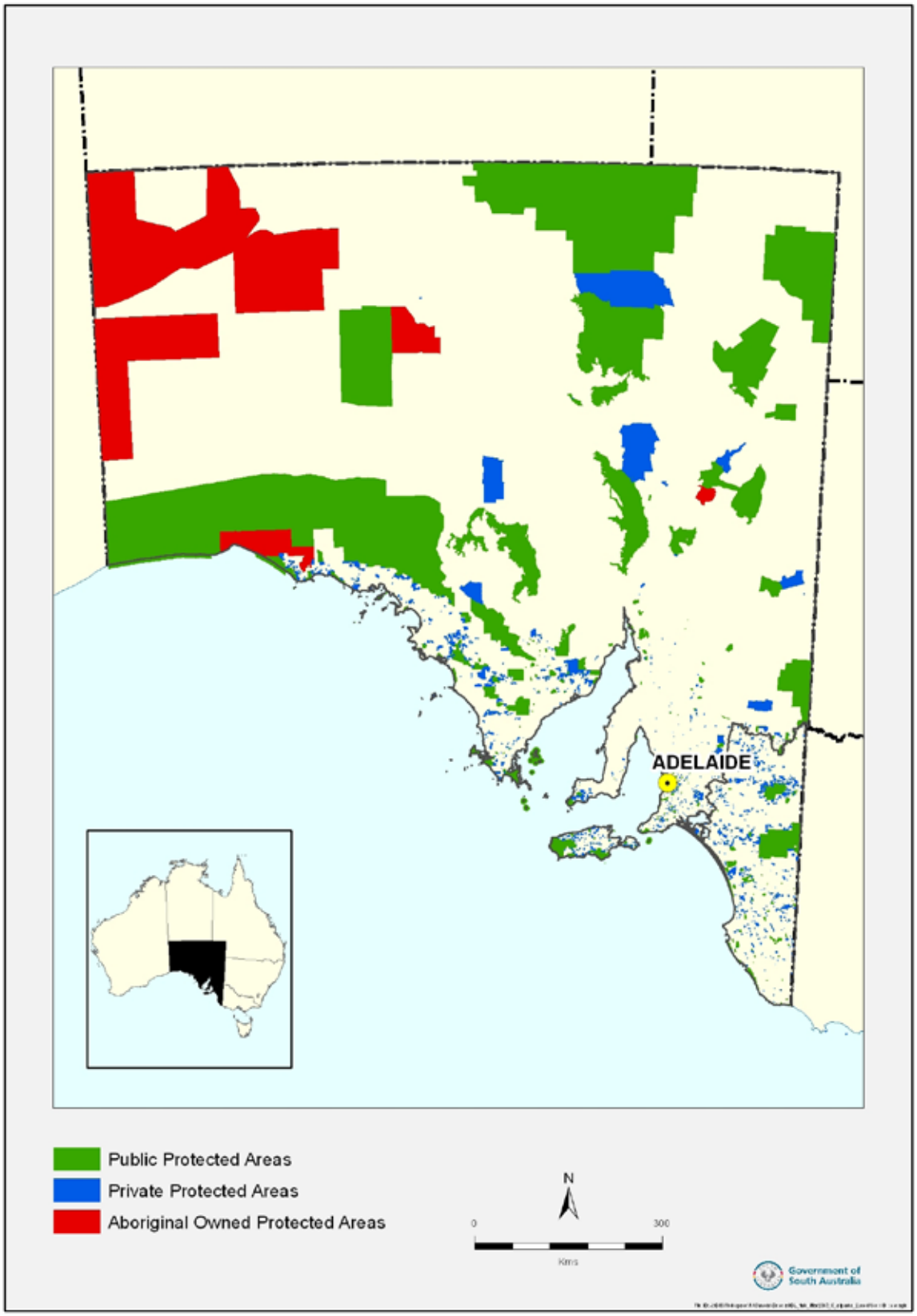

Figure 1. South Australia's protected area system.

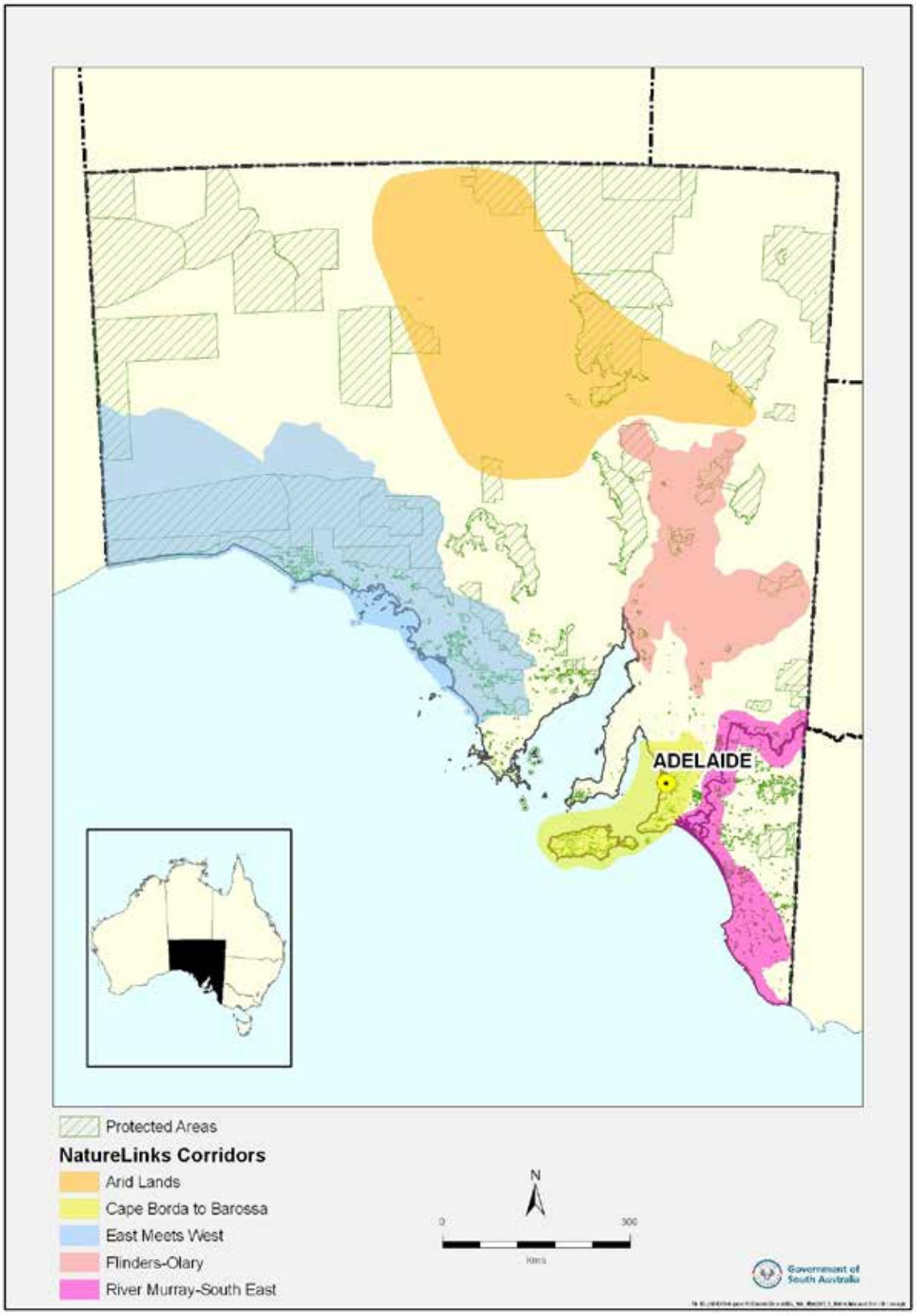

Figure 2. South Australia's NatureLinks corridors.

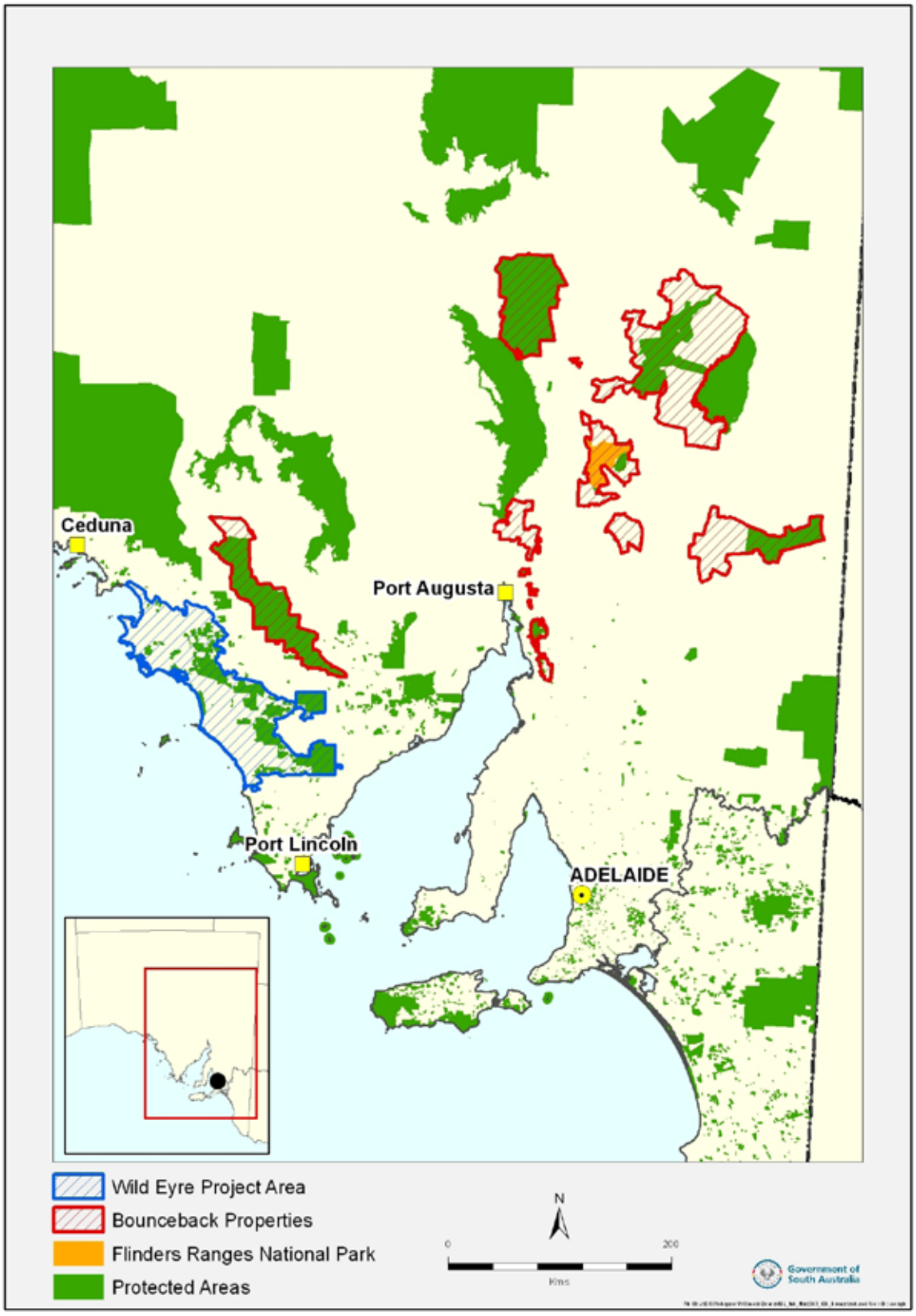

Figure 3. Location of the Bounceback and WildEyre project areas.

nongovernmental organizations, and Aboriginal communities. On the ground pest management now extends outwards from key protected areas across other land tenures, including privately managed sanctuaries, around 30 pastoral properties and Aboriginal owned and managed land. In total, Bounceback covers 10,000 sq km. More than twenty partner organizations are now involved, including conservation organizations, Aboriginal communities, hunters, and universities.

Successful results. Predation by European red foxes is believed to be the major cause of the extinction and decline of a large number of native small to medium sized terrestrial mammals, reptiles, and ground-nesting birds in Australia.[9] In the Bounceback area, fox numbers have been dramatically suppressed by aerial and complementary ground baiting (using semi-dried, sodium fluoroacetate-treated meat). Commencing in reserves in 1993, the baiting footprint has gradually expanded onto adjacent properties and then more widely as landholders have become engaged. Fox baiting now covers more than 7,000 sq km of the Bounceback project area. Fox sightings are now very low with, on average, less than one fox sighted per 100 km of spotlight transect; 10–20 foxes are observed over the same distance in unbaited areas.

Bounceback's goat control program commenced in 1992, and was one of the first programs of its kind to operate outside protected areas. Control is through a combination of coordinated and closely managed on ground and aerial shooting by volunteers, rangers, and contractors. To date, more than 140,000 goats have been removed from the project area.

Long term monitoring of land condition (based on photo point data) indicates that the reduction in total grazing pressure (from goats, rabbits, and kangaroos) has encouraged the widespread regeneration of tree and shrub species. Data from Bimbowrie Conservation Park in the Olary Ranges shows that previously grazed mulga (*Acacia* sp.) plants have, on average, doubled their height between 2006 and 2010 following reduced grazing pressure from goats. Annual population monitoring via aerial surveys indicates that Yellow-footed Rock-wallaby numbers have increased spectacularly in areas where there has been broadscale fox and goat control, both on and off reserve. Numbers in the Flinders Ranges National Park have increased from less than 30 individuals in 1993 to an estimated 1200 in 2012. In the Olary Ranges, the population has increased from less than 50 in 1993, to over 500 in 2012, with similar dramatic increases seen in other parts of the Ranges.

Summary. Bounceback is a highly effective landscape restoration program that had its origins in the protected area system. Park rangers successfully sought buy in from surrounding landholders, community groups, and other organizations to extend what began as a program to secure a threatened species on park into a landscape-scale conservation program. Reserves within the Bounceback footprint remain crucial to success by providing the core areas for long-term monitoring, and a focus for on the ground activity that will play a key role in building ecosystem resilience across all land tenures. All of Bounceback's pest control programs will require ongoing efforts and monitoring to achieve long-term benefits for biodiversity.

Case study: WildEyre

WildEyre is a landscape conservation program encompassing 1.2 million ha on the western Eyre Peninsula (Figure 3). WildEyre is a major contributor to the East meets West NatureLink (Figure 2). Major land uses in the region are dryland cropping and nature conservation. The WildEyre project area includes some of the largest intact, contiguous areas of remaining bushland in the state's agricultural regions, supporting a number of nationally threatened plant and animal species. The majority of bushland is conserved in protected areas and heritage agreements—private land is protected by a covenant under the Native Vegetation Act 1991.

WildEyre commenced in late 2007 and is driven by an alliance of three nongovernmental organizations (The Wilderness Society, Greening Australia, and the Nature Conservation Society

of South Australia), the regional Natural Resources Management Board and the South Australian Department of Environment, Water and Natural Resources. A Memorandum of Understanding guides the involvement of partners. A formal action planning process has determined agreed objectives and on ground priorities.

On ground work includes pest plant and animal control, fencing to exclude stock, extensive revegetation and bushland condition monitoring. Activity occurs across all land tenures including public and private protected areas and rural properties. Priorities are based on maximizing linkages between, and buffering, protected areas.

Successful results. Although still in its infancy, WildEyre has achieved many successes over the last five years. Pest control has focused on rabbits, foxes and key weed species identified through the action planning process as some of the highest priority threats. To date, African Boxthorn has been controlled on more than 3522 ha of coastal land.

In total, 9,600 ha of remnant vegetation have been protected from stock grazing, including 1,000 ha of threatened sheoak (*Allocasuarina* sp.) grassy woodlands on private land. This has been protected under a 10-year land stewardship agreement with two local landholders. Approximately 400 ha of public and private land have been revegetated, mainly via direct seeding. One of the private properties involved is a 13,000 ha heritage agreement owned by the Australian Wildlife Conservancy, a nongovernmental conservation organization, where the aim is to restore linkages across the property and with an adjacent Conservation Reserve.

Rigorous monitoring and evaluation will be critical to the success of WildEyre. A network of 50 monitoring sites, both on and off park, has been established with another 50 planned in the future. Based on its successes to date and the collegiate approach taken by alliance partners, WildEyre has attracted considerable funding support from both State and Federal governments. Most recently it has attracted a $4.7 million grant from the Australian Government's Clean Energy Future's Biodiversity Fund program.

Summary. WildEyre arose from a shared vision to achieve landscape scale conservation across the western Eyre Peninsula. In a unique partnership between government and nongovernmental organizations the WildEyre alliance has successfully engaged with other individuals, organizations and indigenous communities to determine priorities and deliver on ground results across public and private land. The project is driven by an action planning approach and occurs within a defined area, largely configured around the region's key protected areas.

Conclusions

NatureLinks provides an overarching planning framework to guide conservation action by government and nongovernmental organizations and the community. Two case studies, Bounceback and WildEyre, demonstrate that the shift in focus from protected areas and conservation of individual species to the sustainable management of landscapes and ecosystems is clearly working, supported by strong community networks and underpinned by an effective protected area system.

Bounceback and WildEyre illustrate quite different approaches to tackling landscape conservation. Bounceback, with its origins in the protected area system, has evolved over time with partnerships forming as the project has extended its reach beyond park boundaries to other land tenures. In contrast, WildEyre has taken a planned, tenure-blind approach, driven by an alliance of government and nongovernmental organizations from the outset. Despite their origins and approaches, both projects both depend on successful partnerships, community involvement and a core system of protected areas that provides the basis for on ground action.

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13

Using Research into the Human Dimensions of Natural Resource Management to Enhance Science-Informed Decisions

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Session overview

In an era of rapid environmental change and uncertain futures, context-specific information about how stakeholders relate to resources and resource management will become increasingly important in designing effective and durable natural resource management strategies. In this session, invited panelists provided examples of contributions from various social science disciplines to natural resource management. Discussion with the audience emphasized the social nature of preferences for park resources and management actions, potential to integrate disciplines beyond the social sciences to better understand human dimensions of natural resource issues, and future directions for human dimensions research.

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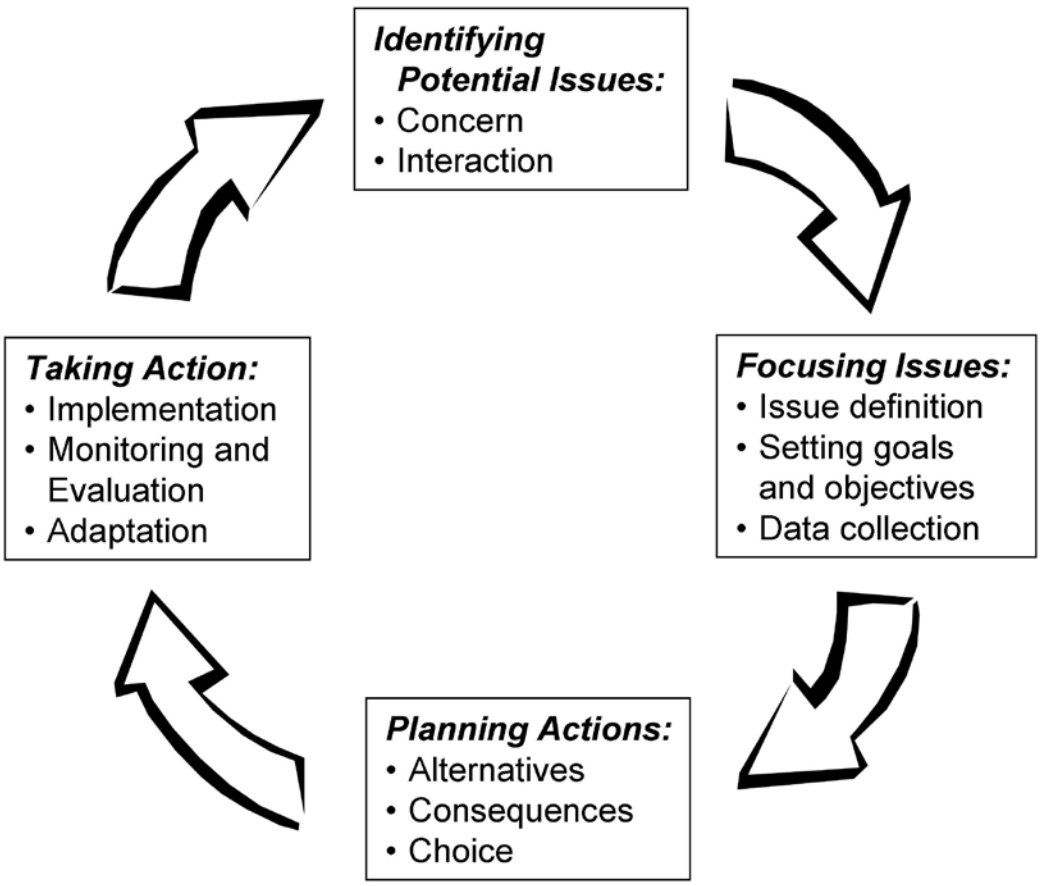
Introduction

Human dimensions are the aspects of resource management and decision-making that involve value judgments, especially around: how and why people value resources, the benefits people seek and derive from them, and how people affect and are affected by resources and their management. Human dimensions practitioners work at two main levels. They conduct research to empirically understand audiences and management contexts, drawing from an array of social science disciplines, including: sociology, anthropology, psychology, geography, and economics. In addition, they utilize this knowledge to assist in designing management interventions directed towards people, such as problem analysis, public engagement processes, and communication or behavior change strategies. To effectively diagnose and address issues and connect managers with the appropriate disciplinary experts, human dimensions specialists in natural resource management agencies must be conversant in the range of social science disciplines, methods, and how they relate to the evolution of management issues (Figure 1). Panelists represented three areas of applied disciplinary expertise to provide examples of the range of contributions from various social sciences at all stages of natural resource issue-evolution (Leong et al. 2006).

Katherine McComas: Risk perception and communication

Risk communication can take place in many venues—from the front page of the New York Times, to the Centers for Disease Control and Prevention (CDC) website, to local public meetings, the

Figure 1. The Issue-Evolution Model (reprinted with permission from Leong et al. 2006) can help guide practitioners in addressing natural resource issues as they evolve from vague concerns to full-blown issues. Human dimensions research and practice can enhance management at all stages of issue-evolution.



doctor's office, or trailheads in a national park. To better develop risk communication, it is essential to understand how risk communication influences people's attitudes and behaviors, as well as incentives and barriers people face in the context of risk communication.

One example is a current effort to develop risk messages that encourage greater awareness of the public health implications of climate change, species conservation, and biodiversity. Some of this research examines the "One Health" approach that advocates greater understanding of the linkages among human, environment, and wildlife health and well-being. One particular study that highlights how social science methods were used to examine One Health communication in national parks involved an investigation into the death of an NPS wildlife biologist in the Grand Canyon National Park (GCNP), Eric York, who died from the pneumonic plague, which he contracted from a mountain lion that he had necropsied a few days earlier (Wong et al. 2009). Soon after York's death, NPS officials began concerted efforts to communicate with GCNP employees, local residents, visitors, and media outlets about the risks of contracting plague and other zoonotic diseases at GCNP, as well as to describe efforts of NPS to protect employee, visitor, and wildlife health. No one was subsequently diagnosed with plague. Upon recommendations from epidemiological investigations, NPS enacted system-wide measures to modify employee policies, including those related to the safe handling of wild animals.

This incident identified a potential issue. In an effort to learn from it, and to improve communication to employees and visitors during future zoonotic disease-related emergencies, NPS initiated a collaborative effort with social scientists from Cornell University to understand the nature of risk communication throughout the York case. The overall goal was to analyze NPS's risk communication surrounding York's death, guided by principles and best practices outlined in the risk and crisis communication literature. To address this goal, the research team sought to understand the role of communication from the perspective of key participants. Desired outcomes were to examine communication in light of the One Health Initiative, which recognizes that animal, human, and ecosystem health are inextricably linked and should be addressed as one, and to offer guidance to park managers at GCNP and other park units for handling communication in similar incidents in the future.

To focus the issue, multiple methods were used to collect data on communication and related activities that occurred before and after York's death. These included interviews (n = 27) with individuals involved in the case, including GCNP employees, CDC officials, and journalists; media content analysis (n = 46 newspaper articles) to examine how local and national media portrayed the incident, such as whether these accounts tended to exaggerate or minimize the risk of humans contracting plague; review of internal and public NPS documents related to the case, including press releases, talking points, and investigation reports; and a two-day workshop held at GCNP to further understand the case from the perspective of those involved. Attendees were six Cornell researchers and 11 NPS affiliates representing a variety of GCNP park divisions and Washington Office programs. All were invited to recount their experiences and share their perspectives on the case.

Among outcomes of the collaborative effort were a checklist of "best practices" in communication for national park units to consider when preparing for or responding to a health risk event affecting humans and wildlife. These best practices integrated experiences from NPS with recommendations for risk communication available in the literature (especially those offered by the CDC). In addition, the results were published in the scientific literature to advance current scholarship on crisis communication offer guidance for future research (Rickard et al. 2012).

Robert Manning: Outdoor recreation management

The Park Studies Laboratory at the University of Vermont conducts a long-term program of re-

search for the NPS and other agencies. Most of this program of research employs social science theory and methods, though many studies are collaborative with natural scientists. Social science can be important in managing parks and protected areas because these areas accommodate millions of recreational visits each year, they are often embedded in or near local communities, they have important economic implications, and they are highly valued by the public. The program of research conducted by the Park Studies Laboratory is highly diverse, addressing the carrying capacity of parks and protected areas, management of outdoor recreation, analysis of trade-offs related to park management, environmental values and ethics, transportation in parks, and issues of social and environmental justice.

The Issue Evolution Model (IEM) in wildlife management is a useful conceptual framework for illustrating the ways in which social science research can contribute to park and protected area management (Hahn 1988; Leong et al. 2006). A program of social science research at Arches National Park, Utah conducted by the Park Studies Laboratory and collaborators (Manning et al. 1996; Manning 2007; Manning 2011; Manning and Anderson 2012) supported management of the park for outdoor recreation at all four "stages" of issue evolution. For example, a series of qualitative and quantitative surveys of visitors and other stakeholders helped Identify Potential Issues, the first stage of the model. These surveys asked respondents what they enjoyed most and least about their visits to Arches and to rate the importance of a number of potential issues in the park. A series of indicators of quality for the park experience were identified, including crowding at attraction sites and impacts to fragile soils and vegetation from visitors walking off maintained trails.

A subsequent survey of visitors was conducted to support the Focusing Issues stage. The objective of this survey was to develop standards of quality for the indicators of quality noted above. For example, visitors were presented with a series of visual simulations that portrayed a range of visitor use levels at park attraction sites such as Delicate Arch. At Delicate Arch, aggregate ratings of acceptability crossed into the unacceptable range at 30 people-at-one-time (PAOT) at Delicate Arch, and this was subsequently set as the minimum acceptable condition for crowding at this site.

The third stage, Planning Action, was addressed through a survey of visitors to Delicate Arch. Given that use limits were needed to maintain the standard of quality of 30 PAOT at Delicate Arch, respondents were asked to rate the acceptability of a series of management actions, such as requiring a permit to hike to Delicate Arch and limiting parking at the Delicate Arch trailhead. Ultimately, the National Park Service sized the parking lot at the trailhead to help ensure that there were never more than 30 PAOT at Delicate Arch.

The final study supported the fourth stage, Taking Action. A computer-based simulation model of visitor use of the park was developed to monitor the number of visitors at Delicate Arch and to estimate the maximum number of visitors that could be accommodated in the park per day without violating the crowding standard of quality at Delicate Arch. The model was constructed using visitor observations and counts and maps provided by visitors of their route of travel through the park.

Joe McCarter: Traditional ecological knowledge

Traditional ecological knowledge (TEK) is the cumulative body of environmental knowledge, belief and practice, held by indigenous and local people around the world (Berkes 2012). TEK accumulates over time in close contact with the environment, and as such represents the intersection between social and ecological systems. TEK can represent a deep and locally adapted source of knowledge, guides resource management over much of the world, and may be an important source of adaptive capacity to the future environmental change. Indeed, much of the world's bio-

diversity is in areas inhabited and managed by indigenous people, so TEK will continue to be critical over the coming decades (Gorenflo et al. 2012).

Social and natural scientists have used a variety of ethnographic and interview-based methods to research and describe TEK across the globe. These data, in general, show that TEK may be applicable to each stage of the Issue Evolution Model (Leong et al. 2006). In the first two stages (identifying and focusing issues), TEK may be valuable in a number of ways. For example, TEK can help to identify issues because it may encompass a rich body of knowledge about the environment, which can surpass and/or complement scientific understanding. One of the best examples comes from Micronesia, where Johannes described the rich TEK of Palauan fisherman and later demonstrated its usage for the management of marine resources (c.f., Johannes 1998). Moreover, TEK may be a useful means of re-framing issues and engaging with alternative worldviews, because it is rooted in indigenous understandings of the environment. In this context, TEK represents a "diversity of ways of thinking about problems" (Ford and Martinez 2000, 1250).

TEK can also be critical at the project planning and implementation stages. Because TEK often includes locally adapted governance mechanisms, it may be an efficient and effective means of affecting a variety of management outcomes. This has resulted in rapid growth of protected area strategies that include local and indigenous people, such as IUCN Categories V and VI and Indigenous and Community Conserved Areas. There are myriad examples of TEK being used in project planning and implementation: in one such instance, the US Fish and Wildlife Service has been working closely with indigenous elders in Alaska to form adaptive management plans for polar bears (*Ursus maritimus*) amid environmental change (Rinkevich, Greenwood, and Leonetti 2011).

TEK will be an important dimension of ongoing global conservation efforts and has a demonstrated value at each stage of the IEM. It remains to note two final points. First, any engagement with TEK from resource managers should be underpinned by a commitment to long-term and respectful partnership with TEK holders. In many indigenous communities, there are long histories of colonization and significant intellectual property concerns, and resource managers who seek to 'utilize' TEK without planning for long-term engagement may do significant harm. Second, the various strengths of TEK are inherently context specific and will be different across the globe. Therefore, engagement with TEK should be premised on deep local understanding and adjusted to the social and ecological context in which any management plan is situated.

Discussion

Presentations prompted a spirited discussion, with questions ranging from philosophical to specific resource topics. The first question asked whether all issues and threats to protected areas were ultimately social in nature. Panelists explained that while the biophysical components of protected areas are real, tangible objects, the fact that we draw boundaries around them and refer to them as "parks" is a profoundly social process that reflects conditions that society is trying to preserve. In that sense, all threats to parks are social because we define them as threats.

Audience members also were interested in the scope of disciplines covered by human dimensions, and questioned the focus on the social sciences. They asked about the role for philosophy, ethics, and analytical history in helping to think about how protected areas are valued, how those values change over time, who is included in the discussion, and potential risks of participants sharing knowledge and that knowledge being exploited (especially in the context of TEK, e.g., sharing spawning information and then being denied access to it). Panelists agreed that these disciplines bring additional insights that help us appropriately understand and incorporate different worldviews in natural resource management. But they also expressed that even the social sciences

are not yet fully integrated into management; while NPS employs natural scientists with expertise in a wide range of disciplines, it is often assumed that all social scientists are sociologists.

There were also logistical questions about conducting social science in parks, namely emerging technologies and processes for information collection approval by the Office of Management and Budget (OMB). New technologies (e.g., GPS tracking devices, internet surveys, apps, or tablets for data collection) may bring new insights, but they also may raise ethical, privacy, and policy questions. For example, is it appropriate to use technology to collect data in wilderness or with indigenous cultures? What considerations should be included to asses whether benefits outweigh costs? Emerging technologies also may not be allowed under the current OMB approval process, which was seen by session attendees to be a real barrier to conducting high quality and innovative social science research in parks. Panelists believed that legislative reform may be needed to see any change in the OMB approval process, although they recognized that the role of OMB is to ensure that data collected is necessary and serves parks.

At the same time, a number of suggestions were offered for research approaches that are under-utilized in parks. These include longitudinal studies, field experiments testing cause-and-effect relationships, and attention to relationships across or outside park boundaries. With global change, habitat fragmentation, pollution, and species migration, these trans-boundary relationships may be the biggest human dimensions problems faced by the NPS in the twenty-first century. We hope this session contributes by broadening awareness of the range of disciplines and expertise available to bring insight to these types of problems, at all stages of issue-evolution.

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Unpaid Protectors: Volunteerism and the Diminishing Role of Federal Responsibility in the National Park Service

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Introduction

Each year, unpaid volunteers are providing an increasing share of services in our national parks. By law, federal agencies are not permitted to accept the donated time of volunteers. However, special exceptions have been made for the National Park Service (NPS), and there are currently 10 volunteers for every employee in the NPS. From serving in visitor centers to assisting in resource management to conducting biological surveys, unpaid workers contribute to services central to the NPS mission.

In planning for the future of the NPS, it is critical to examine the underlying factors that are changing the way America protects its natural and cultural wonders. Simply, why has volunteerism become such a powerful force in the NPS? This paper posits that a complex and self-feeding cycle underlies the rapid adoption and continued growth of volunteerism in the national parks.

First, the Volunteers in Parks Act of 1969 established the legal grounding for a volunteer program in the NPS. Because work in the national parks is so desirable, an eager and seemingly infinite population of volunteers has arisen, willing to assist the parks. Park managers use volunteers in a variety of essential roles, and unpaid workers often fill in resource-responsibility gaps that develop in the parks. Park visitors are unaware of park funding challenges because they observe the health of the parks after volunteers have filled in resource shortfalls. The democratic feedback process is short-circuited as Congress is not pressured to increase NPS funding, and further demands are put on the parks. The result is that the resource-responsibility gap widens, more volunteers enlist, and the cycle begins again (Figure 1).

Methods

This research was conducted for a Northwestern University political science undergraduate honors thesis. Claims are informed by primary and secondary research. Data has been acquired from public records on Congressional hearings, employment statistics, and the Volunteers in Parks program. Interviews with superintendents, volunteers, volunteer coordinators, and NPS experts are used to bolster the arguments.

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Figure 1. The cycle underlying the growth of volunteerism in the national parks.

Initial infusion of volunteers

Unless otherwise specified by law, federal agencies are prohibited from accepting the work of volunteers (31 USC Sec. 1342). One such exception was created with the Volunteers in Parks Act of 1969 (16 USC Ch.1 Subch. II) which created the NPS Volunteers in Parks (VIP) program. At the time, the act was intended to provide legal protections for individuals assisting with reenactments in the parks.

During a Congressional hearing on the act, some concerns were raised about how volunteers would affect the work of full-time staff. George Hartzog, the NPS director at the time, assured lawmakers that volunteers would only carry out value-added services and the Act detailed that "the Secretary shall not permit the use of volunteers to displace any employee" (16 USC Ch.1 Subch. II, Section 18g). With little deliberation, the Volunteers in Parks Act passed easily.

The Act institutionalized a culture of volunteerism in the NPS that continues today. NPS managers regard volunteers as a critical component of their park's ability to provide services. "The most important part of the volunteer program is engagement of the American public in the stewardship of the national parks…. So even if you had, in theory, 100 percent budget covering all core responsibilities of a park, you would still want a vibrant and robust volunteer program" (Superintendent A, pers.comm., telephone interview, 12 January 2011). The Act, responding to a relatively modest need at the time, has expanded into a dynamic force in our parks.

Large supply of willing volunteers

While the NPS volunteer program began slowly, its popularity has exploded in recent decades. The VIP program now receives the contributions of over 220,000 volunteers annually and the number is steadily growing (Figure 2). For reference, the NPS full-time equivalent (FTE) staff is just over 20,000. NPS work resonates with a great variety of volunteerism values. There are a multitude of altruistic and egoistic motivations that drive individuals to donate their time to the national parks.

There are distinct altruistic values that are fulfilled by national park volunteerism. By working in a park, an individual can fulfill their need to contribute to environmental preservation. At the same time, being a federal agency, national parks offer volunteers an opportunity to engage in public service. Finally, many park visitors become attached and devoted to the protection of particular places. Volunteering gives them the power to help preserve the area for future generations.

Egoistic motivations can also play a significant role in the decision to volunteer in the parks. Paid NPS positions are notoriously hard to acquire, and even seasonal opportunities can be highly competitive. Volunteering in a park gives an individual valuable experience and skill development, while granting them exposure to potential hiring managers. Some volunteers may also enjoy privileged access to our country's most beautiful places. Acting as a campground host can give volunteers the rare opportunity to spend extended periods of time in a park. "It has been our dream to live in a national park … and one means of doing that is volunteering" (Volunteer A, pers. comm., telephone interview, 21 January 2011).

Whatever the combination of motivations, many feel compelled to volunteer in the parks. Annual VIP participation growth is roughly equivalent to the entire full-time equivalent workforce in the NPS.

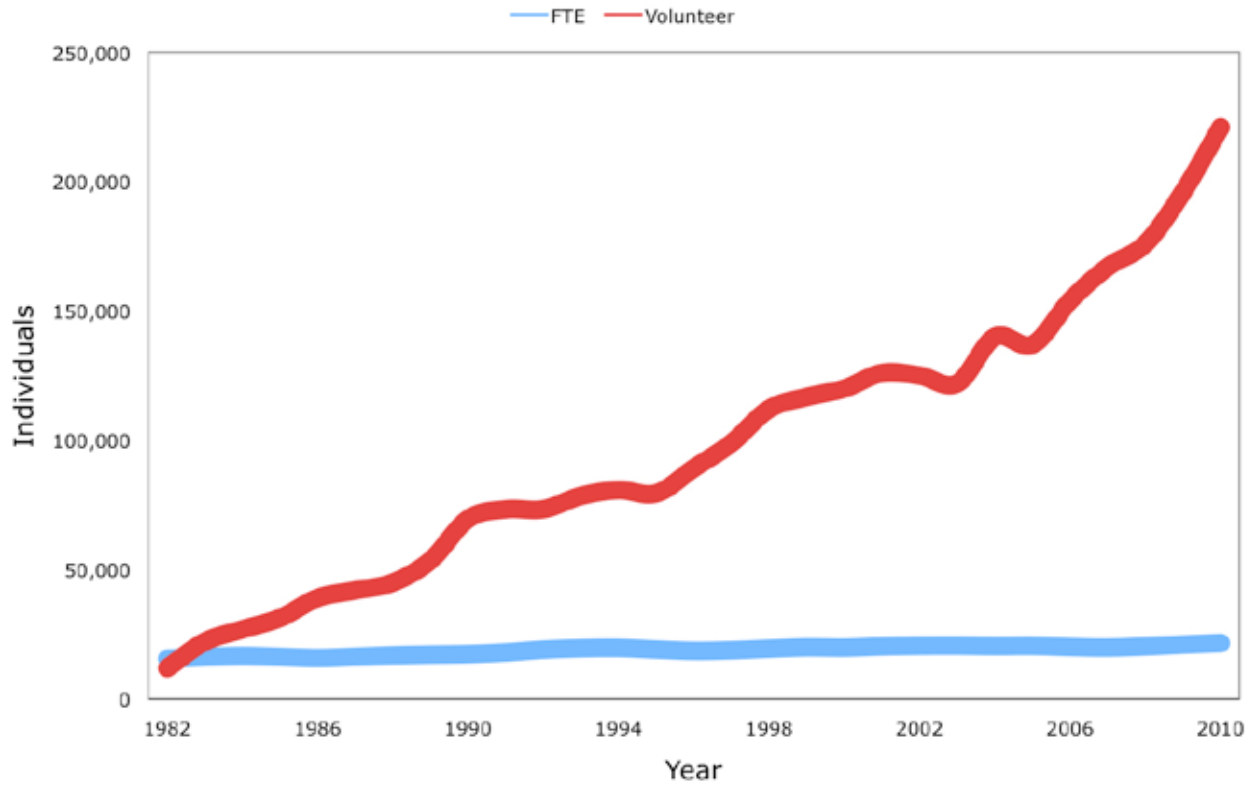


Figure 2. Volunteers and full-time equivalent (FTE) staff, 1982–2010 (NPS 2011).

The role of volunteers expands

Throughout the NPS, volunteers have been deeply integrated into operations. Among many diverse roles, volunteers conduct research for the parks, help guide visitors, and monitor campgrounds. "Volunteers across the service are often times being used in the same way in the exact same location alongside permanent employees. Administratively you can make a distinction … but at face value, most people would say they are pretty much doing the same thing" (Superintendent B, pers. comm., telephone interview, 8 February 2011).

As a result, the distinctions between staff and volunteers can become blurred and ill defined. "The Volunteers-in-Parks (VIP) initiative was intended to augment, not supplant, the services provided by NPS employees. In fact, the NPS policies still make that distinction. It is clear, however, that volunteers now are no longer supplementing the work of uniformed, full-time employees; they are replacing them through programs such as … Volunteers in Parks" (Wade 2005, 65). Wade's observation is perhaps most clearly displayed in NPS interpretive services. In visitor centers, it can almost be expected to see volunteers and paid staff working side-by-side, performing the same or very similar roles.

One NPS volunteer coordinator claims, "I use the same terminology as we do with employees because they apply, we interview, we check references, and we hire them. We just aren't going to give them a paycheck" (Volunteer Coordinator A, pers. comm., telephone interview, 15 February 2011). The contributions of volunteers are not always well advertised; staff and volunteer uniforms and patches are distinct but similar in design. It is reasonable that many casual visitors to the parks would leave without being able to distinguish whether paid or unpaid staff assisted them.

"[Visitors] probably have a vague peripheral awareness of [volunteer contributions] but are not aware of the volume—the simple amount of it.… I would say that the public probably isn't as

aware as some of us might like" (ibid.). Thus, volunteers perform nearly identical roles to many NPS staff, and are likely indistinguishable to the casual visitor. At the very least, visitors are not aware of the magnitude or extent of volunteer contributions.

The resource-responsibility gap

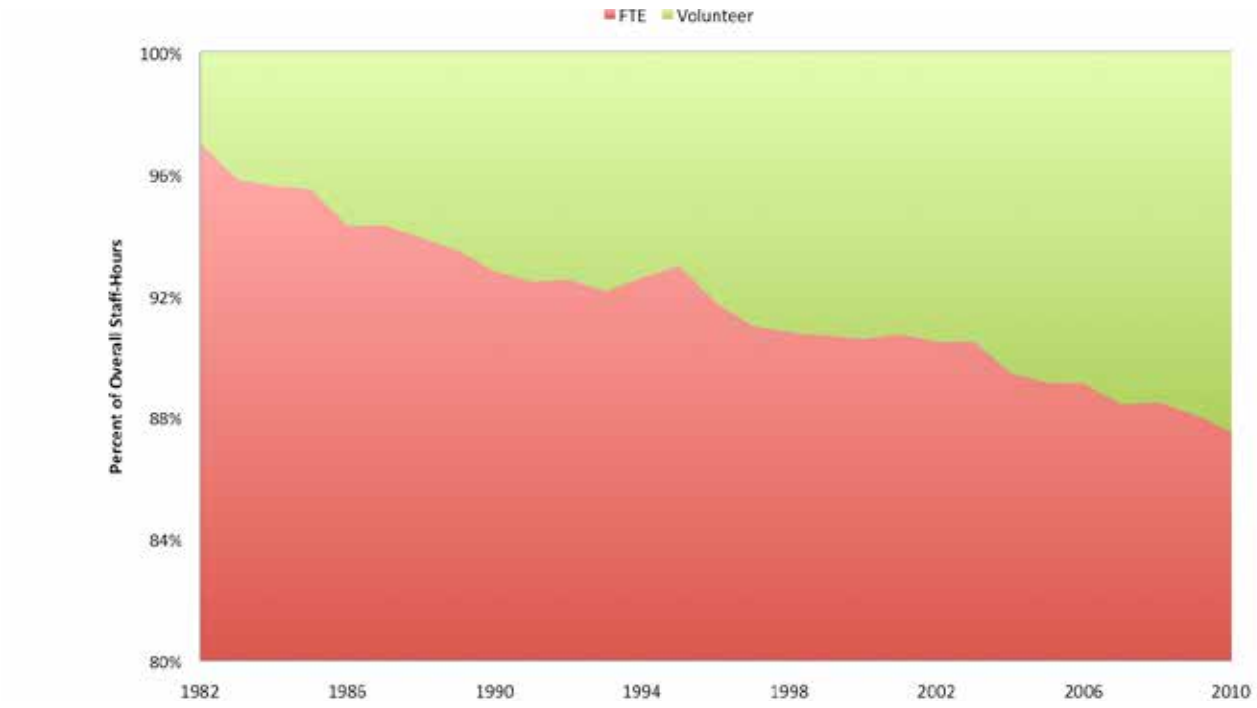
Many familiar with the NPS would agree that the agency operates within a "culture of organizational poverty" (Galvin and Pitcaithley 2008). More visitors, additional acreage, rising fixed costs, and maintenance backlogs are all steady and growing strains on the NPS. New programs and responsibilities, such as research learning centers, show that the expectations of a modern NPS have expanded as well.

Park budgets have grown, but many are skeptical that they have been commensurate with these new demands on the NPS. It is reasonably argued that the NPS is in dire financial straits and facing serious budgetary challenges. Former Chief Historian for the NPS, Dwight Pitcaithley, observed that the average budget shortfall uncovered in the National Park Conservation Association's Business Plan Initiative was 32 percent. Pitcaithley concluded that, "national parks have been operating on only two-thirds the funding required to preserve, research, and interpret to the visiting public" (Pitcaithley 2007).

Sentiment in the parks echoes this figure. "When [the NPS is] the caretaker of all of the history of all the country as well as some really outstanding natural resource real estate, is it funded fully for that mandate? It's not" (Superintendent A, pers. comm.). Parks are frequently expected to do more than what their finances allow.

Logically, the resulting gap is commonly filled by the work of unpaid volunteers. Already working alongside paid staff in many roles, such as interpretation, it is no surprise that volunteers are utilized strategically when resources are strained. According to a Government Accountability Office study, "park officials … reported that they increasingly relied on volunteers and other authorized funding sources to provide operations and services that were previously paid with allocations for daily operations from the ONPS [Operation of the National Park System] account" (GAO 2006, 12).

Figure 3. Share of national park staff-hours, 1982–2010 (NPS 2011).



Over time, this has led to volunteers shouldering an increasing share of work in the national parks. Volunteers currently contribute over 12 percent of the staff hours needed to run the parks (Figure 3). That figure is growing and shows no signs of slowing.

The emerging truth is that current budgets are insufficient to support the programs and services expected from the national parks. This resource-responsibility gap is filled by the work of an eager and growing volunteer force.

Short-circuited democracy

While the national parks are often revered as beacons of American democracy, I posit that the democratic feedback process is somewhat short-circuited in the parks. A 2010 Hart Research Associates Poll found that 98 percent of Americans feel it is important for the federal government to protect the national parks (Hart Research Associates 2010). Why, then, have Americans put little pressure on Congress to rectify these serious budget shortfalls in the NPS? The presence of volunteers may obscure citizens from the true condition of their parks.

"[A public official] cannot fully succeed unless the citizens intelligently cooperate with him by making known their wants.… Citizens, however, cannot exercise that obligation effectively if they are ignorant about their government" (Capes 1922, 14). In order for Americans to make an informed decision about the management of their parks, they must first be given accurate information on national park health. In the NPS, a public-facing agency, this information can be gathered by one's experience visiting a park.

In truth, visitors are exceptionally satisfied with the current condition of the parks. The University of Idaho's Park Studies Unit gauges visitor satisfaction each year with their Visitor Survey Card Project. For the past decade, satisfaction with both park staff and the overall park experience has remained between 96 and 98 percent (University of Idaho; data originated from the University of Idaho Park Studies Unit, Visitor Services Project, and database creation is supported by funding from the NPS Social Science Division, and from individual NPS units). The survey, however, makes no mention of the work of volunteers.

It is remarkable that parks, operating with two-thirds the appropriate funding, leave citizens superbly satisfied. They do so by "hiding the hurt" (ANPR 2004, 4). Well-intentioned park management shields visitors from the realities of a struggling NPS. "The last options chosen are always those that impact visitors. The perception of visitors from their short visit is not the same as the informed view over time of NPS employees and other professionals engaged daily in resource stewardship. The typical park visitor does not see the effects of patrol and resource program cuts … so the degree of true damage often goes unnoticed and undocumented" (ANPR 2004, 4).

It is in the culture of the NPS to create a positive visitor experience at any cost. "We work very hard to not make those cuts obvious to visitors. That's probably not to our own best interest" (Superintendent C, pers. comm., telephone interview, 11 February 2011). This culture leaves visitors ignorant of the challenges the parks are facing.

The use of volunteers to fill in the resource-responsibility gap limits the public's exposure to budget cuts. Visitor satisfaction is undoubtedly impacted by the work of volunteers but, as discussed above, it is unlikely that the casual visitor is aware that 12 percent of the staff hours supporting the parks are not provisioned by citizen taxes.

Because the public is ignorant of the true state of our parks, no notable public outcry is evident when the NPS continues to be asked to do more with less. Congress faces little pressure to close the resource-responsibility gap and, as it widens, the need for additional resources steadily grows. The NPS's seemingly endless volunteer corps is happy to heed the call and the cycle begins again.

Conclusions

The importance of volunteerism in the NPS is undeniable. This research aimed to uncover the dynamics that underlie the rapid and continuing growth of the VIP program. I argue that a complex and self-feeding cycle has propelled volunteers to hold a significant and increasing role in the parks.

The Volunteers in Parks Act laid the groundwork for the institutional integration of volunteers in park services. A great variety of motivations compel individuals to volunteer in the parks, creating a volunteer corps that is more than 10 times that of the full-time equivalent NPS staff. Park management allows volunteers to become ubiquitous and help fill in gaps left by budget shortfalls. This shields the public from the agency's challenges; the resource-responsibility gap widens and the need for volunteers intensifies.

There are many opportunities for additional research on national park volunteerism. Further study would help us understand to what degree visitors are aware of volunteer contributions. Likewise, it is important to determine how volunteerism alters park management. How will parks be affected if the volunteer corps stagnates or begins to decline? Ultimately, if the NPS is to effectively plan for the future, it must critically examine the VIP program and craft deliberate volunteer management policies.

Volunteers have become too important to ignore in the NPS. In the process of helping to save our parks, they are altering the way in which this public service is provisioned. In the end, a thorough discussion of these issues will strengthen the NPS that we, especially the volunteers, love so intensely.

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15

Connecting People to Parks through Outdoor Play

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[Ed. note: The format for this session was a café conversation, with a brief introductory presentation, followed by time for sharing and discussion with participants.]

Connecting people to parks

When the National Park Service (NPS) released "A Call to Action" in 2011, one of the four major themes was "Connecting people to parks." As components of this theme, the NPS identified four goals it must achieve:

1. Develop and nurture lifelong connections between the public and parks through a continuum of engaging recreational, educational, volunteer, and work experiences.
2. Connect urban communities to parks, trails, waterways, and community green spaces
3. Expand use of parks as places for healthy outdoor recreation that contribute to people's physical, mental, and social well-being.
4. Welcome and engage diverse communities through culturally relevant park stories and experiences that are accessible to all.

From this theme and its goals, we draw the idea of connecting people to parks through outdoor play, and want to extend the network of outdoor play opportunities to include all parks, protected areas, and cultural sites.

Actions underway in the NPS that could be used as examples for future play opportunities include "Take a hike and call me in the morning," a specific action in the Call to Action plan, and the "Healthy Parks, Healthy People US" program. Both initiatives target the third goal in the Connecting people to parks theme by engaging the health community, and make prudent use of the numerous health benefits derived from spending time in parks. Furthermore, the Healthy Parks, Healthy People US program seeks to expand this engagement to business innovators, scientists, advocacy organizations, and more. This development of partnerships across sectors is crucial to

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building support networks. These initiatives from our national leaders can serve as innovative templates and ideas for increasing outdoor play in our parks, protected areas, and cultural sites.

Outdoor play

By 2009, former NPS Director Fran Mainella and many others recognized the trend of increasing disconnection from nature, particularly by young people. Mainella had witnessed it in national parks in the form of decreasing attendance, and Richard Louv documented both the disconnection and the tremendous health consequences in his book The Last Child in the Woods: Saving Our Children from Nature Deficit Disorder (2008). Wondering whether a decrease in the value of play might be related to the growing gap in nature experiences, as well as the numerous health crises, Fran Mainella, Brett Wright, PhD, Chair of the Parks, Recreation, and Tourism Management Department at Clemson University, and many others collaborated to organize the Summit on the Value of Play in June 2009.

The summit was held at Clemson University and convened leaders from diverse fields, including landscape architecture, business, education, medicine, health science, and parks and recreation. Through keynote speakers, poster presentations, and numerous breakout sessions, it became clear to participants that play and the value of play had disappeared from the fabric of everyday life for people of all ages. What had once been said, "Go out and play and come back in time for dinner," was replaced by stranger danger, screen time, and hyper-structured activities. Summit participants urged the creation of the US Play Coalition as a partnership to promote the value of play throughout life. Furthermore, participants encouraged summit leaders to establish an annual conference and to create a website to facilitate linkages among the play community, to develop training materials, and to generally meet the needs of the growing play community.

Since 2009, this effort has blossomed, and the US Play Coalition hosts an annual conference on the value of play, which has received numerous international visitors, reaches a network of nearly 1,900 with a monthly newsletter, communicates daily through social media networks, offers two certificate of completion programs (playground maintenance and play facilitation) in cooperation with Clemson University, has a dynamic website (http://usplaycoalition.clemson.edu), organizes play ambassadors and more, all with a focus on the value of play as a vital component of a healthy and happy life. Play in parks is a natural solution that meets both the mission of connecting people to parks, and the goal of addressing the play deficit and the resulting physical, mental, and emotional health crises. Play in parks is likewise important to developing the next generation of natural and cultural resource stewards, by giving them opportunities to connect with park resources and build meaningful relationships with our special places. Thus, as current and burgeoning leaders, we must consider the role we can fulfill in making our parks, protected areas, and cultural sites more playful for people of all ages.

Discussion

During the sharing and discussion portion of the café conversation, we were able to learn about new perspectives on play, and what was taking place around the country and world to create play opportunities in parks. Both successes and challenges were presented, and facilitated a robust dialogue and exchange. A selection of the topics and ideas shared is presented below.

In addition to the US Play Coalition, we acknowledged organizations, such as the National Park Trust, Let's Move, the National Wildlife Federation, the U.S. Forest Service, and more who are likewise using play to help move people toward living healthier and happier lives. For instance,

one participant talked about Kids in the Woods, and Children's Forests, two Forest Service initiatives to encourage play and exploration in our national forests. This shared mission to create play opportunities in our parks is a tremendous asset, because it will encourage collaboration and sharing of best practices among our groups.

A researcher commented on his study of resource protection and vegetation damage by children at a play site, providing the unexpected insight that small groups of children cause more damage than large groups. This raised an important challenge of balancing use and protection in our special places: how do we accommodate both? Can we create spaces resilient to repetitive play? Should we cycle use of particular areas with seasons, allowing time for recovery between play periods? Are certain places so sensitive that any play is too much? What are the consequences of restricting all play in an area?

A city planner for an ethnically diverse community commented on the need to consider language and phrasing when introducing activities, citing that "take a hike" could be misinterpreted. This comment emphasized the need to be inclusive of community members from all backgrounds when planning play opportunities. For instance, certain games may be common to one group but unfamiliar to another; how can we facilitate an exchange of play ideas and activities? This also ties back to the theme of connecting people to parks and providing culturally relevant opportunities and experiences that are open to all.

Accommodating technology in both practice and attitude was also cited as an important consideration. One participant made the point that children are maturing and developing skills in a wired world, and denying them the opportunity to engage with technology may be detrimental to long term success. Furthermore, eliminating or condemning use of all technology is likely to have a negative effect on attendance and participation, regardless of age. As an alternative to restricting technology, leaders may seek ways to integrate technology to enhance the outdoor play experience. Developing applications that facilitate exploration and reward users with badges and tokens may encourage participants to engage with the resources longer or in greater depth. Placing links to audio and video files on the web and on posted signs can facilitate self-paced learning. Technology cannot replace our parks, protected areas, and cultural sites, but it can act as a gateway to them. Thus leaders must strive for a balance between technology use, play, and nature experiences. Moving forward, we can work and play together to share best technology practices in our hyper-connected world.

Based on these comments and more, we recognize both the immense potential for, and barriers to, play in our parks as a pathway toward better physical, mental, and emotional health. Creating a dialogue about play is the first step, and we gratefully acknowledge all café conversationalists for their participation. We hope you too will join the conversation, but first we encourage you, as mom might have said, "to go out and play and come back in time for dinner!"

For more information on the US Play Coalition, visit us on the web at http://usplaycoalition.clemson.edu/.

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Mendocino Woodlands: Leveraging Resources Effectively to Complete Cultural Landscape Projects for Historic Sites

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Mendocino Woodlands State Park is one of many historic properties caught between the proverbial rock and a hard place, a situation further exacerbated by lean economic times and reduced preservation funding. Blessed with incredible integrity, this national historic landmark is hovering on the brink of losing distinct cultural features, if rehabilitation and restoration work cannot move forward. Neither Mendocino Woodlands Camp Association (MWCA), which manages a decades old historic camp (Figures 1 and 2), or California State Parks, which owns the property, wanted that to happen, and realized that a cultural landscape report (CLR) was necessary to provide guidance necessary for future preservation treatments. They recognized a CLR was critical for looking holistically at preserving the historic character of this New Deal-era, former recreation demonstration area, which is one of only two remaining in the United States with such high integrity, and one of only two built on the west coast.

Mendocino Woodlands, located deep in a redwood forest in northern California, is incredibly remote, large, and complex, making a traditional approach to developing a CLR cost prohibitive. Added to that, California State Parks could provide only nominal financial assistance. Though MWCA worked hard to raise funds, it was still not enough to support a traditional approach. An innovative solution was needed to close the funding gap and address the site's challenges. In this case, the approach hinged on effective partnerships (one between a university and a consulting firm, and another between MWCA and California State Parks), consensus-building, and effective leveraging of project dollars.

MIG, a consulting firm, partnered with the University of Oregon (UO) to develop a CLR which provided more than $120,000 worth of services for $60,000. The resources of each partner were leveraged efficiently, so that tasks which were best suited for the university were accomplished by UO, and those best suited for a consulting firm were led by MIG. This necessitated the project being divided into two phases, with MIG providing guidance and support for a UO-led

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Figure 1. Mendocino Woodlands Camp Two Dining Hall, October 2011. Photo by Laurie Matthews.

Figure 2. Mendocino Woodlands Camp Two Bridge and Infirmary, October 2011. Photo by Laurie Matthews.

Figure 3. University of Oregon Inventory Team (left to right) Alexandria Donati, Justin Demeter, Jamie Whitney, Pete Rutowski, and Vivian Schoung, March 2010. Photo by Robert Z. Melnick.

landscape architecture design studio during phase one, and MIG taking the lead during phase two for building consensus between the partnering agencies, and developing the final report.

This partnership allowed the UO to introduce cultural landscape planning and design to its students, provide financial support for travel and lodging for the students, and facilitate a relationship between students and a professional office (Figure 3). Key to the success of this project was the passion brought to it by the Mendocino Woodlands Camp Association, and their ability to supplement actual dollars with in-kind donations of lodging, food, and research support for the team. This greatly reduced the funding gap, and was critical to moving the project from theory to reality. In addition, this partnership helped educate MWCA staff about cultural landscapes and historic preservation, and helped build consensus on tough issues for MWCA, California State Parks, and other partnering agencies.

Several lessons were learned during the completion of this project. Consensus-building not only helps achieve immediate project-related goals, but also can bring solutions to decades-long issues that only a village could solve. A large, mobile group is needed to inventory large, complex cultural landscapes efficiently, and setting up a system for how that documentation happens is critical for it to be accessible by everyone at every stage of the project. Preparation and flexibility is key, especially during intensive project phases like research and site inventory, to ensure that everyone's time is being used most effectively, and that the team is able to adapt to changing conditions and opportunities.

This project ultimately benefitted Mendocino Woodlands by developing a CLR that would have otherwise gone undone, but the project approach itself planted many other beneficial seeds for those involved. In essence, it's the process, that involved a team of people, which expanded the reach of this place, its history, and the incredible legacy that it will continue to share through continued, effective stewardship.

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Dissecting Credibility: Components of Credibility for Science/Resource Management Professionals

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Background/purpose

The National Park Service (NPS) is developing the Career Field Academy, a learning and development program for employees in all career fields. Seven career field tracks are being developed, including one for natural resource professionals. Development of the Career Field Academy's curriculum for natural resource professionals began in earnest in 2010, building on several previous efforts that included the assessment and identification of important career field competencies (NPS 1996).

One of the important competencies identified by NPS for natural resource professionals was "professional credibility," defined as "not only scientific knowledge and abilities, but also contributions to science and scientific endeavors which are recognized by peers in government agencies and the academic community as providing a solid foundation and leadership in the level and type of natural resource work performed." The following associated sub-competencies were identified:

- Ability to develop an active network of professional interaction with peers in the scientific community;
- Ability to publish articles in peer-reviewed publications and/or make presentations at scientific meetings;
- Ability to maintain a level of scientific knowledge and skill in application that are recognized by peers in government agencies and the academic community as credible and providing a basic foundation for work provided;

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- Ability to carry out peer review of scientific reports, and to participate in developmental assignments as a member of teams reviewing natural resource programs;
- Ability to establish and maintain networks in fields outside own discipline as directed or with guidance; and
- Ability to participate in professional meetings in field of expertise.

Teaching "credibility" to build competencies requires study, planning, and curriculum development. The authors were part of a natural resources work group coordinated by the natural resource career field training manager, National Park Service, Washington Office of Learning and Development.

Credibility of scientists/science professionals

Scientific credibility has been the subject of numerous papers. In the politics of science, truth and credibility are not one and the same (Shapin 1995). Credibility is the product of complex and contingent social and cultural processes. There can be no one recipe for how to produce credibility. The means by which credibility is developed, maintained, distributed, contested, and lost are often believed to be too complex and contingent to generalize. However, there are elements of credibility to consider regardless of circumstance.

Some see a more simplistic interpretation in which their knowledge is enough to establish their credibility. However, no claim of knowledge has inherent credibility (Alagona 2008). All claims of knowledge must win their credibility through social and cultural processes, and conditions under which all claims of knowledge achieve credibility may differ depending on subject matter. As Shapin notes, knowledge alone is not power. Statements of fact mean different things to different people. The truth does not "shine by its own light."

Scientists often make the mistake of believing that credibility and objectivity are directly linked—that credibility derives from the transcendent power of unbiased science, and that the appearance of advocacy can only damage their professional reputations (Gill 2001). And while that objectivity contributes to credibility, the literature offers no evidence for a clear universal relationship between credibility and objectivity. Alagona observes that scientists with the most public credibility are not those who have cultivated a reputation of objectivity among their peers. Rather, they are the ones who have devoted their time to public service and participation in collaborative planning efforts, articulated their biases and opinions, worked to find common ground among their fellow citizens, and respected the ideas of non-experts who have every right to participate in a democratic decision-making process (Rigg 2001).

The role of scientists and science professionals is often described using several models. The traditional view holds that where science is relevant to policy processes, the role of the scientist is to facilitate management decisions by providing objective scientific information to managers and policy-makers, who in turn have the primary responsibility to debate management options, interpret scientific information, and make decisions (Lach et al. 2003). In this model, scientists lose their credibility if they cross the line between science and policy or management. In natural resource management, however, the emerging model has scientists engaged in public decisions, actively involved, interpreting the scientific data and findings, and thus, finding themselves in a special position to advocate for specific management policies and alternatives. Wagner (1999) indicates that ecologists should avoid advocacy of public policy options; scientists can help lay out the value implications and consequences of policy alternatives, but they should keep their environmental value judgments to themselves.

The traditional tools used by scientists for judging credibility in the scientific arena—conceptual models, quality of journals, and even data generated—are not strong factors for manag-

ers, interest groups, or members of the public in determining a scientist's credibility (Lach et al. 2003). For these groups, a scientist's credibility appears to be based on his or her disciplinary reputation, on the practical nature of the research conducted, and on the experience and knowledge of place-specific sites. His or her credibility is contingent upon their ability to deliver research results that managers and others can use, and to communicate with other groups. The scientific culture values publication and peer review; managers and the public value communication of research results, on-site trips, and demonstrations (Lach et al. 2003).

Being credible to all camps—other scientists, managers, the public, and others—requires different, complementary emphases that are integrated and balanced.

Teaching credibility

How would we help employees understand credibility? How can we help them understand the elements of credibility, and the investments they need to make in these elements, and how to build credibility with different audiences?

Prior to curriculum development, the work group assessed how the competency—credibility—would manifest in "tasks," and what those tasks would look like when performed well. What does "credibility" look like? How do we build credibility in individuals, teams, collaborations, and organizations?

The authors assessed, analyzed, and discussed these tasks and "pictures" of credibility, and drew conclusions included in the Credibility Model (below). They also consolidated current guidance on scientific integrity, including the code of conduct.

Building credibility

Professional credibility is larger than scientific credibility, but certainly scientific credibility is core to performance in the natural resources job series.

For NPS natural resource professionals, their credibility will ultimately define them professionally. It will either give them great opportunities or limit their options. The National Park Service and other agencies need their natural resource professionals to be credible, because opportunities and options extend to these organizations as well.

Each of the authors knows science professionals who were not at the top of the professional credibility scale. Yes, some of these were because of less-than-stellar science, but most were because of missed opportunities, lack of effort, or unawareness of the need to demonstrate certain things related to credibility. Some may not put in the effort to remain current in their science. Others may think anything other than their science is unimportant. As Alagona (2008) noted, some think knowledge should be enough to be seen as credible.

Things happen in the course of a career. Some things are planned, some are not. Some people are deliberate about their science and scholarship, and may or may not be deliberate on other matters that reflect upon their professional credibility, such as interactions with managers and the public. Building proficiency at something, and eventually becoming recognized as credible, can be happenstance or it can be planned out as part of a career, and diligently built, maintained, and protected.

Science professionals need to be active in their scientific community. That means being current, networking, publishing, getting and participating in peer review, and knowing and abiding by the code of conduct. But there is more to professional credibility than these considerations. The Credibility Model (Figure 1) and accompanying table (Table 1) illustrate and discuss the various components/elements of credibility for natural resource professionals.

Most new natural resource professionals in the NPS (and other agencies) have an intuitive understanding of what may be required to build some level of credibility. However, knowing the

Figure 1. A "word cloud" illustrating some of the key words and ideas that emerged during the discussions at this international conference.

elements of credibility and being more deliberate in building that credibility will aid them not only early in their career, but also as they plan for the next phase of their career, when their jobs will become more complex with more responsibilities. A few points for consideration:

- Natural resource stewards may have a better chance of achieving credibility if they begin building a clear picture of how to remain current in their discipline, and also advance their science and scholarship as leaders and participants in a wide variety of professional activities, including how to collaborate in professional organizations and societies (Gary Davis, pers. comm.). Natural resource professionals will benefit from knowledge of how to be fully functioning members of professional communities, ranging from local associations, through regional and national societies, to international and honorary or elected academies (such as

Professional Credibility

Components/	Attributes	Related Characteristics
~	Adept at scientific method and follows scientific standards	Showing scientific and scholarly integrity including code of conduct
	Publications	Maintaining professional skills through publications
	Peer Review	Participating in peer review process
	Scientific networking, leadership, and collaboration	Using networking and collaboration to amplify and extend personal and program capabilities
Expertise	Credentials	Knowledge/expertise, arising from your college education and independent studies
	Certifications	Being recognized through a formal procedure by an accredited or authorized person or agency, as having the attributes, characteristics, understanding, experience, qualifications and/or status to meet requirements or standards needed to conduct or carry out an activity
	Competence	Able to effectively, efficiently and/or successfully put those credentials and certifications to work, and be relied upon to do so.
Integrity	Consistency	Consistency of actions, values, behavior, measures, principles, expectations, outcomes. That consistency strengthens your reputation; inconsistency erodes it. Whom do you respect for their integrity? Why? Watch them under difficult circumstances and see what you can learn from them.
Trustworthiness	Trust	Your words are truthful. People believe what you have to say because it is coming from you.

Table 1. Components of professional credibility.

American Association for the Advancement of Science and National Academy of Sciences). Service to these societies is likely most effective if woven into career plans, not only to remain current, but to help them remain aware of credentials and collaborations needed to get there. If early in a career individuals have awareness that at some point in their career, they may be called upon to contribute as leaders in these professional communities (through planning and service), they will be prepared to do so.

- Natural resource professionals will benefit significantly if they have the knowledge, skills, and abilities to interact and communicate effectively with a variety of audiences, including managers, co-workers, and the public. Credibility is likely to grow if they interpret the results of their own work and explain science, scientific findings, applicability to management, and relevance to a site or place, and do so in a way that preserves their reputation for objectivity and adherence to appropriate scientific conduct. They also will benefit through a willingness to build and maintain a reputation for integrity and trustworthiness with these audiences.

- Natural resource professionals can best grow their careers if there is transparency and understanding of the career ladders arching to the highest levels in federal service, such as senior technical positions equivalent to senior executive service positions. There are myriad career opportunities for scientists and scholars, and those new to their careers need to know the opportunities, risks, and pathways. Opportunities to shoulder levels of responsibility, complexity, internal and external politics, and public visibility at future stages of a career can arise or disappear due simply to credibility.
- The process of building credibility requires analysis and reflection upon many things. The Career Field Academy for natural resources will emphasize including this analysis and reflection in career planning.

Conclusions

The concepts of credibility are multifaceted, but can be distilled down to some fundamental elements, for learning and practice. If science professionals are deliberately aware of, plan for, and intentionally build around these components of credibility, they are likely to significantly increase their effectiveness in early career phases, and build a foundation for credibility in subsequent, more complex assignments. The ability to apply the components described above in combination with career ladder opportunities will aid in the development of professionals and their successes in being fully-functioning members of professional communities at local, regional, national, and even international levels. A willingness to serve, and prepare themselves to lead when called upon, will be career-defining characteristics. The NPS Career Field Academy for natural resources will emphasize components of the model (presented) in its training and development curriculum.

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Exploring Opportunities for Enhancing Relevancy and Sustainability through Cultural Landscape Conservation

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"Cultural landscape" is still a relatively new concept for conservation, yet it derives from a very old idea, one that has been adapted into new use in conservation. Cultural landscapes were referenced at many of the George Wright Society (GWS) conference sessions and it was noted that cultural landscape conservation, like many other areas, has continued to evolve in response to new challenges and opportunities. This panel discussion took advantage of a recent international conference as a catalyst for this dialogue to reflect on the state-of-the-art in cultural landscape conservation.

Last fall, at Rutgers University, over 330 people from 30 counties on 6 continents participated in an international conference, "Cultural Landscapes: Preservation Challenges in the 21st Century," convened by the Cultural Heritage and Preservation Studies at Rutgers University and co-sponsored by the U.S. National Park Service (USNPS) and many other organizations (see conference sessions online). A diverse collection of people participated, including indigenous community leaders, other practitioners from government agencies and nongovernment organizations, as well as academics. The conference was organized as part of the fortieth anniversary of the World Heritage Convention, one of many events around the world designed to reflect on the implementation of this international treaty. The conference also marked the twentieth anniversary of recognition of cultural landscapes as eligible for the World Heritage List. With those landmarks in mind, conference participants reflected upon recent experience with cultural landscapes that has

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prompted rethinking of conservation practice in areas such as integration of natural and cultural heritage, collaboration across large landscapes and across sectors, the role of local community leadership, enhancing relevancy, and linkages with sustainability (Figure 1).

These discussions, drawing on international experience with cultural landscape conservation, were inspiring, and convinced us that it is timely to renew our dialogue here in North America. Consequently, one of the goals of this panel discussion on cultural landscape conservation, convened at the George Wright Society conference, was to gain additional perspectives on this dynamic and growing field, and reflect on some of the new ideas and directions that are emerging, in particular, strategies to enhance the relevancy and sustainability of current conservation efforts. This paper draws both on the findings of the international conference last fall and the panel discussion at the George Wright Society conference.

Reflections on accomplishments and current practice

Over the last thirty years, there has been substantial progress and many accomplishments in cultural landscape conservation. The USNPS first officially recognized cultural landscapes when the agency founded the Park Cultural Landscapes Program, and began developing preservation standards for landscapes in the 1980s. The USNPS took a broad approach to defining cultural landscapes—from designed to vernacular and ethnographic landscapes (USNPS n.d.). In 1992, the World Heritage Committee specifically acknowledged cultural landscapes as eligible for the World Heritage List, and recognized a similarly broad range of landscapes (Rössler 2006; Mitchell, Rössler, and Trichaud 2009; UNESCO n.d.).

Examples of cultural landscape conservation across North America and around the world demonstrate how adaptable the cultural landscape concept has been. Over the last 20 years, the cultural landscape concept has proven useful in a wide variety of settings, scales, and contexts (Brown, Mitchell, and Beresford 2005; Mitchell, Rössler, and Trichaud 2009; Taylor and Lennon 2012; Barrett n.d.). This experience has developed a shared recognition for a diversity of

Figure 1. A "word cloud" illustrating some of the key words and ideas that emerged during the discussions at this international conference.

values resulting from the interaction of culture and nature that are represented through tangible and intangible heritage. The flexibility of this concept and its associated methods, and their continued evolution, have been inherent strengths, creating openness to ancient and new ideas and interpretations. Importantly, a growing voice from indigenous and other local communities gives eloquent expression to deeply held values and resilient landscape traditions, as well as insights into a variety of relationships between culture and nature. As cultural geographer Peirce Lewis has noted, "Our human landscape is our unwitting autobiography, reflecting our tastes, our values, our aspirations, and even our fears, in tangible, visible form" (Lewis 1979, 12).

Today, it is widely recognized that cultural landscapes are the result of a long and complex relationship between people and nature. These landscapes are with us today because of the past and present-day stewardship of communities living in and near them (Brown, Mitchell, and Beresford 2005). They are places of ingenuity and innovation, of mystery and spiritual power, of learning and healing, of conflict and co-existence, whose complex array of cultural and natural values represented by tangible and intangible heritage are not readily understood by the outside visitor or manager. Understanding requires honoring the world-views and core values of the communities that are (or were) their stewards over different periods, listening to diverse voices and perspectives, and respecting the different knowledge systems and practices embedded in these places, which have much to teach us about resilience.

Over the last two decades, there has been substantial progress in integrating cultural landscapes into international, national, and local instruments, laws and policies and this has provided recognition of and encouragement for using the cultural landscape concept. The inclusion of cultural landscapes under the UNESCO World Heritage Convention in 1992, and the concept in other instruments, such as the European Landscape Convention in 2000, has created a set of broad policy frameworks for conservation that continues to evolve (Rössler 2006; UNESCO World Heritage Centre n.d.; Council of Europe 2000). This formal recognition has also encouraged development of scholarship, theory, and examination of practice (Kothari, Camill, and Brown 2013; Plieninger and Bieling 2012; Taylor and Lennon 2012).

Recognition of cultural landscapes has also influenced the theory and practice of historic preservation and its relationship to nature conservation. Cultural landscape conservation has shaped a concept of heritage that has become increasingly dynamic and inclusive. Importantly, conservation of many cultural landscapes is reliant on local and indigenous leadership and governance, and traditional knowledge systems and institutions, and is integrated with other policies and programs. Within the World Heritage context, for example, the cultural landscape concept has become increasingly robust, and has created opportunities for World Heritage nominations from many countries that recognize a variety of living landscapes, many with associative values. This experience has contributed feedback to improve the implementation of the World Heritage Convention, and forged connections with other conventions (e.g., Convention on Biological Diversity) and organizations (e.g., Food and Agricultural Organization of the United Nations).

Certainly, the interdisciplinary nature and flexibility of the concept have made it a useful framework for many situations and contexts. In particular, cultural landscapes have become an important arena for integrating perspectives and strategies for cultural and natural heritage conservation, as well as for integration of conservation and sustainable economic and community development.

At the GWS conference discussion, two panelists added their international perspectives to the dialogue on cultural landscapes. Tim Badman, of the International Union for the Conservation of Nature (IUCN) World Heritage Programme, discussed the IUCN's role and recent initiatives in advising the World Heritage Committee on cultural landscape nominations to the World Heritage List and their management in cooperation with International Council on Monuments

and Sites (ICOMOS; see IUCN World Heritage Programme n.d.). Terence Hay-Edie offered examples of engaging local communities in stewardship of globally significant protected areas, such as World Heritage Sites. This innovative program, Community Management of Protected Areas Conservation (COMPACT), an initiative of the U.N. Development Programme and Global Environmental Facility (GEF) Small Grants Programme and other partners, empowers communities to reconcile conservation with sustainable livelihoods, including the use of biodiversity at the local level (Brown and Hay-Edie 2013).

Looking ahead

Even with the substantial progress described by session speakers, cultural landscapes around the world face serious challenges posed by globalization, demographic shifts, and climate change. There is a sense of urgency, given these serious challenges and the vulnerability of many important cultural landscapes, and an acknowledgement that addressing these challenges will require broad commitment and action. Given the diversity of challenges, development of successful strategies can benefit from collective experience and research, sharing knowledge across communities and disciplines, and developing innovative responses.

Based on these recent discussions, several ideas for next steps were identified. In the USA, for example, the USNPS is undertaking several new initiatives leading up to the agency's centennial, and the fiftieth anniversary of the National Historic Preservation Act, in 2016. Some of the actions are underway, while others are planned for the intervening years:

- **Recognize cultural landscapes as a distinct property type within the National Register criteria.** This addresses the challenge of shoehorning these landscapes into site and district definitions. This can begin with revising the data collected on National Register forms to recognize landscape components as contributing features and updating the guidance for documenting and preserving cultural landscapes.
- **Commit to updating the guidance for identifying and managing cultural landscapes**. The USNPS has committed to updating the secretary of the interior's Guidelines for the Treatment of Cultural Landscapes, to address the concepts of adaptation for greater sustainability and resilience to climate change. In addition, the National Register staff are carrying out a multi-year consultation on how traditional cultural properties are being identified as eligible for the National Register, with the intention of updating Bulletin 38. The panel discussed another related effort on indigenous cultural landscapes as a subset of ethnographic landscapes and the importance of understanding how indigenous people perceived and used their environment, and how this legacy continues today.
- **Through legislation, recognize National Heritage Areas as a system of cultural landscapes encompassing communities and their resources, connected by theme and geography, and supported as part of the strategic mission of the USNPS**. National Heritage Areas are an example of large-scale landscapes that are treasured and valued by many people both within the region and beyond. Through a variety of partnerships, and by learning more about successful strategies for governance, the effectiveness of on-the-ground conservation for cultural and natural values can be strengthened. There is much to be learned from experience with this model of community-led preservation of nationally significant stories.

Following the discussions at the international conference, several other suggestions for ways to move forward were offered:

- **Support indigenous and local communities in stewardship of these landscapes** into the twenty-first century through new partnerships that take into account the need to sustain the

core values underlying stewardship—such as tradition, language, respect and love—ensuring that these are reflected in education of the next generation and translated into the policies affecting communities. Such an approach would (1) reinforce the central role of communities not only in management but also in *governance* (by communities or in collaborative relationships), and manage adaptively; (2) honor the importance of distinctive spiritual relationships to the land (enshrined as a human right by the United Nations (UN 2007)); (3) recognize traditional knowledge systems alongside western systems of science, ensuring that these knowledge systems inform management policies, and support communities in transmitting this knowledge and associated practices; and (4) support and develop livelihood opportunities, so that young people have the option of living in their home communities.

- **Further develop the concept and language for "a cultural landscape framework" to more clearly articulate a shared terminology.** While the widespread use of the concept and terms associated with cultural landscapes has contributed to conservation in many countries, there is an increasing concern with the lack of clarity in the terminology. Questions are now being posed, for example, whether the term "cultural landscape" refers to a place, a typology, an approach, or a framework, or all of these ideas, depending on the circumstances. Further clarifying the terminology for this rapidly developing field will encourage better communication and knowledge exchange among a diverse set of practitioners as well as with the public.
- **Develop additional guidance on good practice to improve integration of nature and culture, to sustain traditional processes on living landscapes, to strengthen governance approaches, and to demonstrate forms of sustainable development.** Guidance is also needed on more effective vertical integration from local communities to the World Heritage Convention and with the systems and programs at the national level and on improved crosscutting connections across conventions. To develop and share this guidance, explore the use of communities of practice for peer-to-peer exchange through various social media.
- **Increase capacity building and support research while engaging the next generation by strengthening a network of universities and other organizations including ICOMOS and IUCN**. Develop a research agenda and case studies of good practice focusing on topics such as role of cultural landscapes in sustainable development, legal frameworks, economic impact of heritage conservation, landscape-scale conservation, ecosystem and cultural services, and resilience to disasters and climate change. Disseminate research findings and technical advice using innovative technology.
- **Strengthen education and public awareness** to enhance understanding and safeguarding of cultural landscapes at local, national, and international levels and support initiatives at all levels.

Concluding remarks

The panel at the GWS conference provided an opportunity to share various perspectives and trends in cultural landscape practice and demonstrated the growing interest in the field in both the cultural and natural resource management fields and by indigenous communities. In the discussion, the participants welcomed the renewed interest of the USNPS in further defining cultural landscapes within the existing framework and in learning and sharing best management practices. Many shared their personal experience of connections to cultural landscapes with deep meaning for them and their communities. Discussion emphasized the challenges in conserving what is designated as a cultural landscape and the critical importance of engaging indigenous and local communities, residents and interest groups within the region. The discussion reinforced the findings of the international conference last fall at Rutgers University that landscapes are shaped and sustained by the stewardship of associated local and indigenous communities and that those

knowledge systems, institutions, and perspectives inform future adaptation, sustainability, and resilience. This understanding of landscapes can serve as a guide for successful cultural landscape conservation.

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Telling Stories of Nature and Humans in Midwest National Park Units

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The relationship between humans and nature has long challenged thinkers on environmental issues. The National Park Service (NPS) has traditionally approached the relationship in dualist terms: wilderness excludes people, and civilization excludes nature. Wilderness theorists have profoundly challenged such dualism over the last thirty years (e.g., Nash 2001; Callicott and Nelson 1998). The literature has clarified that one might conceive of humans as part of natural systems, view humans and their domesticated species as separate from nature, or see the humans of civilization as separate from both nature and from their pre-industrial predecessors.

Some newer interpretive programs at smaller park units have begun to interpret such complications. Preserving the tallgrass prairie, and not Daniel Freeman's homestead, has shaped the stories at Homestead National Monument of America, in Nebraska. The ranching communities around Tallgrass Prairie National Preserve (TPNP), in Kansas, have forced a model on the park that struggles over whether it preserves a natural landscape or a cultural landscape. Partnerships with affiliated tribes have helped the process of changing interpretation at Effigy Mounds National Monument in Iowa. While these programs are not perfect, they point the way toward more realistic accounts of human relationships with nature over time, and human relationships with one another. Following their example can contribute to a healthier public conversation about the role of nature in the Anthropocene, even if it challenges some cherished beliefs about the crown jewel parks.

Humans, nature, and wilderness

The NPS constructs the large scenic parks as examples of "wildernesses" that are "untrammeled by man," and without human use (Spence 1999). Yellowstone National Park (in Idaho, Montana, and Wyoming) continues to interpret itself this way, mostly without indigenous people in the past or without tourists in the present (Pahre 2011). Point Reyes National Seashore (California) and Isle Royale National Park (Michigan) have erased evidence of their human histories to recreate a

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"wilderness" (Wockner 1997; Watt 2002). Guadalupe Mountains National Park, established for its wilderness values, interprets Mescalero Apaches, Anglo ranchers, and modern backpackers as both present and absent from wilderness (Pahre 2012).

NPS visions of wilderness reflect how most Americans viewed wilderness in the agency's formative years. It imagines wilderness as a place that people visit, not as a place where people live. It downplayed the Native Americans who used to live in each park, and who were removed as part of park establishment. It ignores its own role as an architect of wilderness (Wockner 1997; Watt 200).

The wilderness lobby has reinforced NPS dualism. As opposition to auto tourism emerged in the 1920s, The Wilderness Society and other groups pressed for roadless wildernesses, reaching their greatest success in the Wilderness Act of 1964. Those views have polarizing political consequences. Many communities near the national parks have resisted wilderness designations or even the use of the word "wilderness." Rural communities believe that wilderness designations "lock up" land and its resources that they might someday want to use for economic purposes other than backcountry recreation.

These views do not accurately reflect current mandates and policy. Grazing is explicitly allowed in wilderness, for example, as is non-motorized recreation. Conflict ensues because dualist images of wilderness do not let us see wilderness as part of a cultural and natural landscape that include certain human presence (Watt 2002). Dualist mental images exacerbate political conflict.

Three park units that lack wilderness designations can help us see other ways to conceptualize human relationships with nature in preserved landscapes. These smaller park units exist on a wider landscape, and their natural resources interact with humans and natural systems outside park boundaries in ways that require interpretation beyond dualism.

Homestead National Monument of America

Homestead National Monument of America commemorates the first homestead established under the Homestead Act of 1862. Remarkably, when the NPS arrived in 1936 it decided to preserve the tallgrass prairie as it appeared *before* homesteading. Prairie restoration began in 1939, the first such program in the national park system and the second-oldest in the USA. Homestead was the first national park unit to use management fire to mimic wildland fire.

Homestead portrays settlers as struggling against both the land and the Native Americans who lived on it. The visitor center acknowledges that, "To settlers, the West was a vast, unused land. To American Indians, it was home." As the settlers triumphed, "Prairie grass gave way to wheat fields. Prosperous homesteaders replaced sod houses with wood frame homes." If nature triumphed, as in the 1930s Dust Bowl, "Dreams Turned to Dust."

Those themes dominate the 25-minute film in the visitor center (NPS 2009c). By using many off-camera voices instead of a single narrator, the film contrasts statements such as "The French sold the land to the United States government" and "We never put our land up for sale"; or, "Their dreams were to see a community spring from the ground up" and "We've been on this land from time immemorial." Those many voices also provide a wide range of perspectives that no single, authoritative narrator could provide.

Yet the film also draws lines—Native Americans have a relationship with the land, while settlers transform it into something else. While the film shows members of various tribes, a voice says, "Our relationship with the earth was a very sacred relationship." Then the film presents settlers and their descendants speaking of America as the story of "land transformation," dreaming "to see a community spring from the ground up."

While recognizing the complexity of the relationships among different groups of people, Homestead tends to draw a stark contrast between Native Americans living in harmony with na-

ture, and the settlers who transform the prairie in opposition to both nature and Native Americans. Though the park is honest about the costs of settlement for Native Americans, it sees settlers and Native Americans only in opposition. As Mark David Spence (1999) has argued, this dualism tends to support a strategy of dispossessing Native Americans along with transforming nature.

Humans and nature at Tallgrass Prairie National Preserve

The legacy of dualism is also evident at TPNP. It protects a large remnant of the tallgrass prairie, an ecosystem that the first Euroamerican experienced as an inhabited "wilderness" before plowing it under. Because the soil is poorly suited for grain crops, the region was available for large-scale preservation when American opinion came to value prairie ecosystems (see Tallgrass Historians L.C. 1998).

Discussions about preserving this region began in the 1920s, but local public opinion in the region has been reluctant at best. Because private land trusts were more acceptable to the local community, Congress established TPNP in 1996 as a unique public-private partnership. The NPS is prohibited from owning more than 180 acres in TPNP, but the NPS provides the bulk of the staff and maintenance budget. Conservation trusts contribute over 10,000 acres to the reserve. Texan millionaire Ed Bass helped the trusts buy the land; in exchange, his cattle graze on most of the pastures in the preserve. As a result, TPNP remains a working cultural landscape.

This history poses one of the challenges for interpretation today. Within a dualist framework, the NPS struggles to make sense of an endangered ecosystem being preserved because Euroamericans only found it useful for cattle grazing. If it represents the cultural landscape of settler ranching communities, then the cattle that graze in the park should remain there. If, in contrast, TPNP preserves a natural landscape, then the park should include wilderness designations and perhaps exclude cattle.

Interpretation emphasizes the prairie ecosystem, the human experiences on this land, and the relationships between them, reflecting "influence of the land on the people and the people on the land" (NPS 2005, 16) Interpretation also features the preserve's model of "public/private partnership dedicated to preserving and enhancing a nationally significant remnant of the tallgrass prairie ecosystem and the processes that sustain it..." (NPS 2005, 11). The park brochure interprets continuity between Native American and rancher uses of the land (NPS 2008). It begins with the native peoples who lived here, and signs at the Spring Hill Ranch continue this theme. At the same time, the management plan says that the park's viewshed "offers opportunities for extraordinary and inspirational scenic views of the Flint Hills prairie landscape." (NPS 2000, 8). Despite the supposed lack of "modern intrusions," the park also explains how the NPS seeks to restore nature from its human uses—including a railroad spur, corrals, fences, and roads at the Fox Creek site.

Taken together, these claims are incoherent if seen in dualist terms—humans are present and absent, with and without impact. The environmental trusts do not challenge this perspective, recognizing that they were able to preserve a natural prairie landscape only by preserving part of it as a cultural landscape.

A visitor might reasonably ask if we can restore "nature" at TPNP, why not restore a prairie "wilderness"? The park's paradoxical answer is that restored nature cannot be wilderness because even the restored landscape will retain evidence of historic human use (NPS 2009a, 20). Most of those signs of human use concern livestock grazing, but grazing is an allowable use of designated wilderness areas.

The NPS might try to rethink wilderness at TPNP, interpreting wilderness *as* a human use, one that allows recreation, grazing, and aesthetic appreciation. However, dualism gets in the way. Rather than merely playing catch-up with the scholarship, TPNP provides a place where the NPS could participate in the wilderness conversation as it unfolds. Instead, like Homestead, TPNP

still reflects dualist inertia. Yet both sites' dualisms are complex, laying the foundation for more innovative approaches in the future.

Connecting nature to multiple histories at Effigy Mounds

Effigy Mounds National Monument (EMNM) lies along the Mississippi River in northeastern Iowa. It protects a unique set of earthen mounds that date to about AD 600-1150, built in the shape of animals, mostly bears and birds. It also includes many non-effigy mounds in geometric shapes that were often used for burials.

Some people proposed a "Mississippi National Park" in the 1920s that would have encompassed many of these mound sites. Though the NPS rejected a Mississippi park for lacking the monumental scenery of Western parks, it recommended establishing a national monument to protect the most important mound sites (NPS 2012; Lenzendorf 2007, 71–80; O'Bright 1989). With the support of both Congress and the State of Iowa, President Harry S Truman proclaimed such a national monument in 1949.

Where Mississippi National Park might have been, we now have a fragmented landscape with many state parks, state conservation areas, and game management areas scattered across Minnesota, Wisconsin, Iowa, and Illinois. The largest of these is the Upper Mississippi National Wildlife and Fish Refuge, which encompasses 200,000 acres stretched along 260 river miles. These various units define a complex landscape of public and private property, serving various purposes.

To a degree, EMNM can serve as a visitor center to interpret the stories of the wider region. The NPS rises to this challenge. It emphasizes the mounds and the mound builders, the nature and scenery of the area, and a cluster of relationships among these themes: between mound builders and nature, between modern people and historic people, and between modern people and nature.

The visitor center and trail guides describe the cultural continuity between mound builders, their successor agricultural culture (Oneota), and the Ioway, Otoe, and other Siouan-speaking tribes of the region in historic times. These people still live nearby, as Chloris Lowe of the Ho-Chunk nation reminds visitors to the North Unit Trail:

> We ask that as you walk over this land to please remember this is sacred ground to those of the mound building culture. The descendants of this culture are not a lost people but rather living, thriving American Indian cultures that today reside in what is now called the Midwest. These Native descendants continue to honor their ancestors buried here in religious ceremonies on these sacred sites. Please enjoy and respect your time among the "Old Ones" as their spirits will watch over you while you are here.

While emphasizing resource protection, the sign makes a secondary point about cultural continuity. The NPS also highlights Native American relations with Euroamerican explorers and early traders, who created "relationships with one another that changed each." The visitor center glosses over the process of conquest, while shifting interpretation to the archaeologists who investigated the mounds. After a period of excavation, the park realized that the mounds constitute part of a sacred landscape that remains important to modern tribes. The NPS removed human remains from display in 1971.

By requiring consultation with the modern peoples affiliated with those human remains, the 1990 Native American Graves Protection and Repatriation Act reinforced these changes. Consultations with the twelve affiliated tribes helped shape a new approach to interpretation that characterizes the site today. Upgraded exhibits in 1988 focused on the relationship between the mound builders and changes in the natural environment, such as seasons, drawing on oral tradi-

tions and contemporary spiritual practices to help illuminate the meaning of the mounds to the people who built them.

Overall, EMNM allows the NPS to interpret prehistoric peoples in ways that avoid assumptions about the nature of "wilderness" and the role of humans within it. The NPS interprets the mound builders' relationship with the natural environment. The NPS brings the story forward to contemporary native peoples of the region while also discussing modern uses of the land by non-Native Americans. The site chooses not to use words such as "wilderness" or "civilization," but simply "people" or "culture"—applied to modern, historic, and prehistoric peoples alike. In addition, by interpreting the mounds as part of a wider landscape, park interpretation here takes this national monument some distance toward telling the stories of the Mississippi National Park that never was.

Conclusions

We are accustomed to think of the national monuments and national historic sites as junior members of the national park system. They are smaller, less prestigious, less well-known, and generally less popular postings for NPS staff. We imagine that ideas from the big, "crown jewel" national parks trickle down through the rest of the system.

This paper shows that smaller sites have things to teach the big, famous parks. The great scenic parks imagine themselves isolated from the civilization that surrounds them, and tell a dualist story of human relations with nature. The historic sites and monuments are under no such illusions. They know that preserved lands are but a part of a larger human matrix, and they tell stories of human relationships with nature.

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Teaching the Parks

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In 2005, Richard Louv's *Last Child in the Woods* crystallized many people's concerns that today's youth no longer spend much time outdoors (see also Pergams and Zaradic 2008). This "nature deficit" may be connected to modern plagues such as attention-deficit hyperactivity disorder, stress, depression, anxiety disorders, and childhood obesity. Public land mangers often fear the current generation will fail to support outdoor recreation (see America's great outdoors).

While discussions have focused on K–12 students, this paper discusses college-level courses that the principal author has offered in national parks over the last five years. These courses focus on the politics of the national parks—Grand Tetons and Yellowstone (three times), Mammoth Cave (four times), Great Smoky Mountains (once), and Indiana Dunes (once). We will discuss only the Greater Yellowstone and Mammoth Cave experiences here. This paper's key finding is simple: students like experiential courses, they learn a lot in them, and they evaluate them favorably. They generally emerge with a greater sense of stewardship.

Course objectives and theories of experiential learning

Field experiences confront academic knowledge with reality on the ground, including the physical landscape, fauna and flora, and social setting (Cantor 1997; Dewey 1977; Kolb 1984). Applying one's assumptions to a new environment can also encourage personal development (DeClair 2004; Gilin and Young 2009).

The specific goals depend on the overall course. All the courses helped students become aware of their personal understandings of "wilderness." Wilderness values helped students examine possible threats to the environment in the national parks, including threats from tourists such as ourselves. Cave tours in Mammoth Cave provide an excellent opportunity for these discussions because they include improved trails, lighting, restrooms, a picnic area, and a café.

Students in the Greater Yellowstone course learned about wildlife management issues when they observed species in the wild, both salient species such as elk, bison and wolves, as well

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as less-salient management concerns surrounding trout, mountain goats, and pronghorn. The courses also sought to develop non-academic skills including team-building, group work, and problem-solving. Students faced new experiences such as erecting tents and wildlife encounters, with instructors as adult mentors for such skills (see Louv 2005).

Course design

Course design initially reflected the senior author's experience with short-term summer abroad programs in Vienna, Austria. Drawing on theories of experiential learning as a four-stage cycle, based on concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb 1984), Pahre designed the field experiences in equally-foreign Wyoming. Modifying the final stage, we identified these stages as EORS: experience, observe, reflect, and share. These stages provide the foundation for students' daily reflections.

To encourage personal development in the parks, we camp in tents and cook our own meals. Hikes of varying difficulty providing variable amounts of "challenge" and bring site-based features to class discussion. Discussion helps both individuals and the group construct the meaning of their experiences (e.g., Baker et al. 2002; Katula and Threnhauser 2003; Kolb et al. 2002; Patterson et al. 1998). Dinner conversations provided "official" discussion of the course readings and issues raised by the day's activities. Informal trailside conversations create a one-on-one emotional space, creating a space for quieter students to be heard.

The courses include written assignments both before and after the experience. A workbook uses the EORS framework for daily reflections. Other worksheets are organized by wildlife species (e.g., bison), management problem (e.g., wildfire), or human-nature relationships (e.g., tourism).

Course design also considers the non-academic aspects of the program. *Anticipating* a challenge provides an important part of the overall experience and a way to define the meaning of the experience (e.g., Patterson et al. 1998).

Many students were afraid of nature in some way (Louv 2005; McIntyre and Roggenbuck 1998), such as bears in Yellowstone. Some were anxious about their fitness level, especially at altitude. Knowing this, we plan events so that anxiety has a reward. A narrow trail with exposure just below Inspiration Point in the Grand Tetons is difficult for some students but has a spectacular viewpoint just beyond. Claustrophobia has been a challenge for some students in Mammoth Cave, and we work with students to address their specific challenges.

Learning how to combine the academic and non-academic elements of the course takes two or three visits before the instructor feels comfortable "teaching the site." While experiential theory has been very helpful, experience proves to be the best teacher for the teachers as well.

Recruitment and demographics

John Dewey (1977; see also Kolb 1984) saw experiential learning as empowering and democratic, serving nontraditional students who might struggle in a traditional learning environment. Our courses may not have reached underrepresented groups in traditional demographic terms (Table 1). Whites are somewhat over-represented in these courses compared to the university's population as a whole, as are women.

The two types of courses differ considerably in their demographics. The Discovery course, which is free to students and requires only a three-day weekend during the semester, is more successful at attracting African Americans than the Yellowstone course is. In contrast, the Yellowstone course is more likely to attract Latinos and especially Latinas. Yellowstone also attracts a higher percentage of GLBTQ students than the Discovery course.

Instead of comparing the students to the population of Illinois, or the general characteristics of the population of the University of Illinois, we might compare the students to the population

	Discovery		Yellowstone		Total	Campus[2]
N	46	Percent	30	Percent	Percent	Percent
White	39	84.8	24	80.0	82.9	64.9
Asian-American	3	6.5	3	10.0	7.9	16.6
Black	3	6.5	1	3.3	5.3	6.3
Latina/o[1]	1	2.2	3	10.0	5.3	8.7
Latina/o or non-white[1]	7	15.2	6	20.0	17.1	N.A.
Female	25	54.3	16	53.3	53.9	46.0
Male	21	45.7	14	46.7	46.1	54.0
GLBTQ	NA	NA	5	16.7	NA	3.5[3]

1 Latina/os may be of any race. Transgendered people are classified by the gender with which they identify.
2 Campus figures are for Fall 2012. Percentages exclude international students.
3 Gallup reports that 3.5% of Americans identify as LGBT (www.gallup.com/poll/160517/lgbt-percentage-highest-lowest-north-dakota.aspx).

Table 1. Demographics.

of backcountry users. Oosterhous et al. (2007) find that Yellowstone backcountry users are dominated by single young males, followed by families seeking togetherness and nature experiences. In their study, 71% of our respondents were male, 94% were Caucasian, 46% were married, 55% were age 35 or younger, 73% had completed college, 49% had an annual family income of greater than $60,000, and 20% came from metropolitan areas with a population of more than one million people.

The Yellowstone course brings a more diverse mix of people to the backcountry (Table 1) mostly because the population of Chicago differs from Yellowstone backcountry visitors at large. Our students are also more diverse (64.9% white) than other users of Yellowstone's backcountry (94% white). In short, the students in these courses are similar to the University population but different from the population of backcountry users in desirable ways.

Students' anticipated outcomes in the Yellowstone course

Prior to departure, many students imagine Yellowstone in terms of the tourism experience. They anticipate seeing wildlife, natural beauty, open spaces, and Yellowstone's thermal features. They expect academic outcomes such as learning about park management, wildlife, ecosystems, and the human impact on the environment.

Students generally anticipated a transformative experience (see Patterson et al. 1998; cf. Sax 1980, Chapter 4 for the national parks). For example, one student expected that the experience would help her become an impassioned advocate for wildlife and wilderness—though she did not define herself as already being such an advocate. Many anticipated personal growth, a "life experience," learning more about oneself, or an opportunity to rethink career goals.

Reported outcomes

Both academic and non-academic outcomes were largely consistent with the expectations described in the experiential learning literature. In a course on environmental politics, that we have

regularly taught both in the classroom and online, students often struggle to understand the trade-offs in the NPS Organic Act's mandate to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same…." After the field experiences, students understands these trade-offs very well. One student described the learning experience this way: "I had a preconceived notion that Yellowstone completely fit the definition of a wilderness area. I had never dreamed that there would be as many amenities as we saw nor the amount of roads and hotels." Without experiencing the park, it would be hard to reach this kind of judgment. The same issue frames much of the discussion during cave tours at Mammoth Cave, which has a significantly developed infrastructure.

Students discover that managing visitor impact begins with understanding one's own impact. One Yellowstone student commented "I'm more conscious of myself as a tourist too." Practicing leave-no-trace principles is one of the course requirements. Students also learn how to practice bear safety in camp, and how to view wildlife safely without disrupting natural animal behavior.

Experiential learning forces students to confront a singular place in all its complexity, so tends to draw on multiple disciplines. Students often listed the multidisciplinary nature of the course as its "most beneficial" aspect. One said, "I learned about biology, wildlife policy, and politics all in one course"; another liked that the Yellowstone course "brackets political debate and natural sciences."

As experiential theory would suggest, reflection in journals plays a key role in the learning outcomes. One student "loved the idea of the journals, a great way to learn and stay organized when traveling and camping." Many appreciated shared reflections in conversation: "As a group we came up with great questions and were all able to feed off of each other's ideas. Every night there was a new door opened on a topic that some of us had never thought about."

Reflection and discussion encourage students to find meaning in their own experiences. After that, they think about how the same place might have different meanings for other people. Though disappointed that the highly-developed site at Artist Point (Yellowstone) harmed the group's experience, one student wrote, "I concluded that the Park Service was not wrong for developing areas like the overlook even though it may take away from the richness of an individual's perceived experience of those areas." This experience enriched the student's own understanding of the parks but also provides insight into the pressures the NPS faces in thinking about development.

After having read academic work on the parks, Discovery students seemed especially appreciative of the field experience. One reported that "the trips … helped me to understand what the parks are like." Another student said, "the trip allowed me to realize that what we were studying was real." In various ways, several students said the best part of the course was "Seeing everything first hand on what we have read and discussed."

As experiential learning theory would predict, hands-on learning, applying abstract academic work to concrete subjects in the field, reflections about the experience, and higher student motivation characterize these courses. Students report that "I learned more in those seven days than I ever did in a classroom at school."

These reflective academic experiences can be personally transformative. Though Yellowstone students are most likely to report major personal growth, those in the Discovery courses also report transformative experiences. One called it, "amazing and life changing." They generally cite the field trip as the best part of the course, often as the best part of their first semester at college.

After returning home, the Yellowstone students often cite physical challenge as an important part of their experience. One reports that "it really pushed me to my limits, emotionally and physically." After a backcountry approach to the Grand Canyon of the Yellowstone, another student said that "my group had earned the beautiful view we saw because we worked for it and by

working for it we somehow appreciated the canyon more than anyone else." Such constructions of meanings are a key component of experiential learning theory.

Challenges also brought about personal growth. One student said, "I learned a lot about our national park system while also learning a great deal about myself." Another explained how the experience gave them an appreciation of the aesthetics of nature: "It is one thing to talk about protecting the landscapes and ecosystems from a scholarly perspective, but there is no way to fully understand and appreciate the value of the land being discussed unless you can see and become immersed in it. Just by being there, in the face of such scenery, I was hit by how immense just the pure intrinsic aesthetic value of the park is, and thus affirming my belief of how important it is to preserve such areas."

Such reflections energized some students politically. One wrote that meeting activists at the Buffalo Field Campaign, combined with frequent viewing of bison calves, made her want to be active on the bison issue. Another wrote that, "as I learned about ecosystems like this one, I was surprised how angry I became. I was mad at humans for being so selfish to pollute the Earth constantly without any thought as to how their actions would impact it. I was upset at myself for not caring before and making decisions that would hurt the planet."

These findings are consistent with some recent research on the political consequences of outdoor experiences. Zaradic, Pergams, and Kareiva (2009) found that hiking or backpacking experiences could lead to about $200–$300 in donations to conservation groups 11–12 years later. Our students were introduced to outdoor skills, hiking, the experience of reaching a mountain summit, and successfully navigating close trail encounters with large animals. We hope they will continue to seek out such experiences in coming decades.

Formal evaluation

Evaluation is the weak link in the literature on experiential programs. Most of the literature consists of "show and tell" pieces like this one, in which instructors summarize what they have done. Evidence of effectiveness relies heavily on student self-reporting of their own learning.

There is little evaluation of alternate ways to achieve similar educational outcomes. The literature acknowledges that it is hard to conduct an ethical experimental intervention. Random assignment is almost assuredly unethical, and double-blind experiments are plainly impossible. Selection biases are rampant because the students who choose these programs differ from the overall population in both known and unknown ways. Professors who teach these courses also differ from the faculty as a whole.

Given those challenges, student evaluations provide the primary evidence of learning outcomes. Student evaluations of both professor and course are very strong (Table 2). Similar results are common in experiential programs offered by many professors at many universities.

Conclusions

In political science, undergraduate education tends to emphasize the "view from Washington" and not the view on the ground. Field experiences shift the student view dramatically. Seeing how policies work in the field helps students understand how policy changes in Washington affect human impact on the natural environment, wildlife, and wilderness.

We are fortunate that the University of Illinois has been supportive of these experiential courses. Some faculty take advantage of the opportunities for experiential teaching, but they have no particular professional incentives to do so. Field experiences can be expensive for students, time-consuming for faculty, and require significant investment from universities. Skeptics will reasonably wonder whether the learning outcomes justify the additional investment.

		Mean evaluations, scale from 1 to 5			
Semester	Type	Instructor	Course	Learning	Motivation
Summer 2009	YST	5.0	5.0		
Summer 2010	YST	5.0	5.0	5.0	5.0
Spring 2010	DSC	4.5	4.3	4.3	4.2
Fall 2010	DSC	4.5	4.3	4.2	4.3
Summer 2011	YST	4.8	4.7	4.7	4.7
Fall 2011	DSC	4.9	4.6	4.6	4.2
Fall 2012	DSC	4.8	4.5	4.6	4.3
YST = Yellowstone, DSC = Discovery Course (Mammoth Cave)					

Table 2. Student evaluations.

We believe that over 100 hours of sustained, engaged experiences is much more productive than the mixed levels of engagement exhibited by students over the course of a 15-week semester. Technology is forcing us to rethink how we teach, highlighting the weaknesses of the large lecture hall. While some learning tasks will migrate online, field experiences can offer hands-on, experiential learning that connects the classroom to the world.

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Can Organizations Learn? Exploring a Shift from Conflict to Collaboration

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Both organization theory and practical experience tell us that organizations mired in conflict have a more difficult time accomplishing their goals than organizations that are not. The transaction costs associated with conflict—money, staff time, lost opportunities—consume resources that otherwise could contribute to pursuing primary organizational goals. Given that natural and cultural resource management agencies are perpetually resource-poor (i.e., there is never enough of what is needed to meet the demands of the agency), any reduction in organizational conflict could be valuable. Conversely, failure to learn and adapt would suggest a significant agency deficiency, or that learning is less useful than other responses.

This paper explores organizational learning in Mexico's National Institute of Anthropology and History (hereafter INAH, its acronym in Spanish). INAH's responsibility is to support research, analysis, protection, and dissemination of Mexico's archaeological and anthropological heritage; it manages cultural, but not natural, resources. Founded in 1939, INAH is housed organizationally under the Secretary of Public Education, a decision reflecting its role in educating the public about the cultural and historical contributions of Mexico's indigenous population to contemporary society. INAH's jurisdiction ranges from any subsurface archaeological remains, to the exploration and protection of sites, ranging in scope from individual houses, to pyramids and monumental complexes, such as Teotihuacan, Tajin, or Chichen Itza (Olive Negrete and Castro-Pozo 1988).

Here we focus on two World Heritage sites in Oaxaca, southern Mexico. In 1987, the city of Oaxaca, and the nearby archaeological site at Monte Alban, were among the first Mexican nominations to World Heritage status. In 2010, an assemblage of caves and related features between Yagul and Mitla also were inscribed on the World Heritage List as "Prehistoric Caves of Yagul and Mitla in the Central Valley of Oaxaca" (hereafter referred to as "Las Cuevas," as the site is known locally). While the colonial architecture of the city of Oaxaca, and the spectacular temples

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and pyramids of Monte Alban, are obvious to even the most obtuse observer, the significance of the rock shelters, pits, and caves distributed along the rough hillsides between Yagul and Mitla is invisible to all but the most determined archaeologists. The central question is whether INAH drew, from its sometimes turbulent history of managing Monte Alban cultural resources, any lessons likely to reduce conflict in developing management strategies for Las Cuevas.

Understanding context

Two central features of organizational context are especially relevant here. First, as a central government agency endowed with monopoly power over Mexico's archaeological sites and materials, INAH considered itself in an unassailable position relative to potential challengers. In a country where political centralization concentrated agency power in Mexico City, bureaucracies there appeared to have few possible rivals. In Oaxaca, as elsewhere, local communities were often the formal owners of the land, but presidential decrees placed sites under INAH's oversight regarding excavation and development, and local communities had little practical possibility of constraining INAH via governmental structures and processes. While communities owned the land, INAH possessed the legal and financial capacity to determine its use. Second, it is important to recognize that INAH and the local councils governing indigenous communities had very different understandings of how decision processes functioned when they met to address points of ambiguity, disagreement, or conflict. These differences in organizational worldview generated recurring confrontations, as INAH sought to assert control over jurisdictional boundaries, land use, resource access, or other areas it considered under its domain, while communities pushed back in defense of what they considered to be historical rights, or matters central to community survival.

Appreciating INAH's dominant value system in the 1970s through the 1990s is particularly important in assessing its learning capability. Beyond the great weight attributed to its legal position, in a system where written laws and rules define the arena of discourse, INAH's decision-making system placed great emphasis on hierarchy and segmentation. Critical decisions were reviewed at several levels and passed through multiple offices, depending on subject matter. Depending on their nature they might also be subject to review by the Council of Archaeology (responsible for all archeological projects in the country), and possibly outside agencies. INAH also attached a high value to expertise, to the point where it runs its own university, the National School of Anthropology and History (ENAH for its acronym in Spanish). ENAH trains the vast majority of Mexico's archeologists, and many of INAH's archeologists spend some time assigned to ENAH as instructors, managing interns in field projects, reviewing theses, and otherwise influencing the next generation of archaeologists. One consequence, however, is that the experiences and views of the current generation will be imprinted on the next, a developmental process making change slow and uncertain.

In contrast, Oaxacan village communities generally depend on councils selected in popular assembly through extended discussion, a process intended to produce a consensus regarding community leadership for periods of three years. Internal friction and feuds are not uncommon, but communities strive to present, to the outside world, an appearance of solidarity, and a willingness to engage in overt confrontation to defend community interests. Tradition and at least formal deference to the principle of consensus offer a sharp contrast to INAH's emphasis on national law and hierarchical structures. Attention to solidarity, and highly developed strategies for resisting INAH's attempts to frame and control agendas (e.g., prolonged discussion in indigenous languages in the face of INAH representatives) become mechanisms for pushing back against national government's assertion of policies and programs (Robles García and Corbett 2010).

Nowhere is this more evident than in the differing attitudes toward conflict. To INAH, conflict is, at best, an impediment to rational organizational behavior and, at worst, a reflection of

organizational failure. Conflicts cost time and money, and may complicate relations with other agencies and jurisdictions, disrupt an array of stakeholders, and impede the attainment of organizational goals. Local conflicts are to be avoided, particularly if they might filter up the hierarchy, and cause headaches and adverse public reaction in Mexico City. Locally, conflicts might be a nuisance to a site manager or state-level director, but in Mexico City they are an embarrassment, as they suggest INAH is not capable of managing its responsibilities.

For communities, conflict can be beneficial. It serves as a rallying point, as the local David takes on the aggressive outsider, Goliath. It underscores community solidarity, and suggests the community's long-term interests are at risk. Especially in circumstances where local INAH professionals or managers must confront mobilized communities, physical intimidation is a time-honored resistance mechanism. While seeking ways to manage and diffuse conflict may appeal to INAH functionaries, their community counterparts may see little reason to acquiece.

The Oaxaca World Heritage experience

The 1987 announcement of World Heritage status for the archaeological site of Monte Alban led to the demarcation of an official archaeological zone by President Carlos Salinas de Gortari, in 1992. The declaration of the zone did nothing to alter ownership of the land included; it remained in the hands of communities or, in some cases, private owners. But it conferred on INAH the authority to manage land use, such as housing, or other practices likely to disturb archaeological materials, for example, excavation, or removing stones for construction material. While at remote locations such changes might have little overt impact on the landscape, the Monte Alban site represents the largest empty space adjacent to the city of Oaxaca, and the attractiveness of finding a housing location with proximity to urban services and employment was matched by the willingness of communities to "sell" lots for housing or other purposes, even when legal prohibitions existed. For example, the prospect of selling 240 square yard lots for six months' salary (at minimum wage) was a strong temptation. That such transactions had no legal basis mattered little, as long as everyone, from buyers to local authorities, pretended they did.

In such circumstances, INAH struggled to enforce its authority over land use but had few resources at its disposal. It lacked funds to purchase land outright, and faced legal barriers to purchase because frequently no one had clear title. Community officials saw no benefit in enforcing the legal claims of INAH against their own neighbors and relatives; after all, the community officials had to live in the community. While theoretically INAH could call on federal law enforcement, in practice this was problematic. Beyond the sheer number of cases, few federal agents were tempted to spend their time dispossessing elderly women from hillside shacks when there was more public approval in chasing narcotics dealers or automobile theft rings.

Much of the 5000-acre Monte Alban archaeological zone historic uses included grazing, native foods and herb gathering, and collecting firewood. Though nominally benign, such uses resulted in erosion, cooking fires spreading out of control, and other threats to the site's hillsides and vegetation. Although INAH staff responded to abuses when they could, the 20-mile perimeter of the archaeological zone, unfenced and largely unpatrolled, was extraordinarily vulnerable to penetration and displacement (Corbett and González Alafita 2002).

A dozen years of change

Starting in the late 1990s, recognizing the deficiencies and frustrations of the prevailing model, a new management team introduced an approach resembling cultural resources management (Cruz González 2012). While the shift in Monte Alban's leadership was fortuitous, rather than planned, one consequence was a new approach to working with the communities in the archaeological zone. A staff archaeologist assumed explicit responsibility as a community liaison, meeting

with community leadership and other interested residents on a regular basis. Rather than treating neighbors as a source of unending headaches, the new approach sought to be proactive, and to recognize that community leaders pursued quarrels with INAH as a way of responding to political pressures and other concerns within the community, rather than because there existed fundamental problems with INAH. INAH, while having an extensive cadre of anthropologists, had made little use of its own human resources to developing ways to work with testy neighbors.

The Monte Alban management plan, the first for any zone in the country, explicitly recognized the importance of the site–society interface, and that without attention to the population outside the boundary, it would be difficult to manage the land inside it (Robles García and Corbett 2011). This proved a special challenge because INAH is not a land management agency, and does not have statutory authority to address land-related questions not associated with cultural resources. During the dry season, wildfires starting outside zone boundaries frequently burned into the zone, but there were no provisions in the INAH budget for firefighting; staff fought fires with brooms and machetes. By approaching outside funders, and through training agreements with Oaxaca state agencies and Mesa Verde National Park, Monte Alban developed its own wildfire response capacity that included neighboring communities (Robles García and Corbett 2007). Now fire response is possible before the fire enters the zone boundary.

The new strategy also recognized the importance of the archaeological zone as a potential source of income and employment for the local population. While little of the land is fertile enough for significant agricultural production, most of it can be used for grazing. Where grazing has been restricted, or wood-cutting disallowed, the communities suffered economic losses, while most of the gain associated with tourist visitation has accrued to the hotels, restaurants, shops, and taxis in the city of Oaxaca. By looking for ways to give community residents hiring preference for maintenance and custodial work, by creating opportunities to sell crafts or other goods, and by creating other links between the archaeological zone and surrounding communities, there has been some success giving the communities an economic stake in the site's survival and success.

And there have been some creative projects connecting the zone and local communities. Monte Alban developed its own plant nursery to nurture more than 30,000 shrubs and trees annually. INAH staff, volunteers, and community members engage in reforestation projects intended to reduce damaging runoff down the hillsides into inhabited areas below, produce collectable fruits, and revitalize much of the zone as a major green space, accessible to Oaxaca residents. A very popular junior ranger program brings children from neighboring communities to Monte Alban, during periods of high visitor traffic, to act as monitors for fragile structures and otherwise remind visitors of the importance of cultural heritage stewardship (Robles García and Corbett 2008). When these children go home at night with their INAH cap and whistle, they carry the message that Monte Alban is as much theirs as it is INAH's.

And now to Las Cuevas

The 2010 inclusion of Las Cuevas on the World Heritage List creates an interesting challenge in that much of INAH's senior administration in Mexico City are products of the ENAH, and a long period of socialization as part of the INAH hierarchy. There has been little reason to expect INAH to embrace the changes in practice seen at Monte Alban since the late 1990s, particularly as INAH's top administrators (appointed by President Enrique Peña Nieto) were veteran career employees with little interest in new approaches. Their unexpected removal in summer 2013, for reasons unrelated to Oaxaca, triggered policy and leadership uncertainties that remain unresolved. Such uncertainties are particularly wearing for middle-level professionals, most of whom work on renewable six-month contracts, while trying to establish institutional arrangements that will take years to mature.

To the extent administrators on the ground in Oaxaca have worked at Monte Alban or are familiar with the community-focused efforts there it is possible early attempts to build effective relations between the World Heritage site and those communities with land inside the official site boundary may be productive. For example, rather than build a single interpretive center near site headquarters, INAH opted to work with affected communities to make sure each one has a local center. Not only does that contribute to the sense of participation, it also indicates that INAH recognizes the potential such centers may have for generating visitor traffic and employment. INAH has also begun to look for collaborative arrangements with non-profit organizations that could provide services or opportunities.

Yet INAH's engagement of the Las Cuevas communities does not take place on a blank canvas. Other federal agencies compete with INAH for influence, budget allocations, and patronage. To the extent that INAH's reputation as a potentially heavy-handed regulator precedes it, other agencies may gain favor by extending services. The secretary of communications and transportation has a responsibility for road-building, not protecting vestiges of ancient irrigation works or house sites, and the Federal Electrification Commission is more interested in building transmission lines than protecting cultural landscapes. Las Cuevas is adjacent to the growing service center, Tlacolula de Matamoros, making its empty lands attractive options for housing or other construction. Theoretically, an interagency planning secretariat resolves differences and facilitates coordination, but in practice its effectiveness depends more on the good will and political skills of respective local managers than on official agreements signed by distant and distracted cabinet secretaries.

Indeed, one of the more significant lessons from Monte Alban is the critical importance of team-building for negotiating productive relationships with local communities. Imaginative leadership must work with, and be supported by, a team designed to meet local circumstances, not institutional traditions. For this reason, INAH's local staff includes not only archaeologists and architects, but also botanists and a veterinarian. By highlighting ways in which protection of wildlife species or an understanding of plant evolution may attract visitors otherwise disappointed by a lack of pyramids and temples, INAH's collaborative relationship with communities may bypass the long period of site–society conflict that marked the first World Heritage designation. Decisions regarding policies and personnel within INAH will help us understand how much INAH has learned about conflict with external actors.

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22

Preparing the Next Generation of Protected Area Employees: Opportunities for Students, Agencies and Universities

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Why students are becoming more valuable to protected area managers

Resourcefulness will be a key concept in the next several years for the National Park Service (NPS). Managers across the NPS will have to find ways to keep "the gate open" and the "lights on." Park managers will need to find a way to engage the youth of America, as well as embrace a population that has a changing demographic structure. Park managers will also need to decide how to incorporate new technology to meet the needs of the visiting public while still being stewards of the natural environment. Students are the answer for all of these challenges.

Students have flexible schedules that allow them to work intermittently and in times of need (e.g., weekends, special programs). Students represent a mosaic of our society, and can help protected area managers better understand how youth engage with the natural world, and how to accommodate different cultural preferences. Today's students have been brought up interacting with technology and understand how it impacts not only their own lives, but also the lives of others. As noted by Prensky (2001), today's students are "digital natives" since they have never known a world where technology isn't inherently involved in everything, even natural experiences. Technology, and how it is applied, will best be incorporated into park management by students (and the generation they represent) who engage with it everyday. Actively pursuing students to work for protected areas will provide the energy, insight, and relevance to ensure the importance and even existence of parks in the future. These students will also be the future employees and stewards of our protected areas in America.

Students are a cost effective way to complete projects

Park managers will always find it necessary to find creative ways to ensure projects are completed on budget and on time. Permanent staff is often pulled in many different directions as part of their

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everyday workload, which can lead to projects being delayed or not completed. Students can help by providing dedicated employees that can focus on one project until completion. Students will often be engaged in park projects that cannot be completed in a short period of time; however, their dedicated involvement in that project can move it closer to completion. Students can also bring a fresh perspective, to a project or issue, that may help facilitate completion.

Through programs such as Pathways, high-functioning and high-achieving students can be identified for part-time or seasonal employment. These exceptional students will have a high intrinsic motivation for success and thoroughness, and will also have the extrinsic motivation of completing a project for academic credit. The potential for students to obtain a term (temporary) or permanent position with the NPS may also serve as a strong motivator for exemplary work.

Student research

Of the many ways that students can help NPS managers, conducting research may be the most mutually beneficial. Students, especially graduate students, are often required to complete a thesis or dissertation as part of their course of study, and many want to work with the NPS. The NPS often needs assistance with ongoing projects, some of which a student could easily develop research questions around. Student research can answer questions that managers may have, but do not have the funding or staff to pursue (many students will have funding through their university). Students can incorporate up-to-date scientific methods and analyses (with the assistance of their thesis or dissertation committee) that can inform park planning efforts. Conducting research in a park setting can provide students with an understanding of how research is conducted within a federal agency, which can benefit the student, should they pursue a job with the NPS or other federal entity. Overall, the student gets the opportunity to conduct personally meaningful research for a federal agency, and the federal agency gets the benefit of the student's research outcomes.

Benefits to students

There are several less obvious benefits students gain from working for an agency like the NPS. First, a research study will complete a requirement for their university. This will likely be through the completion of a senior thesis, a master's thesis, or a PhD dissertation. It may also help to satisfy certain course project requirements, or act as an independent study for a student. Second, the experience of working for a park can bridge the gap between the classroom and the "real world." Too often students do not get the field experience they need to be successful upon graduation. Employing students will provide students with a balance between what is discussed in a textbook and how that applies to a tangible situation in the field. This practical knowledge will be a "foot in the door" for students to be hired for term or permanent employment. Lastly, students will have the unique opportunity to "be in the room" or "at the table" when park managers are making decisions. Many times the student will not be a part of the decision-making team, but understanding how decisions are made will provide tremendous insight to the student.

Case studies

The following case studies are from students who have worked for, or are currently working for, the NPS in a student role, as well as from an NPS park manager and a university professor.

Student's perspective, number one

> Working for the National Park Service while completing my master's degree served as a mutually beneficial relationship for both the NPS and myself. The ultimate topic of my thesis came from discussions I listened to, and participated in, while working at the NPS. From subsequent conversations, I was able to identify a topic of study that I was passionate about and that filled a need for the

NPS. Many times, park units have research questions that they would like to investigate, but funding, busy schedules, and the formal approval processes often make such research endeavors out of reach for park managers. As a student, I was able to conduct my research outside of the official NPS Office of Management and Budget (OMB) approval process. While my research was required to pass through my official university review process (Colorado Multiple Institutional Review Board), this process was timelier than the research approval needed when federal dollars are involved.

The information from the research I conducted will be given to the NPS in two ways. First, I have presented my findings at formal federal conferences, as well as more informal presentations to NPS personnel. Second, an executive summary that gives a digestible overview of my findings will be sent to the specific parks where I conducted research, along with a full copy of my finalized thesis. This summary will also be provided to interested subject experts within the NPS as a whole.

Working for the NPS while attending graduate school allowed me to conduct research that is at the forefront of its topic in a way that best serves the needs of the NPS. This work environment also provided me access to subject matter experts who were able to review and inform my research, both during its developmental phase, and the analysis phase.

Student's perspective, number two

I feel like a late bloomer in life. I didn't attend a university until my early twenties and later I enrolled in graduate school in hopes more education could help me start a career in some type of environmental work. It took me four years to finish a master's degree and certificate while working full-time. During this time I also started volunteering for my county's sustainability task force, which helped me earn two part-time positions at small nonprofits (a conservation center and a land trust). These positions helped me gain my next job as the events and marketing coordinator at a community foundation. I was still working on graduate school and could not figure out how all my random jobs would ever help me get my foot in the door with some type of environmental policy work. I didn't even know what type of job would fit me, given all my random skills.

While in graduate school I took a class that helped me get my foot in the door for my job with the NPS. I started asking my professor how he made his way into the NPS. He told me about the student program. I submitted my resume to one of my professor's contacts at the NPS and once I had an interview things moved very fast while we all raced to meet the deadline for the end of the student hiring process.

I couldn't be more grateful to have this job, it's a better fit for me than I ever could have imagined. I didn't even know what "planners" really did before this. Thankfully, my boss saw my skills of marketing, communication, education, outreach, sales, event planning, environmental policy, and GIS as a perfect match for the program.

It's been really wonderful to finally use the knowledge I gained in graduate school. I think I would have been more engaged in my classes and my final project if I had been working at the NPS or another public land management agency earlier in my education, but it's great that now I use on a daily basis class work that once seemed irrelevant to me. I am no longer a student with the NPS, I have been converted to a "term" employee. The best and most unexpected benefit of working for the NPS has been my fellow employees. I have never worked with such a large group of wonderful, hardworking, skilled, and fun folks.

Manager's perspective

[We have utilized several] government programs which allowed for the competitive recruitment of students, targeting skill sets needed by an organization, searching for diversity in candidates, and

hiring current students to recent graduates. These programs for hiring students allowed our division to go from zero diversity in our staff, to 50% in some branches, 30% in others, and 10% overall. Recently we had 25 students working within a division of 65 professional employees. These were career positions traditionally held by permanent career employees. We needed talent, a lot of it, and our vision was to be cutting edge, diverse, and reflective of the nation. Our revenue was double what it had been two years previous and our project workload was triple. We were also experiencing the anticipated retirements from an aging workforce. Our permanent staff dropped 30% in this two-year time period. The numbers tell the story....

Of our 25 students, seven were diverse racially, but equally as important, we recruited, competed, and selected our students from 16 different universities around the country. Nearly all of those students had their undergraduate degrees from different universities, representing even greater experiences around the country. Most students were seeking their master's degrees or PhDs.

Our success was due to a number of factors:

1. We had a vision. We fully knew what our organization needed in terms of skills: technical, leadership, interpersonal. We are a national service center, expected to be the best of the best, and we needed diverse technical skills to conduct the environmental analysis needed for good government decision-making.
2. We utilized some national recruiting forums for African-American and Hispanic students, and to some extent Native American students.
3. We used our network of students to find more students.
4. We created an intense, comprehensive interview and selection process.
5. We were creative, nimble, flexible, and tenacious.

The result is that we have an excellent, vibrant workforce capable of taking our organization into the future with energy and expertise. We were able to convert several students last year to term employees and we intend to convert several more this year. Our students are our long-term workforce, leading the NPS planning and decision-making into the future.

University perspective

As a professor I always look for opportunities to get my students in touch with what drives them professionally. In many cases this is working for or conducting research for a federal land agency, and specifically the NPS. Through a student position with the NPS, students can have the opportunity to contribute to the mission of preservation and recreation while giving the NPS much needed help in a cost effective manner. If a student asks me about how to get a job with the NPS, I almost always tell them to either volunteer as much as possible, or find a student position that could lead to permanent employment. Often times the students can be hired non-competitively if they work over 640 hours for the agency as a student. This situation allows the student to work towards future employment after graduation and also serves the park by bringing on the next generation of park stewards.

Importance of continued support for student involvement

Federal land management agencies, and especially the NPS, have been facing budget shortfalls for many years now, and the future does not look any more promising. Managers struggle to find ways to complete projects and conduct research necessary to meet the mission of the NPS, and with declining budgets and less staff, this is a daunting task; however, it is not an insurmountable one, students can be the answer. By having students involved, managers can recruit the best and brightest to be the future employees at our parks. Managers can continue to recruit diverse stu-

dents that help the NPS with one of its major hurdles in the years to come, maintaining relevancy in a changing society. A large portion (40%) of the Department of the Interior (which the NPS is a part of) is eligible for retirement in the next few years (Dodaro 2012).

Taking all this into consideration, hiring students does not come without challenges. According to a report by the Partnership for Public Service (2009), relatively few students report that they are considering the government (e.g., the NPS) as a potential employer. Also, it is difficult for many recent graduates or matriculated students to compete for government jobs through the competitive hiring system because they do not have much experience. With a temporary reduction in the student workforce via the recent sequester, and the challenges with interpreting the Pathways program (a new student employment program for the federal government), we are at a crossroads. It is imperative that we hold students' interest in a career with protected land management agencies, such as the NPS, and that we weather the storm of current budget cuts. Students are the future of protected area management, and there are still many avenues to bringing on young professionals with the drive, passion, and education to propel protected area management through the twenty-first century.

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Establishing the Science Foundation to Sustain High-elevation Five-needle Pine Forests Threatened by Novel Interacting Stresses in Four Western National Parks

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High-elevation five-needle white pines are among the most picturesque trees in many national parks, as well as other federal, state, and private lands in western North America. These trees often live to great ages; the trees' gnarled trunks give testimony to fierce winds that buffet them on exposed rocky sites. Ancient limber pines (*Pinus flexilis*) in Rocky Mountain National Park occupy the edge of Trail Ridge Road, and a remarkable old giant stands sentinel on the shore of Lake Haiyaha. Limber pines accompany Rocky Mountain bristlecone pines (*P. aristata*) on the exposed ridges around Mosca, Medano, and Music Passes in Great Sand Dunes National Park and Preserve, and Great Basin bristlecone pines (*P. longaeva*) top Wheeler Peak and Mount Washington in Great Basin National Park. Whitebark pines (*P. albicaulis*) grace the rim of Crater Lake and slopes of Mount Scott in Crater Lake National Park. Although the species may occur

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in only small areas within a park, they are ecologically invaluable to landscape dynamics and biodiversity, and vital for watershed protection (Tomback and Achuff 2010).

Whitebark and limber pine are declining across many parts of their range in the United States and Canada because of invasion by the non-native pathogen *Cronartium ribicola* that causes the lethal disease, white pine blister rust (WPBR), and outbreaks of native mountain pine beetles (*Dendroctonus ponderosae*), which are further exacerbated by fire exclusion and a changing climate (Keane and Schoettle 2011). These conditions have resulted in inadequate population size to sustain recovery processes in some whitebark pine ecosystems, and has lead to whitebark pine's endangered species status (precluded) under the Endangered Species Act (USFWS 2011). Foxtail pine (*P. balfouriana*), southwestern white pine (*P. strobiformis*), Great Basin bristlecone pine, and Rocky Mountain bristlecone pine have not yet experienced the major declines observed in northern distributions of limber and whitebark pines, but they are in imminent danger from blister rust and beetles. Restoring declining populations and sustaining the remaining healthy populations present unique challenges for land managers.

In the mid-1900s, several parks, including Crater Lake and Rocky Mountain, participated in efforts to eradicate *Ribes* species, the alternate host to WPBR, in attempt to slow the pathogen's spread. The practice was later deemed ineffective and abandoned in the west, and the rust continues to invade forest ecosystems. A full spectrum of infection intensities and impacts to the white pines are displayed within the National Park Service (NPS). The northern parks, such as Glacier, Mount Rainier, and North Cascades, closest to the point of accidental introduction of the pathogen, have been infected for more than 60 years, and have the heaviest impacts. Only 5–10% of the whitebark pine trees in Glacier National Park remain alive today due to blister rust and bark beetles. More moderate impacts can be found in Crater Lake National Park, the Greater Yellowstone Ecosystem, and other mid-latitude parks and monuments. Further south, WPBR was confirmed in Great Sand Dunes National Park and Preserve in 2003 (Blodgett and Sullivan 2004), and in Rocky Mountain National Park in 2010 (Schoettle et al. 2011). Though impacts by WPBR are currently low in Rocky Mountain National Park, mountain pine beetle has caused high mortality among the pines, and recovery of the limber pine forests may be significantly impacted in the presence of WPBR. New infection centers are being found yearly in the Southern Rockies; it is clear that the pathogen is still spreading, and is now a permanent resident of our landscapes.

Building the science foundation to sustain and restore healthy ecosystems

In this paper, we review the progress of Rocky Mountain, Great Basin, Great Sand Dunes, and Crater Lake national parks in building a science foundation to aid in the development of conservation strategies for high-elevation, five-needle pine ecosystems (Table 1). Due to the current impacts or threat of impacts, each of these parks considers their five-needle pine species of conservation concern. The science provides an assessment of the ecosystems, and reduces the uncertainty related to possible outcomes of interventions and consequences of inaction. Depending on the intensity of impact, efforts are focused on developing restoration activities in declining landscapes (restoration strategy), or proactive interventions in threatened ecosystems to mitigate future impacts (proactive strategy), or both (Keane and Schoettle 2011). Rocky Mountain, Great Basin and Great Sand Dunes national parks are currently following the proactive strategy approach, and Crater Lake National Park is taking the restoration strategy approach. The goal of both approaches is to conserve the species, and promote self-sustaining five-needle pine ecosystems in the presence of WPBR, using available tools and methods that are compatible with land use designations. Interagency collaboration between NPS and U.S. Forest Service has facilitated the progress of these conservation programs in each park.

National Park	Species	WPBR first confirmed	Current WPBR incidence	Active program initiated
Great Sand Dunes	Limber pine	2003	13%	2004
	RM bristlecone pine	2003	localized	
Rocky Mountain (RM)	Limber pine	2010	0% (eradicated?)	2008
Great Basin (GB)	GB bristlecone pine	--	0%	2011
	Limber pine	--	0%	
Crater Lake	Whitebark pine	1941	25% widespread	2003

Table 1. Status of white pine blister rust in the four western National Parks discussed in this paper.

Sustaining population resilience requires maintenance of recovery capacity after disturbance, and genetic diversity to support adaptive capacity over time. Therefore, conservation approaches must incorporate a long-term and evolutionary perspective, which also incorporates adaptation to climate change (Schoettle et al. 2012). Tree longevity is not enough for multigenerational sustainability; sustainability depends on an intact regeneration cycle and, in the presence of WPBR, increased disease resistance to support recovery capacity. These conservation programs include in situ and ex situ genetic conservation, evaluating parent trees for genetic resistance to WPBR, pine regeneration dynamics, planting trials, and monitoring forest health stressors.

Sampling framework

Each of the four parks discussed here has established a different sampling design for their high-elevation pine programs. Crater Lake National Park started its WPBR incidence assessments in 2000 and 2002 (Murray and Rasmussen 2003), with tree assessments within 24 transects, and more recent plots have been installed in additional areas (Smith et al. 2011). At Great Sand Dunes National Park and Preserve, forest health assessment plots were installed in 2004, radiating out from the initial WPBR infection center (Figure 1; Burns 2006). In 2008, Rocky Mountain National Park and the U.S. Forest Service established 17 limber pine sites in the park, and 10 sites outside the park, to serve as the sampling framework for the limber pine conservation project (Figure 2; Schoettle et al. 2011). This cross-boundary network of sites (populations) was stratified by elevation to capture the full breadth of limber pine habitats in the greater geographic area. Great Basin National Park established three areas of concentration in 2011, and additional plot networks, assessments, and samplings are under development.

Ex situ genetic conservation

Across these four parks, extensive seed collections are now archived, and comprise some of the first gene conservation collections for the parks (Table 2). These collections provide insurance against impacts of climate change, seed material for testing progeny of parent trees for resistance to WPBR, and baseline materials for genetic studies to detect changes in diversity. Initial whitebark pine seed collections in Crater Lake National Park targeted healthy trees within heavily WPBR-impacted stands for resistance testing, an approach utilized in tree improvement programs, and

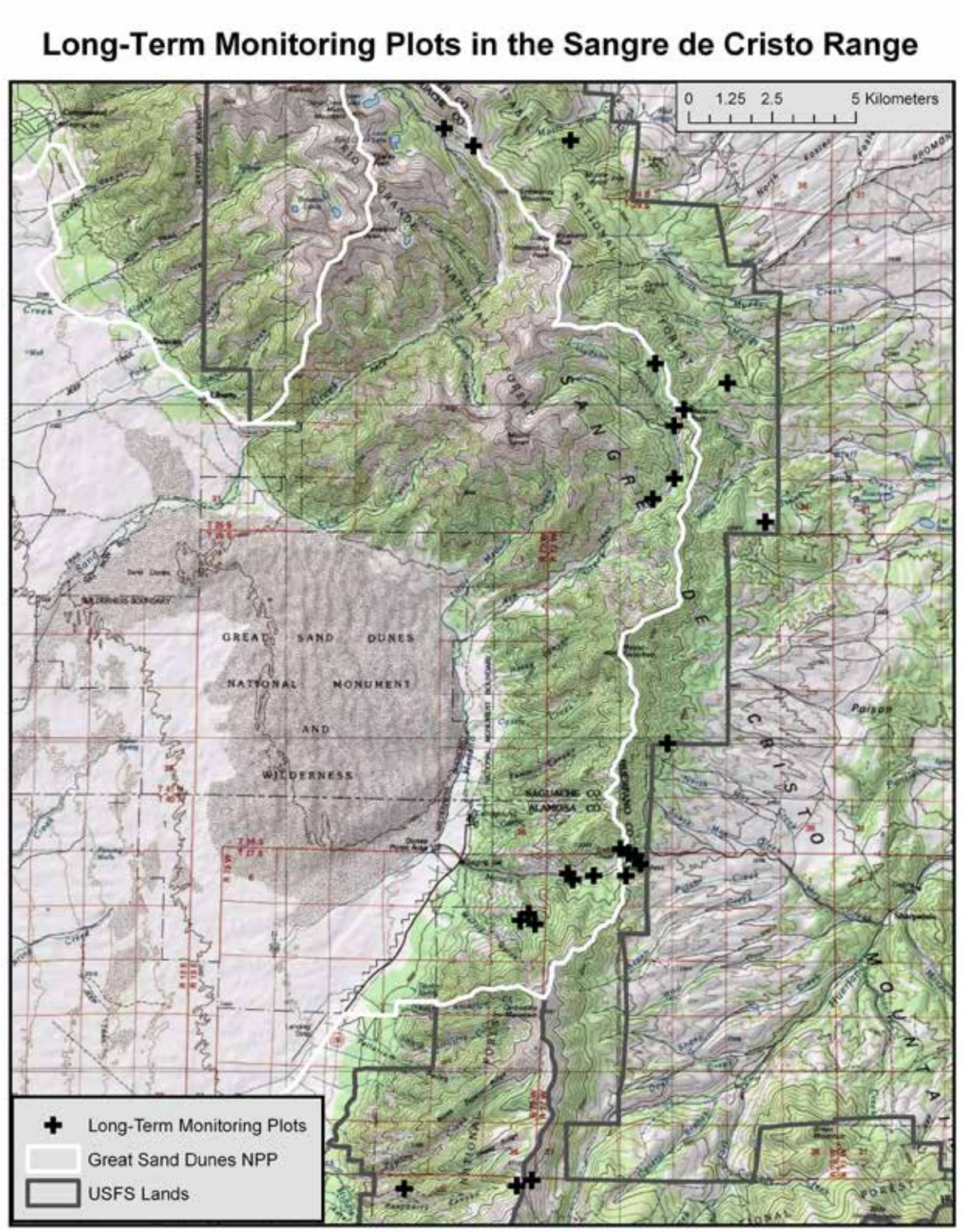

Figure 1. Location of forest health and regeneration assessment plots in Great Sand Dunes National Park and Preserve (adapted from Burns 2006). The plots were first installed in 2004 and are currently being remeasured. Plots include Rocky Mountain bristlecone and limber pine trees; seed collections of both species have been made in the Mosca Pass area.

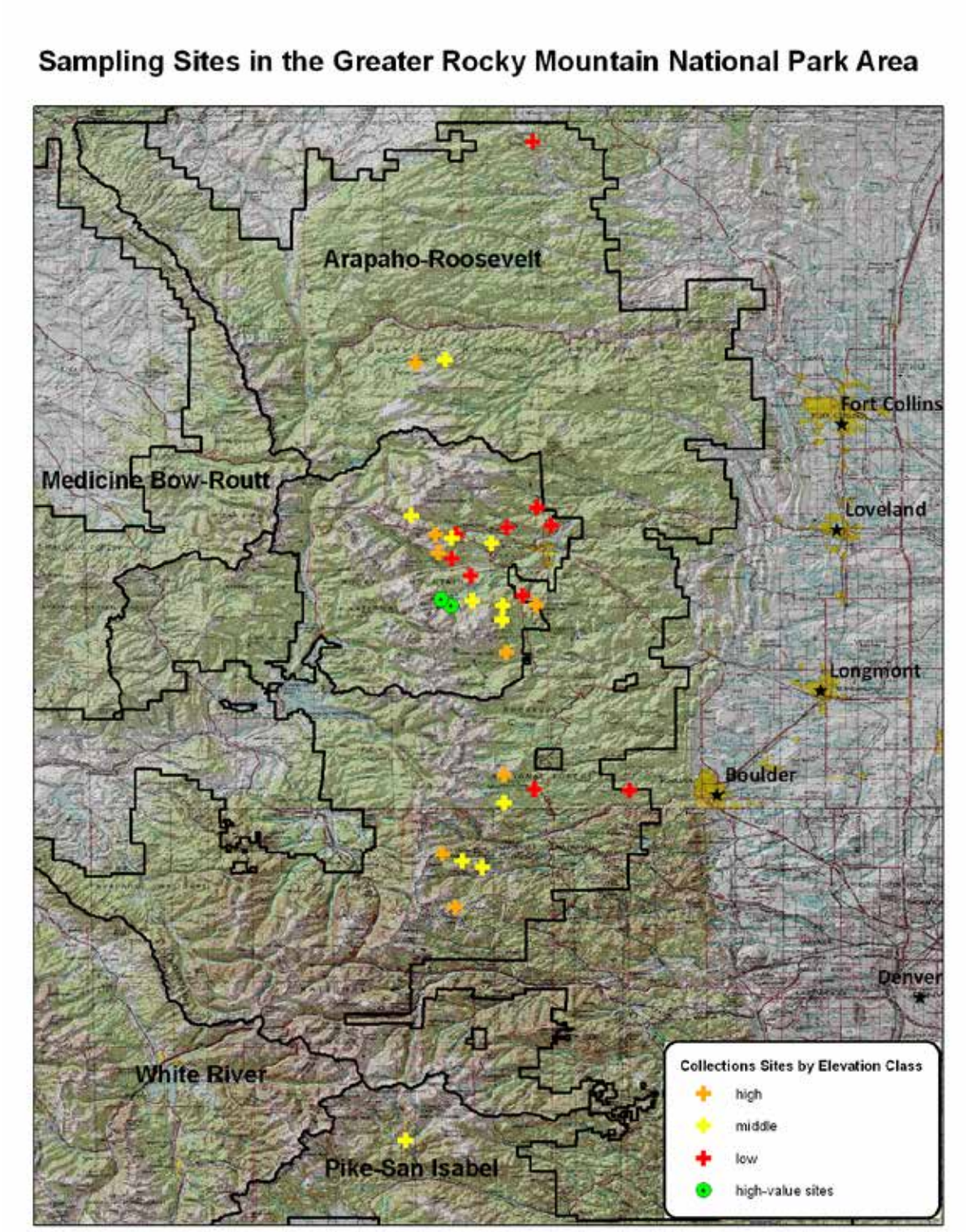

Figure 2. Network of limber pine sites in (17 sites and 2 high values tree sites) and around (10 sites) Rocky Mountain National Park that serve as the sampling framework for the limber pine conservation program (adapted from Schoettle, Klutsch, and Sniezko 2011). The sites were selected to represent the diversity of limber pine habitats in the park. The sites are stratified by elevation; the mean elevation for low, moderate and high elevation sites of 2740 m, 3080 m, and 3320 m, respectively (full elevation range of the sites is 2450 m to 3430 m). Seed collections, forest health and regeneration assessments, and verbenone deployment have been focused in these limber pine populations.

National Park	Species	Individual-tree seed collections	Seed lots in testing	Resistance found?
Great Sand Dunes	Limber pine RM bristlecone pine	39 13	23 (0 from park)	Yes (6/23) (Yes)
Rocky Mountain	Limber pine	213 + 44 bulk	124 + 16 bulk	Yes (18/87)
Great Basin (GB)	GB bristlecone pine Limber pine	9 + 1 bulk Planned	9 + 1 bulk Planned	In process Planned
Crater Lake	Whitebark pine	101	70	Yes (16/35)

Table 2. The number of individual-tree and bulked seed lots from five-needle pine species in each of the four parks currently in WPBR resistance testing at the USFS Dorena Genetic Resource Center (Cottage Grove, OR) and, for those tests that are completed, the number of individual-tree seed lots that demonstrated signs of WPBR resistance is reported in parentheses (# with resistance/# tested). The seed collections are also archived for ex situ conservation. Rocky Mountain (RM) bristlecone pine from other locations in Colorado have shown evidence for genetic resistance to WPBR, yet no lots from within Great Sand Dunes National Park and Preserve have been tested yet. This table does not differentiate among the types of resistance found yet it is accepted that populations with greater diversity of resistance mechanisms will likewise be the most resilient. In most cases, additional testing is needed to comprehensively quantify the diversity of WPBR resistance types present in each species and park.

more recently collection has expanded throughout the park's whitebark pine distribution (Figure 3). Similarly, Rocky Mountain bristlecone and limber pine individual-tree seed collections in Great Sand Dunes National Park and Preserve are concentrated near the WPBR infection areas and not directly associated with the plot networks. A sampling approach more typical for conservation programs has been adopted by Rocky Mountain and Great Basin National Parks where WPBR is thought to be currently absent. Individual-tree seed collections, and a bulked seed collection have been attempted from each of the 27 limber pine populations in and around Rocky Mountain National Park (Figure 2). Seed collections of Great Basin bristlecone pine began in 2011 in Great Basin National Park and more extensive collections are planned park-wide for both Great Basin bristlecone and limber pine.

In situ protection and conservation

Active protection of seed trees from mountain pine beetle and fire, when feasible, is ongoing. The seeds from these trees are used to test for genetic resistance to WPBR (see below); when resistance is found, additional seed is collected to build seed stocks for planting or seeding. These trees are an important component of the long-term conservation strategy. In Crater Lake National Park in recent years, mountain pine beetle has surpassed WPBR as the primary mortality agent of whitebark pine, and has killed several seed trees with genetic resistance to WPBR; mountain pine beetle has likewise caused extensive mortality of limber pine in Rocky Mountain National Park. In these parks, and Great Basin National Park, an anti-aggregate pheromone (verbenone) is used to repel mountain pine beetle, and provide *in situ* protection of the trees from which seed collections have been made. Additional mature limber pine trees are also protected from mountain pine beetle in Rocky Mountain National Park to help support natural regeneration, and a third group of limber pine trees is protected because they are highly valued by park visitors. The seed trees

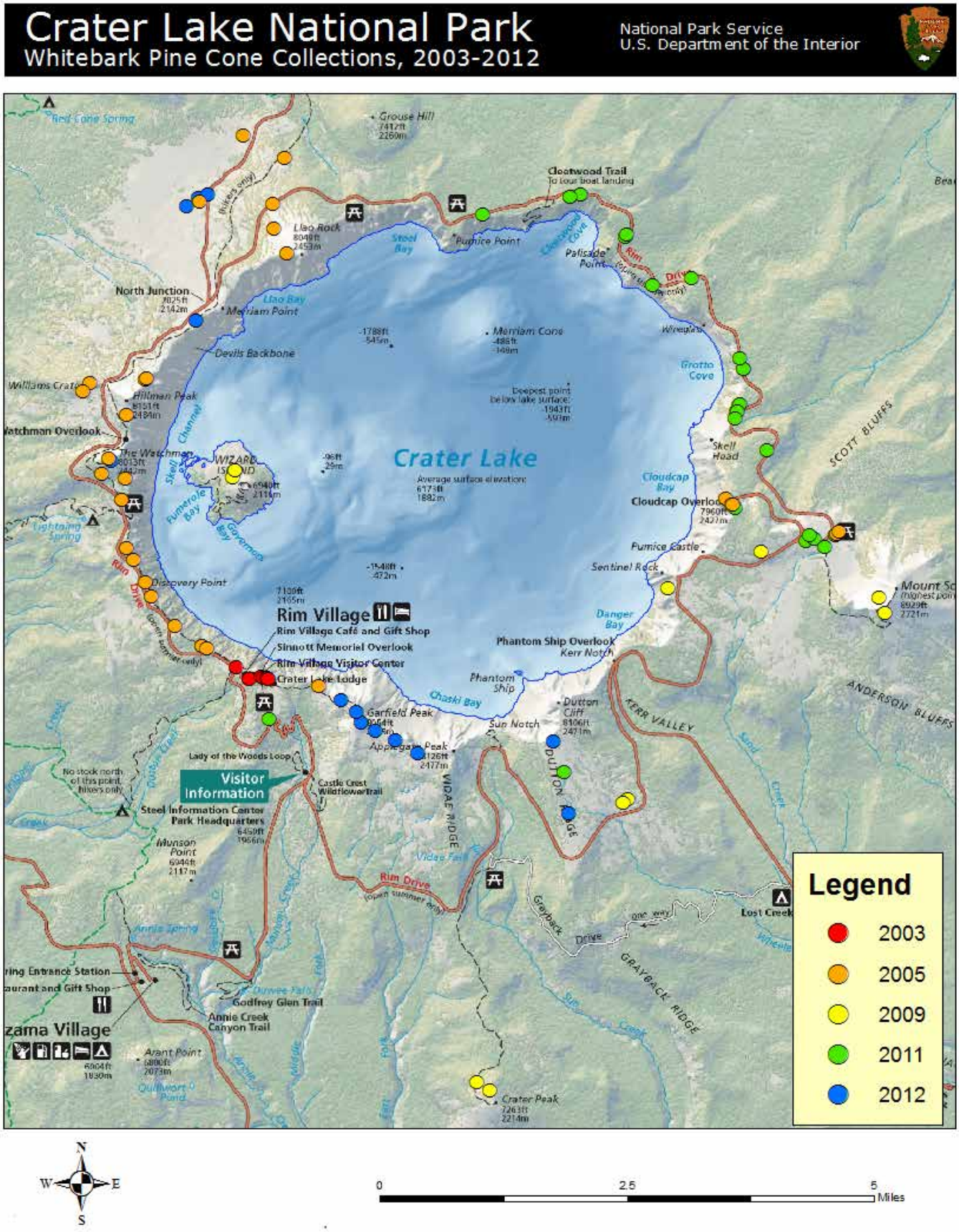

Figure 3. Whitebark pine seed tree locations in Crater Lake National Park by seed collection year.

are also listed as resources at risk for potential protection from wildfire; though some limber pine seed trees may have been recently lost in the 2012 Fern Lake Fire in Rocky Mountain National Park. Mountain pine beetle activity is low in Great Sand Dunes National Park and Preserve, so in situ protection of the seed trees has not yet been necessary.

WPBR resistance trials

Reducing the effect of disease on tree survival and fecundity, by increasing heritable disease resistance, is essential to sustaining many pine populations. WPBR resistance testing is a progeny test, requiring artificial inoculation of pine seedlings with *C. ribicola* in a nursery setting, followed by disease assessments. The testing process can take two to seven years, depending on the resistance mechanism being investigated. Several testing centers administered by the U.S. Forest Service operate in the western United States (Sniezko et al. 2011); the testing of the plant material from these parks is being conducted at Dorena Genetic Resource Center (Cottage Grove, OR). Past studies revealed disease resistance in each North American five-needle pine species, and current studies demonstrate an encouraging frequency of genetic resistance within national parks (Table 2).

Because the seed sources from Rocky Mountain National Park and Great Basin National Park were sampled without bias toward disease-free trees in the field (in areas with no WPBR present), these resistance trials provide estimates of the baseline frequencies of resistance in the native pine populations. Disease-resistance frequency and its geographic distribution provides valuable information for designing, prioritizing, and evaluating management options. Healthy populations in which resistance is present at moderate frequency can be seed sources for outplanting in similar habitats with less resistance, and can be managed to facilitate rust-resistance selection, and therefore accelerate the evolution of resistance throughout the population once WPBR invades (Schoettle and Sniezko 2007). A common garden study for limber pine was also conducted for Rocky Mountain National Park seed sources to identify genetic differentiation among populations and guide seed transfer decisions should outplanting or assisted migration be recommended.

Planting trials and natural regeneration dynamics

In populations with few or no WPBR-resistant parent trees, planting or direct-seeding resistant stock will be needed to sustain the community. In addition, planting may be recommended to increase the population size, if natural regeneration is sparse. Planting studies help define the techniques for high seedling survival, and can verify field expression of rust resistance identified in the WPBR resistance trials. Crater Lake National Park has installed four whitebark pine restoration plantings since 2009 (totaling 939 seedlings). Three years after planting, survival has been over 80%, and as high as 91%. Limber pine plantings at Great Sand Dunes National Park and Preserve have demonstrated over 70% survival, four years after planting (A.M. Casper et al., in preparation). These and other trials suggest that planting can be successful and feasible in these high-elevation habitats. Thus far, planting in Crater Lake and Great Sand Dunes National Parks has been outside of designated or proposed wilderness. Planting may be acceptable within wilderness, as it has been practiced with whitebark pine in Glacier National Park for the past 10 years. Rocky Mountain National Park is 95% wilderness, and a strategic plan that is being developed will help define appropriate actions for inside and outside wilderness.

For the high-elevation, five-needle pines, generation time is very long, and seedling establishment after disturbance is protracted. These species are tolerant of the stresses they evolved with, but are not well equipped, without additional regeneration opportunities, for rapid adaptation to novel stresses, such as WPBR in a changing climate (Field et al. 2012). A study conducted three decades after the stand-replacing Ouzel Fire of 1978 revealed high regeneration

capacity of limber pine in Rocky Mountain National Park (Coop and Schoettle 2009); geographic variation in regeneration among the limber pine study sites in and around Rocky Mountain National Park will add further information (J. Klutsch et al., in preparation). At Great Sand Dunes National Park and Preserve, seedling densities of limber pine and Rocky Mountain bristlecone pine are being assessed through repeat measurement of the established plot network (Figure 2).

Integration and application

Studies described here, and others, provide a science foundation from which conservation plans are currently being drafted for Crater Lake National Park (Beck and Holm 2013) and Rocky Mountain National Park National Park. The studies also provide knowledge pertinent to the greater geographic areas, and contribute to broader scientific understanding of these pine species, and to WPBR, and disturbance dynamics in these mountain ecosystems. Data from these studies are also being used to prioritize areas and treatments and align expectations for outcomes. This knowledge reduces the uncertainty in projecting outcomes of interventions or inactivity to improve trade-off analyses as managers assess their options; it can also feed into economic analyses as well (Bond et al. 2011). These programs may also provide conservation areas or refugia for the pines. Restoration treatments can slow impacts and rebuild impacted populations, and proactive interventions can help prepare the landscape for invasion to mitigate the severity of future impacts. Building a timely, solid science foundation assists in the careful consideration of the consistency of interventions, and consequences of no interventions, with park and wilderness policies and values as the ecosystems are challenged by non-native diseases or other factors. Through productive interagency collaborations and partnerships, each of these parks is using science to responsibly and creatively conserve and manage their resource for increased resilience to these novel, interacting stresses.

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24

Reconciling Competing Visions in New Deal Parks: Natural Conservation, Historic Preservation, and Recreational Development

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My central question is, why do parks look the way they do? It is a deceptively simple question that is really quite complicated. Take a park like Great Smoky Mountains National Park as an example. This park conjures images of mountains and wilderness. If you look beyond the surface, however, you find places like Elkmont Historic District, which challenge these assumptions and remind us that parks are cultural constructions. We make them and project our own cultural values onto the landscape.[1]

I find that there are three ingredients, so to speak, that are constantly in play in park development: natural conservation, historic preservation, and recreational development. I believe that the balance of these assets—sometimes contentious, sometimes parallel—shape how parks look, feel, and function. The thought park planners, managers, and boosters give to these decisions reflects their own values, and reveals how they believe parks should function in American society. The New Deal period is especially revealing, as the National Park Service (NPS) solidified its role as a national agency, and institutionalized the park "master plan." I have explored this issue on the park level through several case studies, which contribute to my thesis that New Deal park planners struggled to reconcile these assets, and this conflict greatly transformed state and national park landscapes.

The New Deal period is essential to understanding park development. The NPS became a true national agency during this time by expanding east of the Mississippi River to reach the majority of the US population. A 1933 executive order transferred all the battlefields and a number of monuments from the War Department and US Forest Service to NPS. New Deal relief programs, such as the Civilian Conservation Corps (CCC) and Works Progress Administration (WPA), funded the creation of hundreds of new parks and entire state park systems, such as that of Texas. The rapidity of this expansion solidified the importance of park planning, in which a multi-disciplinary team of specialists gathered baseline data prior to any development. NPS developed new kinds of professionals that shaped visions for parks, including historians, historical architects,

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and archaeologists who worked with traditional NPS employees, such as landscape architects, engineers, and naturalists. Additionally, NPS planners created new types of parks to diversify the system, including national recreational demonstration areas and parkways. These new types of parks took the agency further away from its traditional affiliation with great western scenic parks.[2]

The public has associated NPS with being a safeguard for America's natural areas, particularly western scenic parks, since the agency's inception. However, NPS has dramatically changed its management of natural resources since the passage of the Organic Act in 1916. Initially, NPS managers believed in preservation through development, or sustaining use of a space through careful use. They were concerned with maintaining the visual aesthetics of nature, not ecological integrity, in order to attract visitors. They wanted to keep the landscape looking "natural" and conservationists did not have a problem manipulating the environment to achieve that goal. During this time, wilderness areas were simply considered roadless, natural areas. In general, roads were okay in parks, as long as they harmonized with their natural surroundings. Additionally, NPS allowed the eradication of predatory animals, while preserving more popular species, and stocking water sources for fishing.[3]

During the 1930s, NPS entered fully into the business of historic preservation and remains a leader today. Verne Chatelain became the first chief of the new History Division in 1931. Two years later, NPS received all the battlefields from the War Department. That same year, Congress created the Historic American Building Survey (HABS) as a New Deal program to fund unemployed architects and photographers. The Historic Sites Act of 1935 ordered NPS to undertake a national survey of historic sites and develop thematic studies. Archaeologists undertook excavations on an unprecedented scale in national parks, and these projects became the basis for the new field of historical archaeology. Chatelain instructed that historical research must precede any type of development work. Therefore, historians, historical architects, and archaeologists became integral parts of planning efforts.[4]

During this time, park planners reconciled nature and history by blending them together. They usually singled out historic sites to develop into day-use areas. They loved the idea of freezing sites in time by taking them back to a period of significance. This technique holds a powerful appeal but is fraught with problems and ignores change over time. They were also very interested in preserving sites that conveyed ideas of primitiveness and humans conquering nature. In fact, park planners loved the concept of the "frontier village," and had the tendency to "naturalize" these sites even further. Cades Cove in the Great Smoky Mountains is a great example. HABS architects recorded structures, but focused mainly on log structures, and largely ignored frame buildings that appeared more modern. Workers restored a select number of log and frame structures and removed others. They also restored a mill and built a tour road; both are still used by visitors today. However, park planners paid little attention to the historic agricultural landscape, and created an illogical landscape.[5]

I have reconsidered the term "recreational development" in favor of a broader concept, "human conservation," that allows us to look at parks as reform landscapes. The New Deal made apparent, more than any other time, the potential of park recreation as a measure of social reform. Park planners addressed this in three different ways. First, they intended park recreation to rejuvenate the urban masses, build individual character, promote nationalism and consumerism, and show proper conservation techniques through "demonstration areas." Park planners established Catoctin Mountain Park during the New Deal as a recreational demonstration area with several organized campgrounds. The first organized camp was specifically designed for the Maryland League of Crippled Children. Last summer, the league celebrated its seventy-fifth anniversary at Camp Greentop. Park planners envisioned another camp that was never constructed because the park expended its New Deal funds. It was a segregated camp specifically for African Americans.[6]

Second, New Deal relief programs put thousands of people to work in state and national parks, physically transforming the landscape. These projects also transformed the workers themselves by instilling life skills and giving them job training. The CCC is the clearest example. The government created a program specifically for young men to perform manual labor in mostly remote, rural areas away from the sins and vice of cities. They lived in camps managed by the War Department where they received room, board, education, and vocational instruction. This program not only offered young men temporary relief in the Great Depression, but trained them to be better citizen-consumers.[7]

Finally, human conservation programs in parks transformed the lives of those whose land was acquired to create these places. Some reformers linked land degradation to poverty. Often, reformers believed people who lived on "submarginal" land were really getting a golden ticket out of rural poverty when the federal government offered to purchase their land. Historian Sara Gregg shows that park planners at Shenandoah National Park removed some residents directly to resettlement communities outside the park. New Deal reformers intended these resettlement communities to improve the quality of life of those who subsisted on submarginal land.[8]

These ideas play out differently at every park, and this paper provides two case studies to show this interplay between natural conservation, historic preservation, and human conservation.

Case study 1: Chesapeake and Ohio Canal National Historical Park

The federal government purchased the C&O Canal in 1938 for the bargain price of $2 million, primarily for its proximity to urban populations in Washington, D.C., and Baltimore, Maryland. The canal is 184.5 miles long, and follows the Potomac River from Georgetown to Cumberland, Maryland. The canal offers terrific scenic views, and has a very rich history and tremendous recreational potential.[9]

Park planners did not know initially what to do with the canal, but needed to put unemployed people to work immediately. This park did not have a 1930s master plan, which reflects the haste and urgency of New Deal relief programs. NPS committed two African American CCC companies and Public Works Administration (PWA) workers to re-water the first 22 miles of the canal. The workers preserved the historic lock houses in this area and developed historic Great Falls Tavern into a day-use area. NPS planners and New Deal workers restored the tavern back to its period of significance. NPS used historians and HABS architects to research the cultural resources prior to development. This section of the canal is an excellent example of how park planners managed to blend nature and history together, but still put recreation and human conservation at the forefront.[10]

However, NPS made another important precedent when in fact they did not do anything with the remaining 164 miles of the canal and allowed nature to reclaim this portion of the canal by default. NPS considered making this a parkway but a grassroots movement in the 1950s demanded that it be preserved. Today, the C&O Canal is two very different parks. The first twenty-two miles remains re-watered while the rest lay in ruins. It is up to the four million visitors that recreate in the park every year to decide which version of the canal they prefer better. However, neither section resembles anything like the canal's historical appearance, which reminds us that C&O Canal "the park" is a cultural construction. It owes much of its identity to that initial New Deal period.[11]

Case study 2: Cumberland Gap National Historical Park

I believe that park planners and managers continue to deal with the legacies of the New Deal, which they recast to meet changing needs. I decided to expand my study, up through the Great Society, to continue charting how park planners, managers, and boosters deal with natural conservation,

historic preservation, and human conservation. The Great Society is generally defined as the set of domestic policies developed by President Lyndon B. Johnson's administration from 1964 to 1969, which included significant antipoverty and environmental legislation that had a tremendous impact on parks. This has led me to my current case study on Cumberland Gap National Historical Park.

NPS conceived of Cumberland Gap late in the New Deal, but the park came of age in the late 1950s. It is a bridge between the conservation and environmental eras. It is also a historical park that commemorates westward expansion through a natural feature—the gap. The park encompasses land in Tennessee, Kentucky, and Virginia. The Department of Interior dedicated the park in 1959 and constructed basic park infrastructure with Mission 66 funding.[12] Shortly after, Congress passed the Economic Opportunity and Wilderness acts in 1964, and the National Historical Preservation Act in 1966. The War on Poverty came to Appalachia and so did wilderness and preservation advocates. A new discourse emerged at Cumberland Gap.

First, the Office of Economic Opportunity placed a Job Corps Conservation Center at Cumberland Gap, which is the Great Society version of the CCC. Unlike the CCC, the Job Corps conservation program was a political failure and is not as well known or commemorated. However, during its short existence, enrollees, much like their CCC predecessors, continued to transform the park landscape, and transform themselves during this age of liberal idealism.[13]

Park managers held wilderness hearings after the passage of the Wilderness Act, which asked NPS units to evaluate roadless areas over 5,000 acres. These hearings are an interesting view into the environmental movement and the pressure for ecological integrity in national parks because they opened park planning to public scrutiny. The hearings show that the public was interested in expanding the wilderness areas in Cumberland Gap beyond what NPS had envisioned. Wilderness advocates also strongly opposed the proposed Allegheny Parkway, which they feared would degrade the park's wilderness areas. Ironically, the public also advocated the preservation of Hensley settlement as a primitive frontier village, even though it was a twentieth-century community. These discussions of wilderness and roads also prompted NPS planners to tunnel US Highway 25 underneath the gap to return the feature back to its late eighteenth-century appearance.[14]

Understanding the interplay between natural conservation, historic preservation, and recreational development helps us decode the landscape and understand the cultural values it embodies. It helps us chart important debates in state and national parks that are still discussed today, including the issue of roads in parks, the concept of wilderness, and managing cultural resources in wilderness areas. Further, it forces us to be self-reflective about what kind of visions park planners, managers, and boosters are driving forward today.

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Connecting Urban Populations to Protected Areas

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Introduction

Creating this Canadian first, a national urban park in Toronto's Rouge River Valley, is an exciting initiative. In keeping with Parks Canada's mandate, this project is well aligned with Parks Canada's goal to reach Canada's increasingly diverse urban population. Success of this initiative would not be possible without the dedication and foresight of those in the community and in government who have worked nearly thirty years to protect and care for this special place.

The challenge

As policy makers and managers of protected places, we face a number of common challenges. Our countries are becoming increasingly urban, and our traditional visitor base is eroding. In Canada, 80 percent of our citizens live in cities (Statistics Canada). Not surprisingly, the numbers are even greater for new Canadians. In the greater Toronto area, the pace of growth is staggering. In 2011 the population of this area was 6.3 million; by 2036 it is expected to grow to 9.2 million (Ontario Ministry of Finance 2013). Until now, Parks Canada has had no on-going presence in the greater Toronto area, where 20 percent of the Canadian population lives.

One in five Canadians is born outside of Canada, and this ratio is expected to increase to one in three within the next few years. Unlike many of us who grew up camping and hiking, many new Canadians did not start out with these same connections to landscape. This changing relationship to nature is also seen among youth, particularly urban youth, who spend more time indoors than out, and who are especially disconnected from nature and agricultural areas.

The competition for Canadian's leisure time is fierce, and our protected area messages, if and when we send them, are often lost in the clutter. Parks Canada depends on only 18 percent of the Canadian population for its visitation, and draws more visitors from town and rural areas than from urban and suburban areas. Our protected places are mostly located far from urban areas. It's no wonder that, despite some increasing awareness, our visitation continues to decrease.

The case for change

"Until we create the case for change and for people to understand why [connecting Canadians

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to nature] is critical, we will not achieve what we want to achieve in terms of societal change and political support long term" (Alan Latourelle, CEO, Parks Canada). As expressed by our CEO, connecting Canadians to nature is a critical and urgent societal issue. Are we prepared to tackle the challenge?

A call to action

At Parks Canada we believe the time to act is now. We've aligned our agency vision, our formal commitment to performance (known as our strategic outcome), and one of our corporate priorities to this end. Our agency vision is that Canada's treasured natural and historic places will be a living legacy, connecting hearts and minds to a stronger, deeper understanding of the very essence of Canada. Our strategic outcome is that Canadians have a strong sense of connection, through meaningful experiences, to their national parks, national historic sites, and national marine conservation areas, and that these protected places are enjoyed in ways that leave them unimpaired for present and future generations. A corporate priority is that Parks Canada will undertake activities to connect and interact with new Canadians, youth, and young adults in Canada's largest cities by working with partners and supporters, and by employing channels such as mass media and social media. A number of actions will focus on raising awareness and increasing connection with audiences in Toronto, Montreal, and Vancouver.

The opportunity

We have many things working in our favor. Torontonians are craving green space, and while they make use of their neighborhood parks, they want access to larger natural areas. New Canadians want to understand and know their new country, especially after they've satisfied more basic needs of housing, employment, and schooling.

Fast growing municipalities need natural areas to address social challenges, and to enrich the lives and improve the health of their residents. Young people need and want leisure alternatives. Agencies and associations realize they can't succeed alone, and are open to the possibilities of partnering. And if there's one common thread seen throughout the country: families, no matter their cultural background, want to recreate, gather, and spend time together.

Canada's first national urban park

Enter Canada's first national urban park, a new entity for Parks Canada that will take its place alongside national parks, national historic sites, and national marine conservation areas. The local stakeholders in the greater Toronto area and the provincial and municipal governments recognized they had taken their conservation efforts to protect and manage the Rouge as far as they could, under the now disbanded Rouge Park Alliance. They asked the federal government to join and lead the effort to create a larger park, reflective of its urban setting, worthy of national profile, and protected by national designation and legislation. The government of Canada responded positively, and announced funding on 25 May 2012. Parks Canada will eventually become the landholder and manager of the Rouge National Urban Park. The agency sees an unparalleled opportunity to achieve its objectives to connect with Canadians, and to combine its expertise with communities, stakeholders, First Nations and other levels of government.

Location and size

Where exactly is the Rouge? It's in the Province of Ontario, in the eastern portion of the greater Toronto area. The future national urban park will occupy an area of approximately 60 square kilometers, representing an increase of 20 percent above the current size of the provincially and municipally-run park.

The Rouge and its features—lower river habitats, lakeshore marshes, Carolinian forest, ravines, agricultural farmland, and adjacent uplands—combine to form the largest system of connected areas along any of the river valleys draining into Lake Ontario. The park has a diverse natural landscape, which is home to 760 plant species, 225 bird species, 55 species of fish, 27 mammal species, and 9 species of reptiles and amphibians. Humans have been living in and using this area for over 10,000 years.

Vision

A people's park: Rouge National Urban Park celebrates and protects, for current and future generations, a diverse landscape in Canada's largest metropolitan area. Linking Lake Ontario with the Oak Ridges Moraine, the park offers engaging and varied experiences, inspires personal connections to its natural beauty and rich history, promotes a vibrant farming community, and encourages visitors to discover Canada's treasured places.

The existing Rouge Park was born out of a history of community activism, and there exists today a wealth of visionaries, stewards, and story tellers. The concept of a 'People's Park' is the underlying idea in the park vision. Building and maintaining a meaningful relationship with First Nations, stakeholders, and community residents are key to realizing the vision. Natural and cultural resources will be protected, the wonderful stories of conservation and stewardship will be told, and visitors will share their own experiences and stories. Rouge National Urban Park will also be a place to discover other treasured places in our country.

Figure 1. Rouge Park has many historic structures. Photo courtesy of Rouge Park.

Figure 2. Lake Ontario's beaches draw families to the park. Photo courtesy of Rouge Park.

An integrated approach

We could not have the possibility of a protected area such as Rouge National Urban Park anywhere else. As such, we need an innovative concept and approach which reflects the park's urban setting. In all of Parks Canada's protected places, Parks Canada seeks to integrate delivery of the three elements of its mandate: protection, education, and visitor experience.

In Rouge National Urban Park four main goals will be integrated:

- Conserving natural heritage;
- Celebrating cultural heritage character;
- Supporting a vibrant farming community; and
- Connecting people to nature and history.

Conserving natural heritage

Our approach to conservation will be tailored to the needs of the terrestrial and aquatic ecosystems. We will work to enhance diversity, and improve habitat quality and connectivity. These are several species at risk, and these will be protected. We will be effective, efficient, and engaging in our efforts. We will combine our expertise with best practices from around the world.

Celebrating cultural heritage character

For thousands of years, First Nations travelled through and used this area. There are the archeological remains of a seventeenth century Seneca Village, recognized today as a national histor-

Figure 3. The park's nature trails provide outdoor opportunities to residents of the greater Toronto area. Photo courtesy of Rouge Park.

ic site. Settlers from the United States of America came here 200 years ago and still farm the land today.

We have established a dialogue with ten First Nations who will come together as an advisory circle for the future national urban park. Discovering and learning about the rich heritage of the Rouge Valley is essential to understanding the importance of the landscape. Celebrating this heritage is therefore one of our four main goals.

Supporting farming heritage

There are 75 farms currently in the Rouge, and many of these are working farms. The farms here grow and supply food for the greater Toronto area. There is a mix of private and leased farms. Parks Canada will eventually become a landlord here, and will encourage sustainable farming practices. We will also work with farmers to provide a stable environment so they can make a living, and the farmers will work to support educational programs and park conservation efforts.

Connecting people to nature and history

As a 'People's Park' we will provide varied opportunities for people to enjoy and experience the park. Programs will be designed to inspire, engage, and build stewardship. Facilities will be clustered, and a connected trail network will form the backbone of the park. Rouge National Urban Park will be a gateway to nature and protected places, and a window on Parks Canada and the other members of our family. Entry will be free, and the park will be accessible by public transit.

Park planning and public engagement

Public engagement is integral to the process of moving from announcing the creation of Rouge National Urban Park, to the park's first strategic management plan. The process involves three phases of ongoing public engagement. Input during the various phases contributes to the development of two documents: first, the park concept; then, the park strategic management plan.

The first phase of engagement occurred between June 2011 and May 2012, and involved more than 100 national, provincial, and municipal organizations, Aboriginal partners, youth, and individuals and organizations with expertise related to conservation, farming, tourism, recreation, youth, and education. In autumn 2011, Parks Canada initiated a distinct engagement process with interested First Nations to share information and begin dialogue about their future engagement in the planning, establishment, and presentation of the national urban park.

From June 25 to October 8, 2012, a variety of methods were employed to engage diverse audiences, and seek input on the park concept. The Parks Canada website featured information on the proposed Rouge National Urban Park concept, as well as an online survey that served as the primary means for people to submit their views. The survey was promoted though periodic newsletters, Twitter, community events, meetings, email, and print distribution.

Postcards containing the survey website address and a QR code, enabling smart phone users to complete the survey, were distributed to more than 8,500 people. Several organizations and

local groups requested postcards, newsletters, and factsheets for distribution to their respective members. A Rouge Park email address was also established to solicit comments. A one-page factsheet was mailed to more than 26,000 households, apartments, and farms in and around the proposed park boundary in an effort to solicit input.

Other means of engagement included three public information sessions, three stakeholder meetings, attendance at 15 community events, and three weeks on Yonge Street during the Toronto Film Festival. A Parks Canada engagement kiosk was set up at each event to provide an opportunity for people to interact with Parks Canada staff, and to fill out the survey on site. Informational materials in the kiosk included factsheets, the Rouge National Urban Park Concept, and postcards. Event participants included seniors, youth, new Canadians, urban residents, farmers, and other communities of interest.

The feedback received during the summer 2012 engagement program will help shape the development of the strategic management plan, which is the next step in the planning process for Rouge National Urban Park. Once in draft form, the strategic management plan will be shared for public comment, in a third phase of public engagement. The strategic management plan will provide the overarching guidance for the management of Canada's first national urban park. Premised on accountability, inclusiveness, and collaboration, the strategic management plan will outline an integrated delivery of Parks Canada's mandate for protection, education, and visitor experience. It will also provide a framework for decision making and tactical implementation, thus ensuring the effective use of public funds.

The strategic management plan will describe the park's approach to area management, visitor arrival and orientation, and the park's trail system. The plan will include strategies for natural and cultural resource conservation, visitor experience, external relations, education, sustainable agriculture, and collaboration with partners. The strategic management plan will also identify an inclusive governance structure that ensures a diversity of input into park management decisions, including continued First Nation involvement. The plan will describe desired ten-year outcomes for the park, and how goal achievement will be measured.

Early thinking

The strategic management plan's ten-year horizon requires an adaptive management approach to deal with a rapidly changing external environment. Access to and within the park is critical, particularly the location of arrival areas and their connection to neighboring communities and public transit. A broad approach to conservation and restoration is required; watershed objectives and aquatic ecosystem needs must be addressed. All park areas must demonstrate an integrated approach to conservation, learning, agriculture, and visitor experience. Actions to improve agricultural sustainability require careful phasing. Partners will play a significant role in terms of programming, and traditional and non-traditional delivery of services.

Sample strategies

The strategic management plan for Rouge National Urban Park will contain key strategies and actions. Some being considered include the following:

- Reach greater Toronto area residents in their neighborhoods, especially Chinese and South Asian communities living near the park.
- Target Canada's "young metro" and "family traditions" neighborhood segments (PrizmC2).
- Engage youth through creative programming and social media.
- Work collaboratively with intermediaries and academic institutions.
- Invest in park access, arrival, and connectivity.

- Have First Nations, farmers, and artists tell their own stories of connection to the park.
- Continue to foster the area's long tradition of volunteering.
- Deliver visitor services predominantly through partnerships, alliances, and non-traditional means.

Closing

Once established, Rouge National Urban Park will achieve the following:

- Take its place as the fourth member of the Parks Canada family (along with national parks, national historic sites, and national marine conservation areas).
- Inspire, inform, enrich, and engage the urban spirit in a celebration of protected nature, culture, recreation, and discovery.
- Be a window on Parks Canada, and a place to showcase protected places through the respected Parks Canada system.

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The International Ranger Federation: Uniting Rangers to Protect the World's Treasures

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The International Ranger Federation (IRF) links more than 60 ranger associations representing countries and states around the world. Started in 1992 by a small group of rangers, the IRF supports field-level staff at parks and protected areas by fostering professional development, organizing training sessions, developing standards, supporting rangers in danger, and hosting World Ranger Congresses every three years. The IRF encourages countries to form their own ranger associations, and then to become part of the world community of rangers by affiliating with the IRF.

What is a ranger?

- A guardian of protected areas;
- A custodian of cultural sites and stories;
- A defender of wildlife; and
- A teacher and interpreter connecting people with special places and inspiring environmental sustainability.

Rangers provide "frontline" protection and, in doing so, often face a variety of risks, including the following:

- The bullet of a wildlife poacher;
- Attacks from the animals they are trying to protect;
- Natural disasters, including wildfire and flood;
- Crime against park visitors or park facilities; and
- Search and rescue operations under extreme weather conditions or in dangerous locations.

Ranger training is a way to build for the future—for environmental protection, for community well-being, and for ranger safety. The IRF works with like-minded organizations to provide training, including the PAMS Foundation (Africa), Equipe de Conservação da Amazônia (Brazil), and EUROPARC Federation (Europe). Training develops skills in eight key areas:

1. Ecology and conservation, to monitor changes in the landscape and take appropriate conservation action;

Citation: Weber, Samantha, ed. 2014. *Protected Areas in a Changing World: Proceedings of the 2013 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites*. Hancock, Michigan: George Wright Society.

2. Resource protection, to enforce existing laws and regulations appropriately and safely;
3. Interpretation, education, and information, to communicate effectively to a wide range of people using a wide range of methods;
4. Building relationships with communities and other stakeholders, to show political, social, and cultural sensitivity and involve communities in managing protected areas;
5. Technology and infrastructure maintenance, to maintain and safely utilize infrastructure and equipment;
6. Emergency response, to respond safely to incidents such as vehicle accidents, lost or injured visitors, wildfire, and environmental disasters;
7. Project management and operational planning, to manage budgets and projects, including preparation, monitoring, evaluating, and reviewing; and
8. Workplace communication and relations, to operate effectively as a member of a team.

Want to get involved?

- Visit the IRF website and learn about our many projects and partners.
- Set up a ranger association and join the IRF. The IRF and its partner association, the Thin Green Line Foundation, can assist.
- Help prevent ranger deaths. Assist the IRF to "protect the protector" by joining forums to share information on lessons learned about training, legislation, and avoiding violence to rangers.
- Ensure the rangers you employ are well-supported, well-equipped, and well-trained.
- Participate in the development of training standards.

To find out more, you can visit www.internationalrangers.org, or send an email to irfmailings@gmail.com.

> The future of our ecosystem services and our heritage depends on park rangers … they are the backbone of park management. They are on the ground. They work on the frontline with scientists, visitors, and members of local communities.
>
> *— Kenton Miller, IUCN*

> Well trained rangers are critical to healthy ecosystems and healthy communities.
>
> *— Deanne Adams, IRF president, 2009–2012*

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National Parks and Landscape Conservation

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The mission of the National Parks Conservation Association (NPCA) is to protect and enhance America's national parks for present and future generations. National park landscape conservation includes an evolving role for partners, described by the 2008 National Parks Second Century Commission. "We must extend the benefits of the national park idea in society by creating new national parks, collaborative models, and corridors of conservation and stewardship, expanding the park system to foster ecosystem and cultural connectivity." The next year, the Department of the Interior issued secretarial order 3289, declaring that bureaus and agencies must work together, with other federal, state, tribal, and local governments, and with private landowner partners to develop landscape-level strategies for understanding and responding to climate change impacts.

In April 2010 President Obama announced the America's Great Outdoors initiative, which recognizes that to protect ecosystems, watersheds, and wildlife, conservation must take place across large landscapes. This requires collaboration among landowners, public land agencies, and local communities. Large landscape conservation supports healthy ecosystems and cultural resources. In 2011, the National Park Service (NPS) announced the Call to Action, and that the NPS will protect continuous corridors in five geographic regions through voluntary partnerships across public and private lands.

In 2012, the NPS produced the Revisiting Leopold: Resource Stewardship in the National Parks report which stated that, "the NPS should … manage the National Park System as the core of a national conservation network of connected lands and waters … engaging networks, collaborations … and partnerships." This report explained that, "while individual parks can be considered distinct units, they are … embedded in larger regional and continental landscapes influenced by adjacent land and water uses and regional cultures.… Connectivity across these broader land- and seascapes is essential for system resilience over time to support animal movements, gene flow, and response to cycles of natural disturbance."

Park partners help advance landscape conservation in the following ways:

- Protect national park landscapes from external development threats, fragmentation, and the effects of climate change, using advocacy and litigation.

Citation: Weber, Samantha, ed. 2014. *Protected Areas in a Changing World: Proceedings of the 2013 George Wright Society Conference on Parks, Protected Areas, and Cultural Sites*. Hancock, Michigan: George Wright Society.

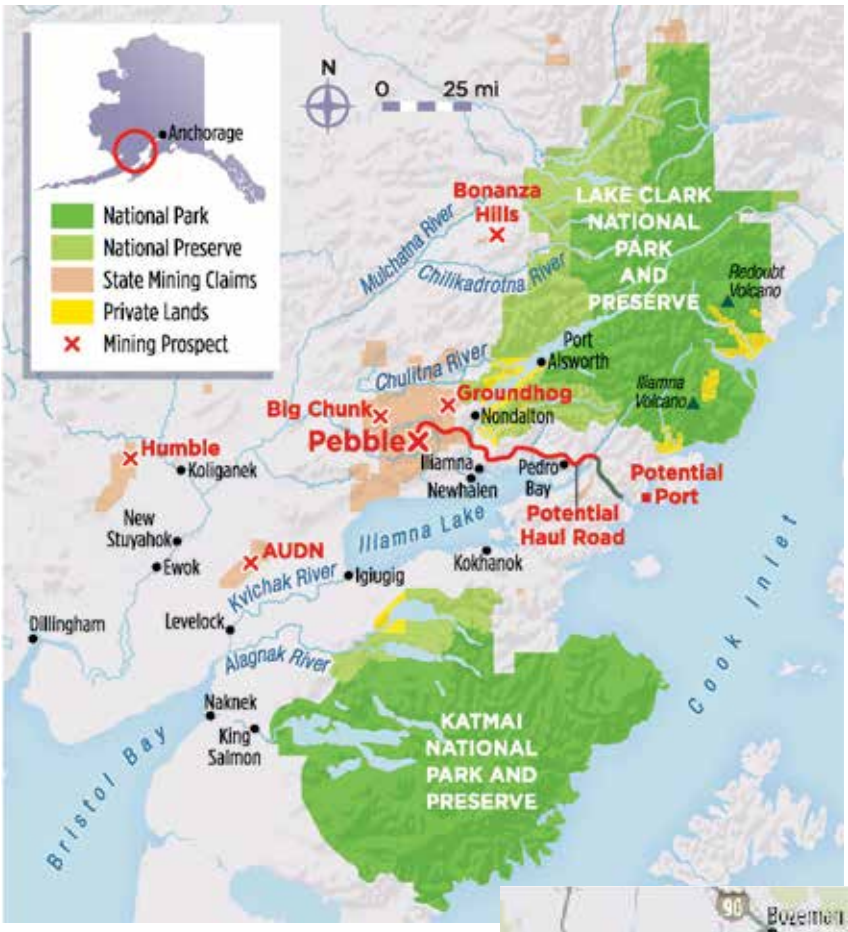

Figure 1. Proposed mines are a major threat to the pristine waters surrounding and flowing through national parks in Alaska.

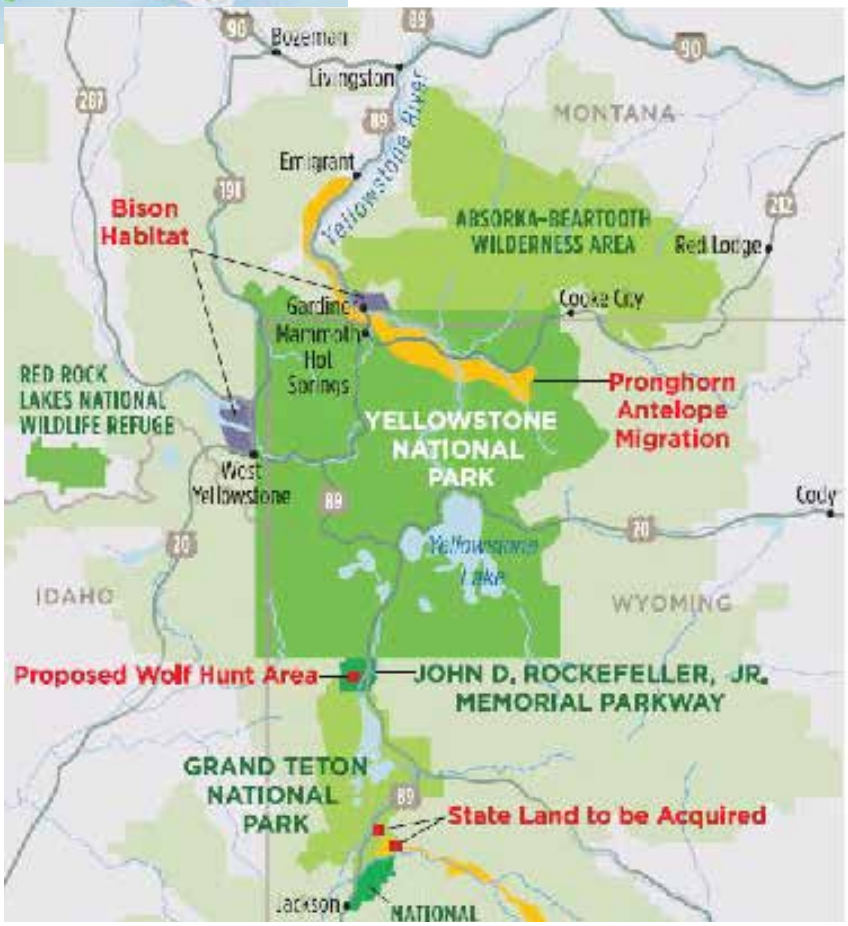

Figure 2. To remain healthy, pronghorn antelope need free access to habitat beyond the borders of protected parks.

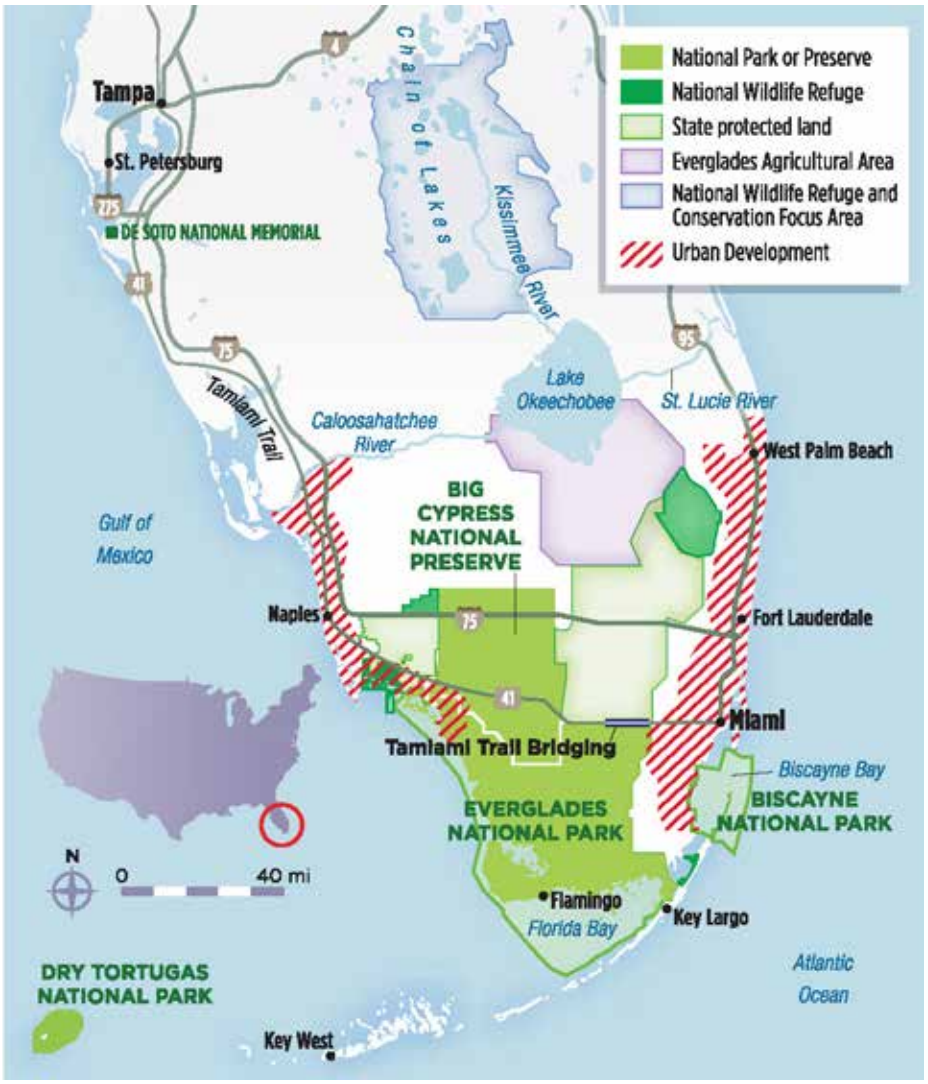

Figure 3. Restoring water flow is essential to restoring the health of Everglades National Park.

- Connect park lands by working with landowners, land managers, and decision makers to establish corridors.
- Restore lands and waters that surround and run through parks by building consensus and advocating for funding.

Protect

Lake Clark National Park and Preserve protects the watershed necessary for the perpetuation of the sockeye salmon fishery in Bristol Bay (Figure 1). Every summer over 50 million wild salmon surge across Bristol Bay's rivers and lakes. Over 500,000 acres next to Lake Clark have been staked with mining claims. An Environmental Protection Agency risk assessment says mining could harm water quality, critical habitat, and fishing. NPCA works with tribes, wildlife and park advocates, tourism businesses, and the fishing industry to oppose destructive mining.

Connect

The Greater Yellowstone Ecosystem stretches across 20 million acres of Wyoming, Montana, and Idaho (Figure 2). Pronghorn antelope in both Yellowstone and Grand Teton national parks participate in rare long-distance migrations to find snow-free winter habitat. Fencing and development near park boundaries isolate pronghorn, leaving them at risk for disease, harsh winters, and harassment from predators. NPCA organizes on-the-ground projects, like reconnecting pronghorn habitat by removing fences that block pronghorn seasonal migration.

Restore

Everglades National Park encompasses the largest subtropical wilderness in the United States of America (Figure 3). Ecological improvements are critical, and decisive action must be taken to restore clean water flows. NPCA leads a coalition that advocates for the federal Comprehensive Everglades Restoration Plan. This multi-billion-dollar collaboration between state and federal agencies includes more than 60 projects to restore the landscape.

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