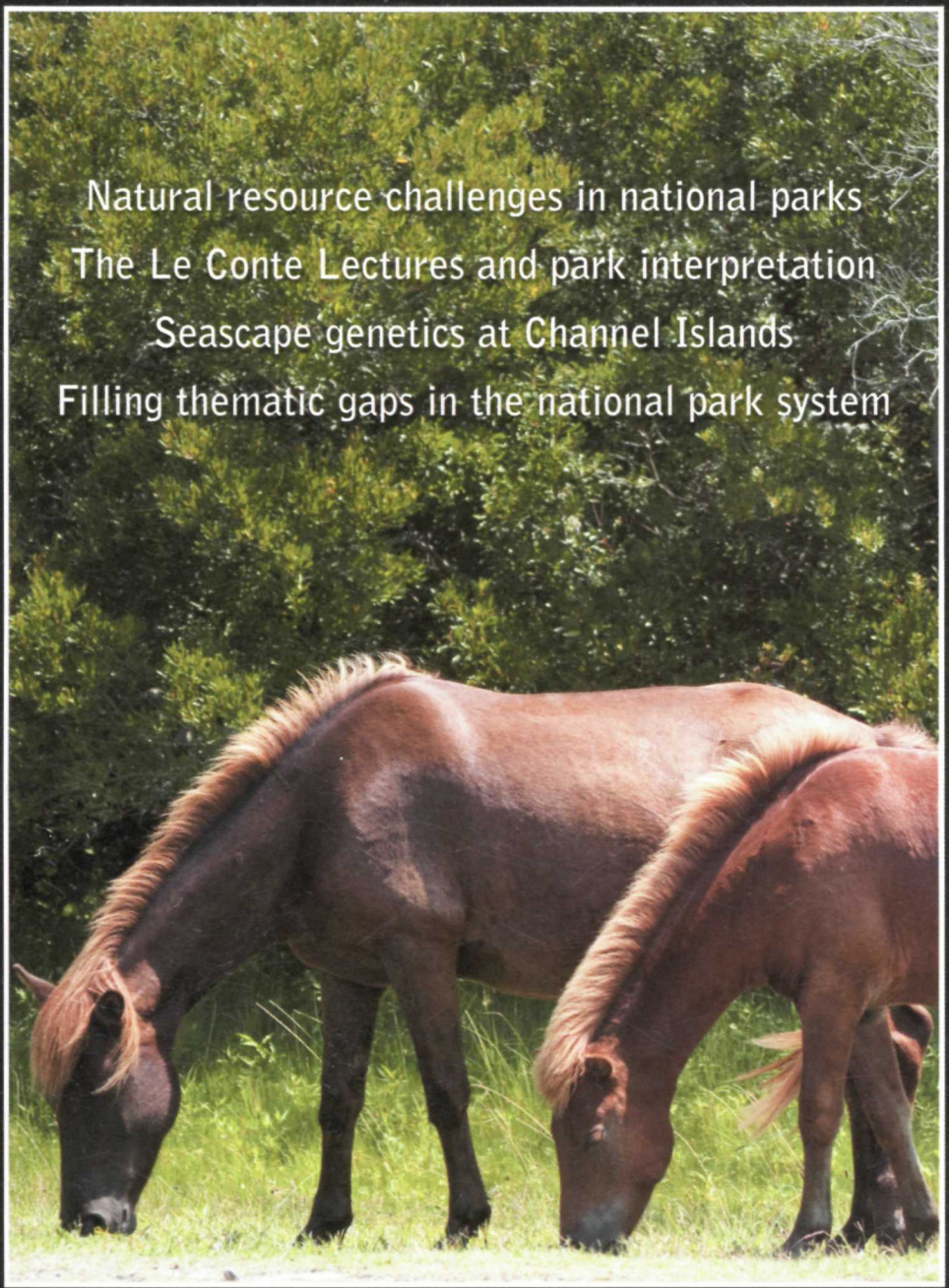


The George Wright Forum

The GWS Journal of Parks, Protected Areas & Cultural Sites

volume 27 number 3 • 2010

Origins

Founded in 1980, the George Wright Society is organized for the purposes of promoting the application of knowledge, fostering communication, improving resource management, and providing information to improve public understanding and appreciation of the basic purposes of natural and cultural parks and equivalent reserves. The Society is dedicated to the protection, preservation, and management of cultural and natural parks and reserves through research and education.

Mission

The George Wright Society advances the scientific and heritage values of parks and protected areas. The Society promotes professional research and resource stewardship across natural and cultural disciplines, provides avenues of communication, and encourages public policies that embrace these values.

Our Goal

The Society strives to be the premier organization connecting people, places, knowledge, and ideas to foster excellence in natural and cultural resource management, research, protection, and interpretation in parks and equivalent reserves.

Executive Office

DAVID HARMON, **Executive Director**
EMILY DEKKER-FIALA, **Conference Coordinator**
P. O. Box 65 • Hancock, Michigan 49930-0065 USA
1-906-487-9722 • info@georgewright.org • www.georgewright.org

ISSN 0732-4715

The George Wright Society is a member of US/ICOMOS (International Council on Monuments and Sites—U.S. Committee) and IUCN, the International Union for the Conservation of Nature.

The George Wright Forum

The GWS Journal of Parks, Protected Areas & Cultural Sites

volume 27 number 3 • 2010

On the cover: Feral horses are a big visitor attraction at Assateague Island National Seashore, but a National Parks Conservation Association analysis of natural resource challenges in national parks points out that they also graze and trample native plant communities. See the article by Gail Dethloff in this issue. Photo courtesy of Bill Smith III via Wikipedia Commons.

March 14–18, 2011 • New Orleans, Louisiana

Cutting-edge research • The latest management techniques • Critical reflection on the future of parks Camaraderie in the incomparable city of New Orleans

GWS2011 IS ALL THIS AND MORE ... YOU DON'T WANT TO MISS IT! REGISTER TODAY!

www.georgewright.org/gws2011

New Orleans has been called "the northernmost Caribbean city in the world." And in many ways, it is—full of insouciant flair, unique cultural traditions, vibrant music and the arts, and, of course, incredible cuisine. There is simply no place like it anywhere.

And it's the location of the next edition of the USA's premier professional meeting on parks, protected areas, and cultural sites: the 2011 George Wright Society Conference. We're meeting March 14-18 at the Sheraton New Orleans, right next door to the world-famous French Quarter. The GWS2011 program is bursting with more than 200 sessions on everything from climate change to cultural landscapes to visitor management. If it's important to the world of parks, protected areas, and cultural sites, we're going to be talking about it in New Orleans!

And, as always, we have a great variety of field trips and special events such as our signature GWS/NPS Awards Banquet to choose from. And for GWS2011 we are offering several service projects—unique opportunities to get out into New Orleans and assist in important projects that have been proposed by community members.

Register today! We look forward to having you join us in the exciting city of New Orleans!

The GWS Capacity-Building Campaign
Honor Roll of Giving through November 2010

As the GWS turned 30 this year, our Board of Directors began planning a renewed effort to put the Society on a sustainable financial footing for the long term. As a first step, we launched an appeal to Life Members to help us build our capacity for grant-seeking and other development activities. By the time you read this, the appeal will have been sent to most other members as well. As part of the appeal, we established a set of Leadership Circles for donors: the **Patrons' Circle** for donations of $10,000 and above, the **Benefactors' Circle** for donations of $5,000 or more, and the **Leaders' Circle** for donations of $1,000 or more.

Here, we recognize and sincerely thank the intial donors—the trail blazers of this effort. These are people who care deeply about the future of the George Wright Society. We hope to be able to add your name to the Honor Roll of Giving too.

Patrons' Circle

Pamela W. Lloyd & James Lloyd

Benefactors' Circle

Frank Priznar

Leaders' Circle

Thomas Cobb
Rebecca Conard
Dennis B. Fenn
Rolf Diamant & Nora Mitchell
Abigail Miller in memory of Robert Miller
Rick Potts
Molly Ross
Richard W. Sellars & Judith Sellars

Donors

John P. Case in honor of Suzanne Lewis
William Fink
Denis P. Galvin
Richard W. Gregory & Beverly Gregory
Walt & Lora Loope in memory of Meg Hahr
Jerry L. Rogers
Thomas Wylie

SOCIETY NEWS, NOTES & MAIL

Kennedy, Parsons win seats on retooled GWS Board

Barrett Kennedy and David Parsons have won election to the George Wright Society Board of Directors in voting recently completed on-line. The two candidates were unopposed for three-year terms beginning in 2011.

Kennedy is a professor of architecture at Louisiana State University and is former associate dean at the LSU College of Art+Design. He also was a National Park Service historical architect before coming to LSU. Kennedy has been involved in cultural resource documentation research and disaster mitigation projects for over 30 years. Parsons recently retired as the director of the U.S. Forest Service's Aldo Leopold Wilderness Research Institute. Prior to that, he worked as a scientist for NPS at Sequoia-Kings Canyon National Parks. This is Parsons' second stint on the GWS Board.

As we reported in the last issue of *The George Wright Forum,* earlier this year the Department of the Interior's ethics office raised concerns about the possible appearance of a conflict of interest with respect to National Park Service employees serving on the Society's Board. We responded to these concerns forcefully, pointing out that there has in fact been no conflict of interest at any time between NPS-employed Board members' service to the Society and their duties as federal employees: each of them followed government-approved recusal processes for all relevant financial matters, as well as following all other procedures specified in standard memoranda of understanding governing NPS employees' service on outside Boards. We also pointed out that preventing active NPS employees from serving on the GWS Board needlessly restricts their professional development.

Nonetheless, in late August we received notification that National Park Service employees will no longer be allowed to serve on the Society's Board. This action was not initiated by NPS, but by the Department of the Interior. The Board members who were forced to resign were President Rolf Diamant and Secretary David Graber, and at-large members Melia Lane-Kamahele and Robert Winfree. These employees were asked to transition to roles as non-voting NPS liaisons to the Board, and in their first act under this new role they attended the GWS annual Board meeting in late October.

Although we strongly disagree with the decision to ban NPS employees from our Board, we were prepared for it with a transition strategy. Former GWS Board members Gary E. Davis and Rebecca Conard, and GWS Life Member Molly Ross, agreed to join the Board to fill out the unexpired terms of the three elected Board members who were forced to step down. The Board will fill the fourth position, an appointed seat, in the near future.

To complete the transition, at the Board's annual meeting in late October a new slate of officers for 2011 was named. Brent Mitchell, who had succeeded Diamant as president, was formally elected to that position, while David Parsons was tapped to become the new vice president. Gary Davis was elected treasurer and Rebecca Conard secretary. Although the transition to the new, retooled Board was challenging, and there are still a number of issues to work out with regard to the new NPS liaison group, the substantive work of the GWS has continued without disruption.

Lewis receives Audubon's Rachel Carson Award

Former GWS Board Member Suzanne Lewis has been honored with one of the 2010 Rachel Carson Awards from the National Audubon Society. Named for the pathbreaking environmentalist, the award recognizes Lewis's lifetime achievements in her career with the National Park Service, which culminated in an eight-year tenure as superintendent of Yellowstone National Park, from which position she retired in October 2010. Lewis and three other recipients were recognized at Audubon's Women in Conservation Luncheon in New York City in May.

GWS signs on as National Fossil Day supporter

The Society was one of a number of professional organizations to endorse the first annual National Fossil Day, a nationwide educational push to highlight the continuing relevance of paleontology. The event was held October 13 during Earth Science Week. National Fossil Day is a celebration organized to promote public awareness and stewardship of fossils, as well as to foster a greater appreciation of their scientific and educational value. This year's Earth Science Week toolkit includes a "Fossils of the National Parks" poster, featuring a map showing more than 230 parks managed by the National Park Service that contain fossils. The poster also includes a "How to be a Paleontologist" classroom activity.

This Land is Your Land, This Land is My Land: People and Public Lands Redux

Carolyn Finney

"This land is your land, this land is my land. . . ." Woody Guthrie wrote a pretty powerful song back in 1940. He had an idea about what he thought America was and what it means to be an American. Born in Oklahoma in 1912, he lived with a father who fancied himself a cowboy and a mother who was a Kansas-born housewife who simply loved music. Growing up in Okemah, a farm town, Guthrie experienced loss at an early age with the death of his sister, the institutionalization of his mother, and his family's financial ruin as a result of an oil boom gone bust. But Guthrie's family wasn't the only one to suffer. Guthrie watched as many families in Okemah suffered financial and personal loss. Then along came the Great Depression. During this period, Guthrie got married and had three children. But like hundreds of other "Dust Bowl refugees," Guthrie found it difficult to support his family and so he hit the road, trying to find work. During his travels by train and hitchhiking, Guthrie cultivated a strong dislike of greed and a deep appreciation for the diversity of America's everyday people.[1] In February of 1940, he wrote "This Land is Your Land," in response to Irving Berlin's song "God Bless America," which he heard repeatedly throughout his travels. He couldn't abide by the way that song seemed to obscure the "lopsided distribution of land and wealth" that he had seen and experienced his whole life.[2] And so, an anthem was born.

The most amazing thing about this song is its staying power—over the years many singers have recorded this song, and, at the inauguration of our first Black president, Bruce Springsteen and Pete Seeger carried on the tradition. What I like about the song is that it highlights the tensions within the United States over land, wealth, access, mobility, naming, and claiming ownership over many things, including this place and all its natural resources.

The George Wright Forum, vol. 27, no. 3, pp. 247–254 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

And that differences aren't always about race or ethnicity: Guthrie was a white man who had suffered through the Depression and from his experience, his standpoint, wrote a song about what he saw as the American experience on the landscape, one that included the tensions between different groups of people and our natural resources.

Like the song, the issues between people and public lands have been talked about and fought over since the "founding" of this country. According to Webster's dictionary, the word "redux" means to revisit something "that has been brought back, revived, restored."

I would like to take this opportunity to revisit this relationship between people and public lands and challenge us to "seed a new conversation."[3] But first, I need to revisit a piece of my own history. I am interested in how difference (race, gender, class, etc.), identity, representation, and privilege mediate the way individuals and communities are able to participate in environmental decision-making. How does who we are, who we think we are, and how others think of us influence what we do in relationship to the environment? Who gets to decide who has access to land? Who gets to own it? Whose knowledge counts and whose doesn't? I came to these ideas because I've spent a lot of time thinking about my parents.

I grew up in a gardener's cottage outside of New York City—12 acres of scenic, naturally wooded footage, a large pond, all kinds of trees, including fruit trees—in Westchester County. The estate was owned by a wealthy family of contractors who were well known in New York (their name even graces a large building in New York City). In the late 1950s my father returned from the Korean War with his young wife and needed to find a job. For a Black man who had grown up poor in rural Virginia (together with my mother), opportunities were sparse, particularly if you only had a high school education. But family connections proved helpful—he had a sister who had become a nurse and was living in New York. Her husband, a small-time contractor, had heard about a potential job opportunity. A very wealthy Jewish family was looking for a young couple to live on their estate and tend to the property full time. The couple would be provided with a home, and there would be additional duties, including chauffeuring the owners to and from various locations, and doing some occasional housekeeping. My parents considered their options; the only other job opportunity my father was offered was to be a janitor in Syracuse, New York. So my parents packed their few belongings and drove from Floyd, Virginia, to Mamaroneck, New York, where they became the caretakers for this piece of property for the next fifty years.

Adjusting to life on this property was no easy feat; while the land was beautiful to look at, it was far away from all that was familiar to them both. The neighborhood we lived in was affluent and white—we were the only non-white family living (and working) in that area. My parents had grown up in a predominantly segregated southern town where nearly everyone they knew and interacted with was Black and poor. While both my parents were proud and capable individuals, they were constantly reminded that the only reason they were living in this privileged piece of geography was that they worked there.

I remember the first time I became aware of how my presence on this stunning piece of property was seen by others. With homes owned by folks such as Harry Winston and the CEO of Schaefer Beer, police patrolled this neighborhood with regularity. One day, they stopped me as I walked home from elementary school. I was in the fourth grade and was pretty unimpressive-looking: kind of a skinny girl with short hair, lugging her book bag up

the tree-lined hill. The policeman wanted to know where I was going. I pointed down the street and gave him the address. He asked me, "Do you work there?" I remember feeling a bit confused and replied, "No, I live there." I was only nine years old. What kind of "work" would I be doing? From that moment on, two things were happening for me. As I was developing an active appreciation for the natural environment, I was also learning that my presence in certain places and spaces was not expected, welcome, or "natural."[4]

My father mowed the grass (12 acres), tended to the fruit trees (apple, peach, plum, and pear, which had plenty of insect issues and leaves to rake), was responsible for planting the flower beds (there were at least five or six), caring for the garden (my parents grew all kinds of vegetables which we ate on a regular basis), and monitoring the fish pond and swimming pool. My parents, with their 12th-grade education, knew more about that land than the actual owners. But, no matter their knowledge and commitment to this land, this place, their attachment did not result in legal ownership of the land. The original owners passed on and, to their credit, they tried to arrange it so that my parents could stay on the land, but the presence of their children and the reality that my parents could never afford the property taxes (amounting to something like $125,000 a year) meant they could not stay. So today, my parents live in a lovely home in Leesburg, Virginia, with a half-acre of land. While the home is theirs, they often feel depressed, longing for something it seems they can never have. My father in particular, who believes that land is wealth and having land to give to your children is so important, seems so angry and sad. In looking to my parents and their story I began to think about land and ownership—whose land is this, anyway? And is ownership only about a piece of paper, or can it mean something more?

I'll come back to that story in a bit. First, I want to talk about vision and the power in seeing differently. We don't always see the inspiration right in front of us—creativity, innovation, new possibility—because we might not recognize it, value it, or even think it has anything to do with our interests and concerns. Or sometimes we start with what we believe is possible (defined by our limitations) and then try to construct a "vision." Which leaves little room for creativity to spread its wings. Let me give you some examples of what I mean. I spent the last six years or so doing research on African-Americans and the environment. I was interested in broadening our understanding of African-Americans and environment interactions by exploring how the attitudes and perceptions of African-Americans are influenced by racialized constructions and representations, informing how African-Americans participate in the use and management of national forests and parks. What are the linkages between how the Great Outdoors is represented, the "African-American experience" in the United States, and African-American attitudes, beliefs, and interactions pertaining to the environment? I focused on three areas: environment, memory, and place; representation; and racism and diversity. Since I am talking about vision, I want to focus on the representation piece: what we see, what we imagine, and how what we don't or can't see stunts our ability to vision anew.[5]

When I say "representation," I'm talking about the visual representation of African-Americans in popular magazines that focus on environmental issues and/or the Great Outdoors, national park exhibits and materials, and textual representation in these spaces—stories/narratives that shape and support our understanding of these green spaces (and each

other). So—whose stories are being told? Whose pictures do we see? What messages are being given? Who is being targeted? Through what processes are these meanings and representations channeled to the public? The "possibility to make visible" is a concrete form of power. What about what is made invisible?

In the May 2006 issue of *Vanity Fair*, a monthly magazine with national distribution, special focus was placed on environmental issues. Labeled the "green issue," celebrities such as Julia Roberts and George Clooney, resplendent in green, graced the cover alongside politicos Al Gore and Robert F. Kennedy, Jr. Inside this special issue, Al Gore outlined the global warming "crisis" and then shared the "good news" that "we can solve this crisis, and as we finally do accept the truth of our situation and turn to boldly face down the danger that is stalking us, we will find that it is also bringing us a unprecedented opportunity."[6] What followed his optimistic proclamation were twenty-eight pages of photos and text reflecting the voices of well-known eco-activists, environmental organizations, and celebrities who are considered to be proactive in combating the world's environmental crisis. But in the sixty-three pictures of people, only two pictures of African-Americans (and one African—Nobel Peace Prize winner Wangari Maathai) could be found.[7]

Vanity Fair's "oversight" in highlighting hardly any African-Americans or other people of color in their "green issue" speaks volumes about how Americans think, see, and talk about "the environment" in the United States. The representation of the environmental issues and the narrative supporting the visual images provides insight into *who* Americans actually imagine cares about and actively participates in environmental management. In addition, how the environmental narrative is portrayed is an indicator of who is actually being engaged in the larger conversation.[8]

But invisibility and marginalization are not the only challenges to envisioning a more expansive conversation concerning the environment. In 2005, the Gulf Coast of the U.S. experienced the wrath of Hurricane Katrina, an environmental and human disaster that many are still recovering from. For weeks, the media inundated our homes and minds with painful images of a people and place under siege. In particular, the words and images of Black people as refugees instead of citizens, and "looting" and "shooting" during this desperate time, were recorded and shown worldwide, providing an explicit image with an implicit meaning—something that one scholar calls the "logics constructed in visual images that define blackness."[9] These "logics"—the idea that there is an essential and fixed quality to blackness (in the case of Katrina, criminality and poverty)—is indicated as natural and normative by simply showing images of Black people. The power that images and words have in stigmatizing a people or community can have far-reaching psychological and material consequences. How one's identity is constructed through representations calls into question the social realities that are maintained and sustained by such representations, and who benefits from the perpetuation of these depictions. Equally disturbing is how one perspective of an experience, a person, or a place—in this case, African-Americans or the Lower Ninth Ward—can become so embedded in our consciousness through representational acts that we cannot imagine, and therefore do not act on, other possibilities for those phenomena we seek to understand.[10]

In these two examples it is Black people who are invisible, marginalized, or stereotyped. But we often do this to any group of people we see as "different" from us—those we don't notice and who don't fit into some narrowly defined idea of who we think has the most to offer in any given situation. So I want to share with you some examples of two people whose vision went beyond expected boundaries, illustrating that if we see differently, we have the chance to *do* differently.

In 1971, two oil tankers collided beneath the Golden Gate Bridge in California. John Francis, a young African-American man living in the area at the time, decided he had to take a stand against the lifestyle that he believed brought those two tankers together. So he decided that he would not take any kind of motorized transport anywhere for a while. If he needed to get somewhere, he would just walk or ride his bike. At first this wasn't easy. He was continually getting in arguments with well-meaning friends and neighbors about his choice. So he decided to stop talking—period. For the next 22 years, John walked across the U.S. and Latin America to raise environmental awareness, and for 17 of those years, he did it without talking. During this period, he decided to go back to school and he got undergraduate and Master's degrees in science and environmental studies and his Ph.D. in land resources at the University of Wisconsin–Madison. *Without talking*. His dissertation research focused on oil spills, and when the *Exxon Valdez* flooded our waters and our environmental conversations, Francis was the only Ph.D. in the country who had written a dissertation on oil spills. As a result, he worked with the U.S. Coast Guard to create legislation concerning the management of oil spills.

In his sixties now, John travels the world sharing his story and his belief that you can change the world one step at a time. He has written a book, *Planetwalker,* and his story has been optioned by Universal Studios in California and is slated to become a big-screen movie, potentially starring Will Smith. Now I want to pause, because I imagine some of you are thinking, "Ugh—Hollywood is going to ruin this story!" But I want to offer you another perspective. As an African-American, I have so rarely seen a face that reflects my own cultural experience actively engaged in creative and courageous environmental acts. While we are all human (and therefore given some common ground of experience) one would be hard pressed to deny the power of seeing a face that looks like yours engaged in something you never imagined for yourself. *Now* imagine a mainstream, Hollywood movie about a Black man walking across the U.S. and Latin America to raise environmental awareness. Without talking. Starring Will Smith. Imagine all the young men and women, of various hues and shades, that flock to the film to see Will Smith. And imagine their surprise at the truth of the story: that one human being, who looks like them, can make a difference. Visions come in all shapes and sizes—we've just got to learn to recognize and grab hold of them when we get the opportunity.

Another person "doing differently" is Brenda Palms Barber, executive director of Sweet Beginnings in Chicago, Illinois. In 1999, she moved from Denver to Chicago to become the executive director of the Northlawn Employment Network, where she thought her primary focus would be to help build a consortium that focused on job readiness by addressing capacity challenges. What she discovered is that the community wanted a direct service

agency—someone who could help them find jobs. She realized that many of the men and women had been previously incarcerated for low-level crimes and most were African-Americans suffering from skill shortages and the stigma of being ex-offenders. So Brenda focused on creating a job readiness program she called U-turn Permitted to address the needs of formerly incarcerated men and women. While her program was initially successful, after 9/11 and the passing of the Patriot Act, potential employers, motivated by the fear of terrorism, began conducting background checks. Consequently, many of the formerly incarcerated lost their jobs. "I felt at that moment, I had to do something" to help create jobs for people, Palms Barber admitted. What was going to make Palms Barber different? She realized that in order to honor her commitment to the community, she was going to have to build a business that generated income to support the non-profit. She needed to diversify her funding stream in order to be able to stay in North Lawndale for the long haul. "I personally felt an obligation."[11]

So Palms Barber considered a number of ideas: a temp agency, a landscaping company, and a delivery service. But while all of these ideas were good, Palms Barber was looking for a *great* idea. One day, she was talking to a friend who told her a story about someone who was a beekeeper. And a light bulb exploded in Palms Barber's mind. She was going to start a honey-making business and train previously incarcerated men and women in Chicago to care for bees and make the honey! There were many who met Palms Barber's proclamation with incredulity. But Palms Barber had vision: she saw the links between skill development possibilities unhampered by the need to have a college degree and building self-esteem for those she believed deserved a second chance. So she worked with beekeepers, corrections officers, and those knowledgeable about business to start Sweet Beginnings, a company that makes urban honey and honey-related products in the Chicago area. What she also got was an added bonus—she became an accidental "greenie." Now she intentionally infuses green business principles into the work that she does: the product they produce is local, African-Americans can reclaim their relationship to the earth through beekeeping, and she believes that "through green" people can become empowered. Sweet Beginning products are sold at Whole Foods and other high-end stores in the Chicago area, and you can buy the products online. "People need to be reminded that they are important and can make a positive contribution," says Palms Barber.[12]

Many of you reading this article work in the National Park Service and may be wondering how "seeing differently" and taking creative risks translate to instilling a sense of ownership in individuals and communities concerning the national parks. I recently had the pleasure to meet a young, talented African-American teenager named Aisha who had participated in a program sponsored by NPS and the Latino American Youth Center in Washington, D.C., called Second Nature. This past summer, through a program focused on the arts, African-American and Latino teenagers were taken out on camping trips to national parks in the D.C. area, many for this first time. They learned how to set up tents, sleep outside, and slog through mud and rain, while still having a good time. Afterwards, the young women and men were prodded to share what they had experienced through music and painting. Some participated in a mural project at the National Zoo. Some wrote powerful slam poetry about climate change. And others, such as Aisha, wrote songs about their relationship to the natural

environment. One young man, who rapped about his experiences, also spoke about getting his family and friends out to the park. Another was provoked to think about recycling differently—a piece of trash on *his* city street took on a whole new meaning. Their visions of the world expressed through painting, spoken word, and song were painful, funny, hopeful, and real. While I can only speak for myself, I had a feeling that the other adults in the room were also inspired by the thoughtfulness and possibility inherent in what we heard—these are the new stewards, the caretakers of our natural places. Vision belongs to us all—we just need to be able to recognize and support it. Fourteen-year-old Aisha, in all her youthful wisdom summed it up best: "Nature is cool, now. We have to keep thinking of tomorrow, today."[13]

I want to come back to the idea of ownership and the story about my parents. A while back, I was visiting my parents and they told me about a letter they had recently received from one of their old neighbors in Mamaroneck. The letter was from the Westchester Land Trust. The trust had determined that the property has "extensive scenic, naturally wooded frontage" and because it's in the Mamaroneck River Watershed—the river is subject to flooding—preservation could help prevent further flooding. They also determined that the large, permanent pond on the property is a significant habitat for fish, turtles and waterfowl. There are also mallards, blue herons, wild turkeys, and deer. The trust had sent the letter out to let neighbors know that the new owner had generously donated a conservation easement on the land to the Westchester Land Trust. Which means that although the property contains the new owner's home, the land will never be further developed and the trust will ensure that its conservation values are protected. In the letter, the trust thanks the current owner for his "generosity and conservation-mindedness."

But something was missing. There was nothing about my parents, who loved and cared for that land for fifty years. This got me thinking about all the people who have been invisible in the story of this land. Of all the people, because of their "difference," that have gone unseen, uncounted, devalued, and dismissed in the larger process of creating an American environmental narrative that reflects who we are and who we can be. For me, ownership and vision are inextricably linked; when Guthrie wrote "This land is your land, this land is my land," he acknowledges that not only do we all have the right to belong to this place and call it home, but he also possesses a vision that is wide enough and deep enough to *see* us all in the larger story of this land.

Recently we celebrated the signing of the Constitution on September 17, 1787. I started thinking about "We the People." The Constitution represents powerful ideals, but the men who wrote the Constitution, the "founding fathers," had limited vision. They couldn't always see the other fathers working the land, sowing the seed, fishing the seas. They couldn't always see the mothers' hands in the dirt, preparing and sharing the food. They couldn't see my father's grandfather with no last name, but present nevertheless. They couldn't see the American Indians who hunted and fished and gathered and prayed; they couldn't imagine the many Asian peoples who came to this soil: the Chinese who built the railroad, the Japanese who farmed and later were forced to walk away from their land; the Hispanos in New Mexico whose connection to the forests is handed down through generations. They couldn't see the Brenda Palms Barbers, the John Francises. And they didn't know how to see my father and my mother, who had given their life to the land for their family, for the future.

But *we* can see differently. We the people must be willing to stand in the tension of our differences and accept the pain and loss that influences human–environment interactions today. Clean air and water, good food, our mental and spiritual health relies on our vision—our ability to see beyond the barriers of our fear, our power, and our privilege. It is our responsibility to love this land. We the people will not go down in history saying that we didn't fight for this land, for our right, for our privilege to be part of the change that is needed. The founding fathers couldn't see this. But they were "we the people" then. You and I are "we the people" now.

Endnotes

1. From woodyguthrie.org.
2. From the Library of Congress website.
3. As worded by my friend, public lands advocate Audrey Peterman.
4. Partially excerpted from an essay I wrote for the upcoming anthology, *Companions in Wonder: Reflections on Children and Adults Exploring Nature,* J. Dunlap and S. Kellert, eds. MIT Press.
5. These examples are taking from my forthcoming book, *Black Faces, White Spaces: African Americans and the Great Outdoors,* based on my dissertation research.
6. *Vanity Fair,* May 2006, p. 172.
7. Excerpted from *Black Faces, White Spaces.*
8. Ibid.
9. P.A. Rogers, "Hard Core Poverty," in *Picturing Us: African-American Identity in Photography* (New York: The New Press, 1994), p. 160.
10. Excerpted from *Black Faces, White Spaces.*
11. Ibid.
12. Interview with Brenda Palms Barber, May 22, 2009.
13. Partially excerpted from *Black Faces, White Spaces*.

Carolyn Finney is assistant professor in the Department of Environmental Science, Policy & Management of the College of Natural Resources at the University of California–Berkeley. Her focus as a geographer is to explore how issues of difference impact participation in decision-making processes designed to address environmental issues. The aim of her work is to develop greater cultural competency within environmental organizations and institutions, challenge media outlets on the (mis- or non-) representation of "different" folks, and increase awareness of how privilege shapes who gets to speak to environmental issues and determine policy and action. She served on the National Parks Second Century Commission.

The Heart of the Matter

New essential reading on parks, protected areas, and cultural sites

Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change. Edited by David N. Cole and Laurie Yung. Island Press, $70.00 (hardcover), xiii + 287 pp.; ill.; index. ISBN: 978-1-597-26508-9. 2010.

Reviewed by David Harmon

I TAKE IT AS A MARK OF MATURITY when a movement, such as the conservation of parks and protected natural areas, not only tolerates but encourages the development of a critical self-consciousness. If one looks back at the tenor of the last 30 years in our profession, I think it is safe to say that it has indeed matured: from being a movement of more-or-less unabashed advocacy to one of advocacy tempered by reflection, by the acknowledgment that the proper way to manage parks is not nearly so simple as we first thought, and certainly not self-evident.

The third World Parks Congress, held in Indonesia in 1982, marked the first real sea change in park management philosophy by recognizing the needs of local communities as an important concern. It was the beginning of the move, which continues unabated today, away from insularity, away from the old idea that we can just leave nature be within the boundaries of a protected area and everything will take care of itself. The proceedings of that congress, edited by two long-time stalwarts of IUCN, Jeff McNeely and Kenton Miller, was, to my mind, the benchmark parks publication of the 1980s.

The trend toward broadening the remit of parks, and re-examining long-held management assumptions, surged in the 1990s. Publication after publication confirmed that the old ways of doing business were no longer effective—if they ever were. The full complexity of the social movement that is park conservation began to emerge: ecologists turned old assumptions on their head, managers saw that laissez-faire was not going to cut it, social scientists began to insist that their perspectives and those of the groups they advocate for be included in planning and management, and cultural heritage professionals helped usher in an efflorescence of diverse interpretations of the meaning of the past.

In terms of revisionism, the high-water mark of the decade was the publication in 1995 of William Cronon's edited volume *Uncommon Ground: Rethinking the Human Place in Nature,* which contained his highly influential—and to many, disconcerting—essay "The Trouble with Wilderness; or, Getting Back to the Wrong Nature." Cronon's call for our conception of wildness to "stop being (just) out there and start being (also) in here" struck what-

The George Wright Forum, vol. 27, no. 3, pp. 255–259 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

ever residual complacency as may have remained among park conservationists like an earthquake. The tremors are still being felt today.

So we continue to seek a way forward, and as we do, clear signposts are quite useful. One of these is provided to us in the form of David N. Cole and Laurie Yung's new book, *Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change.* If *Uncommon Ground* was the watershed book of the 1990s in North American park conservation, *Beyond Naturalness* is the game-changer of the first decade of the 21st century. I cannot think of a recent book that has probed so thoroughly and effectively the fundamental dilemmas facing parks and protected areas.

The point of attack is the observation, in an introductory chapter by Gregory H. Aplet and Cole, that "*natural* is a commonly used word with multiple meanings," such that "different people use the term in very different ways and are often not conscious of how their definitions differ." But the problem is not just a definitional one, with the pitfall of people talking past each other or working at cross-purposes; it is a matter of there being an overweening reliance on this one concept as the sole benchmark of successful park management. Aplet and Cole go on to assert that this stance has become untenable because "changes in science and society and the globalization of human influence have eroded the adequacy of naturalness as a guiding concept for protected area stewardship." The changes in science of which they speak include the evolution of ecological understanding away from equilibrium to dynamism, the advent of restoration ecology, better understanding of the historical effects of indigenous people on the environment, and the emergence of the concept of biodiversity. As for the globalization of human influence, little really needs to be said: climate change changes everything.

What this means in management practice, say Aplet and Cole, is that

> Global environmental change precludes the ideal stewardship option in parks and wilderness: that release from human control will increase historical fidelity and pristineness. Protected area managers [either] must choose to increase historical fidelity through restoration, accept the change that will result from less intervention and control, or transform ecosystems to future states that are not true to the past but will protect important values and be more resilient in the face of global change.

In other words, we can *resist change* via ecological restoration, *accept change* and allow matters to drift as they may, or *guide change* through proactive transformation of conditions in protected areas. What we cannot do is *prevent change* and cling exclusively to outdated and often confused ideals of naturalness.

That is provocative stuff. But note that I qualified the last sentence with the word "exclusively." *Beyond Naturalness* is not saying that the concept of nature is obsolete; it simply is no longer sufficient. Rather, what we need now is "an expanded array of tools and concepts, framed in more clearly articulated policy." The rest of the book explores what this might mean. There are context-setting chapters on the development of a more sophisticated ecological understanding, the challenges posed by an unprecedented and unpredictable future of global change, and the evolution of conservation policy and management practice.

This is followed by a set of chapters from across a spectrum of conservation approaches: hands-off, ecological integrity, historical fidelity, and resilience thinking. The final part of the book explores possible future management strategies, touching on invasive species, climate change, continental-scale matrix management, planning for uncertainty, and wild design, capped off by a synthesis chapter.

There are no weak chapters in the collection, so my highlighting of just a few is a matter of expediency, nothing more. The discussion of "Shifting Environmental Foundations" by Nathan L. Stephenson and colleagues is an admirably clear discussion of the range of challenges now facing protected area managers for which there is no analogue, no benchmark, to step off from. It helps set the stage for alternatives to naturalness, of which perhaps the most promising is Parks Canada's ecological integrity approach, convincingly described here by Stephen Woodley. Peter Landres contributes a powerful "pushback" chapter in which he argues that we do need to let certain lands be, especially large, isolated areas within a bigger managed-for-conservation matrix. And I found the chapter by F. Stuart Chapin and colleagues on "Planning in the Context of Uncertainty," with its focus on scenario-building, to be an especially valuable outline of a real-world strategy for planning in the face of overwhelming complexity.

Cole and Yung have taken great care to integrate the various chapters into a work that flows seamlessly. One of the big challenges of doing a book of contributed papers—and I can personally attest to this—is to weave the distinct voices of the chapter authors into a cohesive whole so the thing doesn't read like a random conglomeration. *Beyond Naturalness* is exceptionally tightly edited in this regard, with almost every chapter cross-referencing others so that readers are continually reminded of how the ideas being presented relate to each other.

Good as it is, *Beyond Naturalness* is not above all criticism. There are two significant gaps in the book, as I see it, each related to the other. First, there is no representative of the emerging biocultural approach to conservation: one which regards the concepts of "nature" and "culture" as interpenetrating rather than rigidly distinct from one another. There is a growing literature on biocultural diversity, much of it centered on the perspectives of indigenous people, and it would have been valuable to have a chapter focused on this because it is an approach that is very different from Western science. Second, there is no chapter explicitly examining the meaning of values, and the social processes by which they are formed, as they relate to parks and protected areas. I find that this is a common oversight of books in our field: "naturalness" and the alternatives offered here—"ecological integrity," "historical fidelity," "resiliency," "wild design"—are all values, not precisely definable end-states. It would have been good to have a chapter by a social scientist or an environmental philosopher that honed in on the distinction between facts and values (often blurry, actually!) and how people mediate between them.

And I have to say that, as compelling as the overall argument of the book is, I find that my innermost sympathies still lie with Landres and the admonitions of humility in his chapter "Let It Be: A Hands-off Approach to Preserving Wildness in Protected Areas." Nature, I firmly believe, is real, not just a social construct; and even though it is often difficult to disentangle from humans and our cultural impacts (and, as I've just suggested, developing an awareness of how they interpenetrate is useful), it does exist as part of a continuum that runs

from wilderness to city. "Naturalness," then, is not just a set of conflicting definitions of ecological conditions: it is itself a value, a value that coalesces around the proposition that there are forms of life that have autonomy, in that their life trajectories are not controlled or dominated by people. "This," writes Landres, "is a long-term societal value and benefit that is at the heart of the direct interplay between people and the environment."

He is here referencing an essay—an important one, I think—of the late Australian environmental philosopher Val Plumwood. I'd like to pull a couple of quotes from it to remind us, first, that words are important, and second, that as conservationists we downplay the concept of nature at our peril:

> The deep contemporary suspicion and skepticism about the concept and term "nature" may play some role in the contemporary indifference to the destruction and decline of the natural world around us. If the category "nature" is seen as phony, if it can appear only when suitably surrounded by sneer quotes, we are hardly likely to be inspired by appeals to nature's integrity in the case against genetic engineering or for the defense of nature in the case for stopping the current slaughter of the seas and the holocaust of animal life. The more nebulous and indeterminate such nature skepticism is, the more difficult to dispel is the general sense of unease the term "nature" seems to arouse in the modern and especially the postmodern mind. Even if that unease can be justified for some areas of usage, the danger is that it will contaminate perfectly defensible and useful, even indispensable, roles for the concepts of nature, in a way that will make important conservation causes very difficult to articulate convincingly. Should we then abandon "nature" as the banner term under which we might try to resolve the ecological crisis? I suggest the answer is "no" (Plumwood 2005, 25).

She concludes—and I am 100% with her—that "we have a long way to go in recognizing and consciously maintaining the ecological relationships on which human culture depends. The concept and experience of nature are needed to make these relationships more apparent to people living increasingly urbanized lives in what they think of as culture, a sphere often but mistakenly seen as of exclusively human construction and agency" (Plumwood 2005, 44). In short, the more we think we are divorced from nature and its qualities of naturalness, and the more we think we can be, the more we need them.

So—*beyond* naturalness? Not yet; and, I hope, not ever, if "beyond" is taken to mean leaving the idea of nature behind. But that, clearly, is not what the contributors to this splendid book mean. They want us to manage our parks and other protected areas with *more* than naturalness in mind, and with that goal I wholeheartedly agree.

References

Cronon, William, ed. 1995. *Uncommon Ground: Rethinking the Human Place in Nature.* New York: W.W. Norton.

McNeely, Jeffrey A., and Kenton R. Miller, eds. 1984. *National Parks, Conservation, and Development: The Role of Protected Areas in Sustaining Society.* Washington, D.C.: Smithsonian Institution Press.

Plumwood, Val. 2005. Toward a progressive naturalism. In *Recognizing the Autonomy of Nature: Theory and Practice.* Thomas Heyd, ed. New York: Columbia University Press, 25–53.

David Harmon, George Wright Society, P.O. Box 65, Hancock, Michigan 49930-0065; dharmon@georgewright.org

---

Ed. note: "The Heart of the Matter" is a new feature of *The George Wright Forum* that highlights books we think will be of lasting value to park professionals. Each installment focuses on a recently published book that, in some way, gets to the core of our work on behalf of parks, protected areas, and cultural sites. If you have read a recent book that you think should be profiled in "The Heart of the Matter," we'd like to hear from you. Email us at info@georgewright.org.

Natural Resource Challenges in Parks Assessed by NPCA's Center for State of the Parks

Gail Dethloff

In establishing the National Park Service (NPS), the Organic Act of 1916 stated that national parks have a fundamental purpose "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." However, in the first 100 years of the NPS, there have been limited efforts to address the significant task of determining whether or not the NPS is able to meet that goal; not until the last decade have programs been put in place in a systematic way to address how successful the conservation of natural objects and the wildlife therein has been within national parks. Through the Natural Resources Challenge, funded in 1999, NPS has received a portion of the funding needed to evaluate, first, what resources exist at individual national park units; second, what condition they are in; and third, what natural resources will be continually monitored as indicators of the overall condition of natural systems and how will this be done. Parks covered by the National Park Service's Inventory and Monitoring Networks and Vital Signs Program have, for the most part, completed the first step in this process. Determining conditions of resources is requiring more extensive efforts, and in many cases the second and third steps are being worked on concurrently. Certain parks have received an evaluation of natural resource conditions through NPS national programs (e.g., Inventory and Monitoring, Coastal Watershed Assessment/Watershed Condition Assessment/Natural Resource Condition Assessment), while many others await their turn. In addition, understanding the condition of natural resources across the national park system as a whole is not easily done because the resources that have been selected for evaluation may differ among parks.

In 2000, the Center for State of the Parks (CSOTP) was initiated by the National Parks Conservation Association, partly because of the shortfall of information on the success of conservation efforts within the national park system. CSOTP has the goal of developing a complete, comprehensive, and informed understanding of resource conditions in America's national parks, using standardized methodologies to collect needed information. The center conducts both cultural and natural resource assessments in individual park units, seeking to identify and understand both park-specific and systemwide issues and threats that challenge

The George Wright Forum, vol. 27, no. 3, pp. 260–268 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

the immediate and long-term integrity of park resources. The center completed its first park assessment in 2002 (an assessment of Adams National Historical Park), and since then has completed research on natural resources at 54 national park units that cross a range of geographic areas, ecoregions, cultural themes, and NPS designations. Publications and other products resulting from this research detail the state of natural resources at a given park. Assessments identify conditions at a park based on information available at the point in time when the assessment was conducted. Researchers from CSOTP evaluate habitat condition, fragmentation, non-native species, air quality, water quality, and disturbance regimes (focusing for this document on fire, grazing, and climate change), gathering information on up to 124 separate measurements of park resources and assigning a score indicating level of impairment of the resource (none, limited, widespread, complete, or insufficient data available). CSOTP has also noted where data are consistently lacking on natural resources.

Overall, CSOTP research at this subsample of parks has found natural systems to be degraded to some degree at the vast majority of parks. Because of both the history of land use in and around parks, such as grazing, logging, and farming, and contemporary activities on lands adjacent to parks, including transportation corridors, energy extraction, urban and industrial development, and agriculture, many national parks are internally fragmented as well as isolated from each other and other natural areas. Privately owned lands within park boundaries are also increasingly targeted for residential and commercial development.

A number of native species are declining or being lost entirely from parks, often resulting in a significant change in the structure of natural systems (e.g., hemlock loss due to the hemlock wooly adelgid greatly alters the structure of eastern forests in a number of eastern parks). The almost ubiquitous spread of non-native plants and animals, which have been introduced either intentionally or accidentally or have spread from adjacent lands, contributes to native species declines and also can alter natural processes. Continuing declines in water and air quality and changes in the amount of water and the timing of its availability add to the stresses on natural systems. Most national parks will also soon feel the effects of climate change. As evidenced above, human activities are resulting in many of the deleterious impacts on national parks. As such activities increase and spread, further declines will be seen if practices continue as they currently are. Further details on the findings are presented below.

Habitat loss and degradation

A habitat is defined as an environment where a plant or animal naturally lives and grows. Habitat loss or degradation is often associated with a decline in or loss of native species, and may also result in the loss of ecosystem functions, such as water or nutrient cycling. For the parks evaluated by CSOTP, 96% suffered loss or degradation of habitat; for 41% of all parks, the events were considered widespread. Agents of these changes are multiple, and are illustrated through the following examples:

- At Fort Union Trading Post National Historic Site, loss of the shortgrass prairie, which was the historic ecosystem in the park, was due to the loss of bison, the introduction of agriculture and its associated invasive grass species, and the suppression of fire.

- Hawaii Volcanoes National Park experienced extensive grazing and the invasion of numerous non-native plant species, which has severely impacted canopy and understory plant species.
- The pronounced loss of coral species at Virgin Islands Coral Reef National Monument has been attributed to disease (linked to climate change) and subsequent hurricane impacts.
- Big Bend National Park experiences significant flow reductions (to the point where the channel may run dry) and degraded water quality in the Rio Grande because of the demand for water from increasing human populations.

Other metrics for habitat condition that CSOTP investigates show similar patterns. Cover loss or bare soil increase was noted at 80% of the assessed parks. However, this percentage is likely to be artificially low, because issues in freshwater and marine systems are not often reported under this metric, and it also does not consider change in cover species (be they trees, shrubs, or something else) to be detrimental. When considering changes to the canopy or to the understory, both of which can alter habitat characteristics, 90% of parks assessed were affected, with 30% of the total considered to have pronounced impacts. Parks such as Lewis and Clark National Historical Park and Pictured Rocks National Lakeshore have forests that are still recovering from intensive logging activities that occurred decades ago. Chickamauga and Chattanooga National Military Park battles widespread invasions of Chinese privet that infest the understory of the park's forests. And a number of the islands at Apostle Islands National Seashore are experiencing concentrated deer browsing that is decimating Canada yew and starting to affect other understory species.

A summary of habitat conditions at parks assessed indicates numerous impacts with no shortage of pervasive problems. When all data on habitat condition were considered, parks that most consistently were rated as unimpaired were found in Alaska and Montana. Further analysis below highlights many of the specific reasons underlying habitat loss and degradation.

Fragmentation

Habitat fragmentation occurs when a large area of habitat is transformed, through various activities, into smaller patches that add up to a smaller total area. The areas surrounding these smaller patches often are not only no longer suitable habitat but also present barriers to movement of species. Issues with habitat fragmentation were found in many evaluated parks. Lack of connection among habitats and species isolation were not considered to be issues in 32% of parks, but 20% of parks had widespread problems. Certain parks were initially fragmented in their creation, for example:

- Indiana Dunes National Lakeshore is made up of two larger parcels and numerous noncontiguous satellite sites.
- Nez Perce National Historical Park consists of 38 sites, only seven of which are controlled or influenced by NPS management.

- Harpers Ferry National Historical Park is made up of more than ten individually acquired land parcels.
- Big Thicket National Preserve is composed of nine land units and six river and stream corridors distributed over 1,885 square miles of southeastern Texas.

Fragmentation has been exacerbated at these sites by roads, rights-of-way, and urban and industrial development. In addition, Harpers Ferry National Historical Park, Indiana Dunes National Lakeshore, and a number of other park units contain inholdings (privately held parcels within park boundaries), which also contribute to the loss of natural conditions if incompatible development occurs on them. Fragmentation within a park may also be the result of past land use. For example, at Channel Islands National Park, historic grazing resulted in the isolation of native plant species in areas that were inaccessible to grazers, and often far from each other. Also, aquatic systems within parks can be disconnected. A vivid example is the two units of the Missouri National Recreational River, which are isolated from each other, and the rest of the river, by dams.

Analysis of data collected on dispersal and recolonization barriers, which tended to consider whether the parks were isolated from their external environment a bit more than the previous metrics discussed, found that 72% of parks have barriers. In some units, barriers were inherent in the creation of the park. For example, the small size of Cabrillo National Monument and its location on a peninsula, next to U.S. Navy property, naturally resulted in barriers to certain species. Other parks, such as Fort Union Trading Post National Historic Site and Knife River Indian Villages National Historic Site, which exist in what historically was a shortgrass prairie ecosystem, contain native species that are isolated from recolonization sources by invasive and cultivated species whose presence has altered an entire region. Roads and development are mentioned above as causes of fragmentation, and in the case of Santa Monica Mountains National Recreation Area, an extensive research program is showing their effects on the movements of animals such as mountain lions.

Adjacent land development contributes to the disconnection of a park unit from its natural, surrounding environment, and it also has impacts on environmental quality at the park (see below for more on air and water quality). In evaluating both current impacts and future threats of adjacent land use on park units, 91% were considered impacted or threatened by development activities that included roads, agriculture, urbanization, and industrial development.

Non-native species

Non-native species damage park ecosystems by eliminating native plants and animals, often changing soil and microclimate conditions in ways that fundamentally alter physical habitat as well as system functions. Ninety-four percent of parks had non-native species issues. Lake Clark National Park and Preserve and Denali National Park and Preserve, both in Alaska, are the only two parks assessed by CSOTP, to date, that did not exhibit any net loss or degradation attributed to exotic species at the time of their assessments. Ninety-three percent of parks suffered impacts from non-native plant species; non-native animals were a concern at

72% of parks. Whereas non-native animal species were rated as having widespread impacts at only 9% of parks, non-native plants were considered a significant problem at 41% of parks. Non-native animals have significant impacts at parks such as:

- Assateague Island National Seashore, where feral horses and sika deer graze and trample native plant communities.
- Big Bend National Park, where feral hogs have overgrazed grasslands and exotic fish have contributed greatly to the decline of native fish in the Rio Grande.
- Sleeping Bear Dunes National Lakeshore, where the many invasive aquatic species in Lake Michigan have altered communities of native aquatic species, and the introduction of deer onto North Manitou Island has scarred the understory community.
- Exotic plants have altered or come to dominate systems in a number of parks, with examples including.
- The invasion of tamarisk along riparian corridors in parks such as Big Bend National Park and Canyonlands National Park.
- The almost complete replacement of native prairie systems by non-native grasses at Fort Union Trading Post National Historic Site, Knife River Indian Villages National Historic Site, and Nez Perce National Historical Park;
- The invasion of annual grasses and the retreat of most native Mediterranean vegetation communities at Channel Islands National Park.
- The invasion of faya tree, a nitrogen-fixing species that can colonize barren lava before native species, at Hawaii Volcanoes National Park.

Both land-use history (e.g., historic grazing, farming, and homesteading) and adjacent land use contribute to the current issues with non-native species. A lack of resources to adequately combat invasive, non-native species seems to be a pervasive problem among parks assessed. In addition, better education about non-native species and actions visitors can take (such as washing plant material from boots) could decrease the spread of non-native species.

Air quality

Air pollution can cause damage to species and ecosystems, and can also be detrimental to the visitor experience, particularly when it results in declining visibility in national parks. Nitrogen and sulfur compounds, which can be carried by winds and deposited on park lands, are linked to acid rain and to excess nitrogen effects in aquatic and terrestrial systems (including imbalances in available plant nutrients that can lead to changes in plant composition and loss of biodiversity). These chemicals were considered to be a limited but notable threat in approximately 50% of the evaluated parks, while 9% of parks reported concentrations considered to be very detrimental. Three parks, Shenandoah National Park, Indiana Dunes National Lakeshore, and Great Smoky Mountains National Park, had high deposition of both nitrogen and sulfur compounds. Great Smoky Mountains and Shenandoah National Parks are very sensitive to acidification from deposition of nitrogen and sulfur compounds, whereas Indiana Dunes is likely less sensitive because of the buffering capacity of local waterways and soils, including Lake Michigan. High concentrations are primarily attributed to the parks'

proximity to significant pollution sources such as coal-fired power plants. Concerns about excess nitrogen focus on ecosystems with short growing seasons, thin soils, or sparse vegetation that are less likely to have the capacity to assimilate excess nitrogen. Fifteen to 18% of parks lacked data on these two pollutants.

Fifty percent of parks experienced ozone levels that could impact resources, although work on identifying impacts was limited; in a number of cases, for example, ozone-sensitive plants resident in a park were identified but not monitored for ozone damage.

Increasing levels of particulates are one factor in declining visibility, and evaluation of these two metrics (particulates and visibility) was relatively similar across parks. Twenty-four percent of parks were not considered to be impacted by particulates and 20% were not considered to have impaired visibility. Data were insufficient to evaluate particulates at 26% of parks and visibility at 20% of parks. In most cases, parks that had pronounced problems with particulates were also rated as having a significant decline in visibility. Joshua Tree National Park, Great Smoky Mountains National Park, Shenandoah National Park, and Big Bend National Park were all in this category.

Elevated atmospheric deposition of mercury is a concern not only because of mercury's toxic qualities but also because mercury that lands in waterways can be converted into methylmercury by microbes. Methylmercury can then accumulate in aquatic animals at levels that may harm them or the animals that eat them. Human sources of atmospheric mercury include coal-fired power plants, incinerators, and mining. A relatively limited monitoring network exists for this element, and thus, no information was provided for 74% of the parks assessed. Mercury was a concern in 12 of the remaining 14 parks. Biscayne National Park, Great Smoky Mountains National Park, and Indiana Dunes National Lakeshore, which are all in a region of heavy industry and/or power generation, were most affected.

Water quality and quantity

The increasing demand for water and impacts on water quality that come with increases in human populations affect national parks. CSOTP attempts to gather information on 25 water quality measurements; ten of those are discussed here. Data are often available only for a limited number of waterways in a park; therefore, this summary is based on best available information but should not be considered to portray comprehensive water quality data for each park assessed. Acid deposition and pH alterations were found to affect less than 25% of parks assessed. Over 90% of parks had some measurement of pH; however, 32% did not have information on acid deposition in waterways. Shenandoah National Park, Great Smoky Mountains National Park, and Indiana Dunes National Lakeshore were all considered at high risk for acid deposition, but only Shenandoah was also rated as having significant alteration of pH in waterways.

Other factors resulting in deteriorating water quality include metals (61% of assessed parks), nutrients (59% of assessed parks), and organic wastes, primarily fecal coliform bacteria, which indicate sewage contamination and possibly the presence of disease-causing organisms in the water (74% of assessed parks). Metal concentrations in parks that are considered high or pervasive enough to have a pronounced impact on resources arrive from a variety of sources: long-range atmospheric deposition (Isle Royale National Park), non-point

source pollution of upstream waterways (Big Hole National Battlefield, Nez Perce National Historical Park), dumping into and concentration of industrial pollutants in major water bodies (Cabrillo National Monument), and a combination of the above (Gateway National Recreation Area, Indiana Dunes National Lakeshore, Shenandoah National Park, Mojave National Preserve). Elevated nutrient concentrations are mostly due to atmospheric deposition of nitrogen and agricultural practices carried out both inside and outside parks; these elevations can lead to increased turbidity and algal growth, fouling waterways and putting aquatic species at risk from elevated temperatures and decreased oxygen and flows. Organic wastes are entering park waters primarily from grazing animals, feral animals, improperly maintained septic systems, municipal sewage treatment plants, and untreated human waste (for example, boaters discharging waste). Organic compounds also impact water quality, but analysis for such compounds (i.e., PAHs, PCBs, certain pesticides) is sporadic. Only 43% of parks assessed had any data on them, and the majority suffered some impairment of water quality. Sedimentation was not considered a concern in 13% of the parks; 24% did not have information on this metric. Reasons for increased sedimentation in the other 63% of parks included logging, roads, and agricultural and ranching practices.

Finally, water quantity metrics were also evaluated for the parks. Information on diversion and flow were not available for approximately 21% of the parks; 42% of parks had diversions of waterways that impacted park resources, including in-channel flows. Alterations were most notable at parks such as Big Bend National Park (where upstream diversions have resulted in the Rio Grande channel running dry), Missouri National Recreational River (both units are bounded by power-producing dams), Biscayne National Park (water no longer reaches the Biscayne Bay from the Everglades), and Lewis and Clark National Historical Park (the Lewis and Clark River is altered by dams, municipal withdrawals, levees, and dikes).

Disturbance regimes (fire, grazing, climate)

Disturbance regimes refer to processes, many of which are natural but have components influenced by humans, which disturb biological communities. Sometimes disturbances have minimal impact if the community is resistant to the events and recovers easily (e.g., seasonal flooding in wetland communities), and sometimes they have more devastating results (e.g., crown fires due to high fuel loads). Fire is an inherent feature of almost all ecosystems. However, alterations in the fire regimes of most systems, including those within parks, have come with human habitation and resource extraction. They have also occurred because of practices and policies designed to manage natural resources on public lands. Seventy-four percent of parks have altered fire regimes. The majority of these parks have a history or a current policy of fire suppression. Although the value of fire is now better understood, and prescribed burns are conducted at some parks to mimic natural fire regimes, suppression may still be the norm, even when prescribed burns are considered a better ecological alternative, for historical, logistical, regulatory, and public safety reasons. In many cases, suppression results in unwanted side effects, such as high fuel loads, with the possible outcome of intense blazes, and the presence of non-native plant species. At Chickamauga and Chattanooga National Military Park, fires have been suppressed for 150 years, and a large-scale return to the

historic fire regime is unlikely given the proximity of the park to urban areas. However, this lack of fire has resulted in a dense understory layer in the forests and has allowed woody species to encroach upon rare glade habitats. Human-caused fires that occur at a much higher frequency than historical cycles are another alteration seen at some parks. While fire is a natural component of the ecosystem at Santa Monica Mountains National Recreation Area, the number of human-ignited fires has fundamentally changed the fire regime. There is a direct correlation between increased human population, increased fire frequency, and increased area burned annually. Increased fire frequency has caused the loss of some native plant communities (valley oak savannah, native grasslands, and coastal sage scrub) with conversion of these communities to invasive grassland species that are more tolerant of frequent fire.

In many cases, both native and domesticated grazing species occupied park lands before the national parks were created, and left their mark on plant communities; at some parks, evidence of grazing is still obvious. Grazing or browsing impacts on resources, including plant communities and water quality, have been noted at 69% of parks; these are considered pronounced at 22% of all parks. Examples of parks with widespread grazing impacts include:

- Cumberland Island National Seashore and Assateague Island National Seashore (ongoing grazing of feral animals);
- Channel Islands National Park and Hawaii Volcanoes National Park (historic grazing by domestic stock); and
- Apostle Islands National Lakeshore (overbrowsing by deer with few natural predators).

Changes in global temperature have been recorded over the past century along with a rise in carbon dioxide concentrations. Other aspects of climate, such as precipitation, are expected to or have already begun to change. For 56% of parks, climate change is currently having a limited impact or is viewed as a tangible future threat given prediction models. Thirty-two percent of parks had insufficient data to determine a level of current or future impairment. Parks along coastlines and in alpine areas may have the most immediate need to respond to climate change. It is expected that resource degradation from changes in climate will increase across the park system as time progresses.

Other data gaps

Specific gaps in information were identified in the sections above on air and water quality. But there were a number of sections in the CSOTP natural resources methodology with metrics that consistently were scored as having insufficient data to determine condition. The most telling were sections on community structure and function and on biotic interactions. Data to address metrics under both of these sections come from studies on higher-order biological interactions, such as those seen between species (e.g., predation, competition) and among species (e.g., food web dynamics), and on community structure (e.g., age class structure of species) and ecosystem function (e.g., nutrient cycling). Researching such processes requires current techniques, long-term commitment, and stable funding. Such programs do exist in certain parks, such as the studies of wolves and moose at Isle Royale National Park,

but they are not the norm at NPS units for a variety of reasons. Information on climate change and its impacts, another subject that will require knowledge of multiple levels of organization, is also lacking for many parks. For approximately one-third of the parks, predictions of climate change impacts were not clear.

A summary of metrics for environmental quality (air, water, soils) also indicated the need for more information. The primary deficiencies with air quality are mentioned above; insufficient data for more obscure compounds that are not monitored by a national network, including chlorinated compounds and volatile organic compounds, were noted at over 70% of parks. A lack of water quality data is also noted above, but even basic water quality monitoring data, such as temperature, dissolved oxygen, and conductivity, were not found at 25–30% of parks. In order to sufficiently track water quantity, flow and diversion information are necessary, as discussed above, but it would also be helpful to understand other aspects of waterways such as discharge, drawdown, and, particularly for groundwater, recharge. Insufficient data were cited for these three metrics at 30–48% of parks. Finally, data on condition of soils were sparse, with the exception of information on erosion, compaction, and infiltration. Data on soil characteristics such as chemical and biological makeup were not available for 55–87% of parks.

Addendum (September 2010)

Since this paper was submitted in early 2009 to the National Parks Second Century Commission's Science and Natural Resource Committee for the preparation of its committee report, CSOTP has completed assessments of additional parks, bringing the total number of units assessed and scored for natural resources to 62. The Center for State of the Parks is currently bringing the data from all of its assessments together in a publication with the working title *The State of America's National Parks*, which will include analyses similar to those above along with further discussion of the issues faced by the park system and the efforts that are being made to address them. This publication will be released in the first half of 2011.

Gail Dethloff, National Parks Conservation Association, Center for State of the Parks, 503 Remington Street, #202, Fort Collins, Colorado 80524; gdethloff@npca.org

"An Orderly, Balanced and Comprehensive Panorama … of American History": Filling Thematic Gaps within the National Park System

John H. Sprinkle, Jr.

In 2009, the *Future Shape of the National Park System Committee Report* presented three important recommendations regarding the study of new units for the national park system as part of the work of the National Parks Second Century Commission. The ideal system must "adequately represent the American experience," "add important cultural themes not now well represented," and support "our constantly improving understating of the past, and the continuing progress of history." This report continues a long tradition of identifying the presence of "thematic gaps in the system" that must be addressed if the National Park Service (NPS) is to effectively and efficiently plan for "a system that works for all."[1] The origin and development of the national park system's thematic framework reveals a complex history of competing interests that presents both administrative and intellectual challenges if NPS is to implement the goals of the Second Century Commission.

In 1935, testifying before the Congress in support of the Historic Sites Act, Secretary of the Interior Harold L. Ickes argued that the proposals for a National Park Service survey of nationally significant historic sites would provide a foundation for a "unified and integrated system of national historical parks and monuments which, taken in their entirety, would present to the American people graphic illustrations of the Nation's history."[2] NPS historian Barry Mackintosh credits the idea of a thematic approach to historic site selection to the anthropologist and museum curator, Clark Wissler, who served as an advisor to the Department of the Interior from 1929 to 1947.[3] In 1929, reflecting his "culture area" approach to the classification of Native American groups, Wissler argued that "a selection should be made of a number of existing monuments which in their totality may, as points of reference, define the general outline of man's career on this continent."[4] With passage of the Historic Sites Act of 1935, the National Park Service was assigned the task of identifying those sites that possessed "exceptional value as commemorating or illustrating the history of the United States."[5]

During the late 1930s, NPS historian Verne Chatelain worked with other staff to develop the policies and procedures that would structure the Historic Sites Survey.[6] He noted

The George Wright Forum, vol. 27, no. 3, pp. 269–279 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

four important points about the inclusion of historic sites within the national park system:

- The system should include "all types of areas that are historically important in our national development."
- Previous selection of historic sites worthy of preservation had not been conducted according to any plan.
- Pressure from patrons and politicians influenced the choices made by federal government to acquire (or not to acquire) historic sites.
- It was "unsound, uneconomical and detrimental" to study individual sites "without reference to the entire scheme of things."[7]

In preparation for the first meeting of the National Park System Advisory Board in 1936, Chatelain set forth the specific criteria—"certain matchless or unique qualities"—possessed by nationally significant historic sites. "The quality of uniqueness exists:

- In such sites as are naturally the points or bases from which the broad aspects of prehistoric and historic American life can best be presented, and from which the student of history of the United States can sketch the large patterns of the American story; which areas are significant because of their relationship to other areas, each contributing its part to the complete story of American History.
- In such sites as are associated with the life of some great American, and which may not necessarily have any outstanding qualities other than that association; and
- In such sites as are associated with some sudden or dramatic incident in American history which, though possessing no great intrinsic qualities, are unique and which are symbolical of some great idea or ideal for the American people."[8]

Each property, then, was to be an individual piece of a national jigsaw puzzle that when assembled provided a comprehensive illustration of the American experience.

✺ ✺ ✺ ✺ ✺

Assisting the National Park Service in evaluating the significance of individual properties were the members of the National Park System Advisory Board, a group of citizens with expertise in history, archaeology, anthropology, and historical or landscape architecture, as well as the sciences. In theory, the board acted as a buffer between the particularistic desires of proponents for federal recognition of individual historic properties and the pragmatic reality of the limited capacity of the National Park Service to maintain and interpret its growing portfolio of historic sites. At its first meeting, NPS Director Arno B. Cammerer warned the Advisory Board: "there must be a sound basis in policy for withstanding this pressure" to recommend sites as being nationally significant.[9]

From the mid-1930s until the advent of the Mission 66 program the designation of historic sites as being nationally significant was both a sensitive and secret undertaking. The deliberations and recommendations of the Advisory Board were kept confidential and any

proposals for the establishment of national historic sites had to be approved by both the Bureau of the Budget and the president. During this period, the leadership of the Historic Sites Survey worked with the members of the Advisory Board to develop criteria for the evaluation of potential historic sites, which serve as the foundation of the standards used today by the National Register of Historic Places and National Historic Landmark programs. The criteria functioned (and continue to function) as a limitation on the consideration of certain types of properties, such as most commemorative or reconstructed sites, birthplaces and boyhood homes, cemeteries and other religious properties, moved buildings, and sites associated with the recent past. These official criteria were essential for the National Park Service to deflect the influence of "Criterion P," meaning the inescapable role of power, patronage, and politics in influencing the fundamentally political decisions to recommend the acquisition and establishment of new units of the national park system.

As the National Park Service emerged from World War II and embarked on the Mission 66 program, Chief of Interpretation Ronald L. Lee set forth the state of the agency's thematic approach to American history. With a portfolio of 123 historic properties, the Park Service was "engaged in a broad program to preserve historic sites, buildings and objects of national importance, illustrating all the major phases of American history." Lee saw substantial value in the work of the Historic Sites Survey: "Just as libraries and museums classify their collections to make them more useful and to guide future accessions, so the National Park Service has found classification of sites and buildings indispensable to their proper administration." Such a system of evaluation was necessary because Congress and other patrons continuously requested that the National Park Service review potential units: in 1954, for instance, NPS considered 72 sites, of which only two were considered eligible. Yet at the same time Lee recognized that "a comparison of present holdings with the 15 categories reveals serious gaps" in the National Park Service's ability to preserve and interpret sites that form the chapters of a comprehensive textbook of American history. From his perspective, Lee estimated that it would take a generation for the National Park Service to complete the "slow task of rounding out Federal holdings."[10]

From the mid-1930s until the mid-1990s, the National Park Service's survey of nationally significant historic sites was guided by a chronological and thematic framework which outlined major periods in American history. In 1936, to guide the work of the Advisory Board and the Historic Sites Survey, Chatelain put forward 12 prehistoric culture groups, principally geographic in orientation, and 23 historical themes, which followed a chronological framework. Due to funding constraints and the requirement that NPS staff prioritize the review of congressionally proposed properties, the progress of the survey was slower than expected. In the late 1930s, the Park Service estimated that a comprehensive survey of historic sites would take eight years of study and a $24,000 annual appropriation.[11] By 1943, 560 historic sites had been reviewed, of which 40% (n=229) had been classified as being nationally significant. Of these, only 18 (about 8% of the significant properties) had been designated as national historic sites. Some of these properties were under federal steward-

ship, others were protected through a cooperative agreement with a stewardship organization. More than 330 archaeological sites had been classified, with about 9% being considered of national importance.[12]

Just before many of the operations of the National Park Service were suspended by the advent of World War II, Fiske Kimball, one of the original Advisory Board members, personally compiled a list of nationally significant examples of American architecture within the original thirteen colonies. Director of the Philadelphia Museum of Art and a noted architectural historian, Kimball recalled that as the small National Park Service staff was "kept too busy reporting on single sites currently in question," a few members of the Advisory Board "took the initiative" to develop comprehensive lists of the most important sites in different fields. "I undertook a list of surviving buildings which could be regarded as of national significance—not only for events which took place there but equally for their artistic importance."[13] In late October 1941 the Advisory Board adopted Kimball's "Annotated List of Structures of Outstanding Architectural Merit."[14]

The difficult work of thematically identifying nationally significant historic properties was resuscitated with the Mission 66 program. As noted by Mackintosh, "reactivation of the Historic Sites Survey was proposed in the context of planning for the orderly rounding out of the National Park System." In the mid-1950s, Bernard DeVoto, an Advisory Board member, noted that although surveys for 11 of the 15 themes had been completed, four themes remained incomplete and barely understood.[15] "The [Mission 66] prospectus, describing the survey as 'approximately half completed' when terminated by the war, declared that it needed to be 'completed, brought up-to-date, and kept current.'"[16] To support completion of the survey, which the National Park Service estimated would take four years, the Advisory Board established a consulting committee for the National Survey of Historic Sites and Buildings and revised the thematic structure, combining historic and prehistoric properties into one framework. At the same time the secretary of the interior established "national historic landmarks" as a category of federal recognition that was the immediate and publicly accessible outcome of the work of the Historic Sites Survey. Because of the established criteria for national historical significance, recognition of a property as a national historic landmark is considered a prerequisite for consideration as a new historical park unit.[17]

As the end of the Mission 66 program approached, the federal survey of nationally significant historic sites remained unfinished, although in 1965 its accomplishments received praise from President Johnson.[18] In 1966, the National Historic Preservation Act expanded federal recognition of historic sites to include properties of local and state significance, illustrating the emphasis of the "new preservation" on aesthetic, environmental, and community values found in the recognition of historic places in contrast to the traditional focus on associative values. At the same time, NPS reorganized the Historic Sites Survey in recognition of the fact that a comprehensive survey of American history could never be completed. By one contemporary estimate, the architecture theme alone would require up to 11 years to update and complete.[19]

As the 1960s came to a close, Secretary of the Interior Walter J. Hickel repeated the goal, expressed periodically since the 1930s, that the National Park Service should protect and interpret the "best examples of … the important landmarks of our history" and that "there

are serious gaps and inadequacies which must be remedied while opportunities still exist if the System is to fulfill the people's need always to see and understand their heritage of history." The secretary directed the National Park Service to "continue your studies to identify gaps in the System and recommend to me areas that would fill them. It is my hope that we can make a significant contribution to rounding out more of the National Park System in these next few years."[20]

One result of this directive was *Part One of the National Park System Plan*, which set forth a restructured thematic framework that comprised nine themes, 43 subthemes, and 281 facets which were used to categorize American history. In the study, the National Park Service defined a "well rounded" system as being one in which all facets of the American history thematic framework were represented in one or more park units. Moreover, "regardless of the percentage of representation, no theme or sub theme is represented so long as a prime site, such as Mount Vernon or Valley Forge, remains outside the National Park System." As of 1970, the National Park System included 163 historical units, which represented only 30% of all the identified facets of American history.[21]

Having participated in the analysis of how well the units of the national park system reflected the full range of American history, the Advisory Board endorsed the results and recommendations of the study. In June 1970, Secretary Hickel moved quickly to ensure that the study could not be "misconstrued as approval of any program to acquire specific sites." He was deeply concerned that the report's recommendation that nearly 200 major facets of American history were unrepresented in the park system "could lead to the erroneous conclusion, possible even in Congress, that we now have plans to take over administration of Mount Vernon plus 196 other historical sites." For at least one theme, intellectual currents within a contemplative society, the secretary questioned whether the park system was a "valid … place for interpreting this theme at all."[22] This 1970 report represents the most recent comprehensive analysis of how well the national park system recognizes, preserves, and interprets places associated with nationally significant persons, events, trends, and culture in our collective history, and was cited by the analysis of the Second Century Commission.[23]

The National Park Service's role in the thematic study of places highly significant in American history was again institutionalized in the early 1980s with the publication of 36 CFR Part 65, the federal regulations that govern the operation of the National Historic Landmarks Program. The regulations state that potential national historic landmarks "are identified primarily by means of theme studies and in some instances by special studies" of individual properties.

> NPS defines and systematically conducts organized theme studies which encompass the major aspects of American history. The theme studies provide a contextual framework to evaluate the relative significance of historic properties and determine which properties meet National Historic Landmark criteria.[24]

The regulations also provided how the National Park Service prioritizes preparation of theme studies and special studies for historic properties outside of active theme studies. The

thematic framework referenced in the regulations is found in *History and Prehistory in the National Park System and the National Historic Landmarks Program*.[25]

As a result of a congressional directive in 1991, the National Park Service worked with the Organization of American Historians to develop a "significant departure" from previous thematic frameworks (Figure 1). *History in the National Park Service: Themes and Concepts* (1994) represented a "completely rethought, revised thematic framework" which identified eight concepts that reflect a "less compartmentalized approach to American History." Described as "less restrictive" than previous versions, the revised thematic framework "emphasizes the process of how to study history, but does not identify what to study." Specific topics for theme studies and site-specific special studies would continue to be identified via congressional mandate, NPS planning needs, and the judgment of NPS staff. The revised thematic framework was also recommended for use by existing park units to include and expand "themes for which individual parks were not originally specifically designated" by Congress.[26]

The 1998 National Parks Omnibus Management Act established the current process for identifying and authorizing studies of new units of the National Park System. Over the last

Figure 1. National Park Service Thematic Framework, 1994.

decade, the National Park Service has declined to make recommendations to Congress regarding the study of new units, as mandated in the act, principally because Congress itself has encumbered the National Park Service with numerous special resource study mandates. Since 2001, the National Park Service has recommended against establishing new historical units of the National Park System about 75% of the time, with five units being recommended at the completion of a special resource study. As Ronald Lee noted in 1954, "many are called, but few are chosen."[27]

One result of the administrative changes made during the 1990s to the way potential new national parks are evaluated and recommended to Congress is that the National Park Service again finds itself in "haphazard" situation, as in the mid-1930s, "without a thought to a general pattern emphasizing typical key sites."[28] In effect, over the last decade the National Historic Landmarks Program has had the legislative and regulatory mandate to conduct thematic studies, but not the funding, while the Park Planning Program has somewhat better access to funding but requires further congressional authorization to conduct theme studies. Left unclear is the role of the National Park System Advisory Board in the review of potential new park units. At present the Advisory Board's principal statutory mandate is in the recommendation of national historic landmarks, which, because of the criteria of national significance, is a critical step in the evaluation of new units of the national park system.[29]

One of the fundamental questions raised throughout the history of the National Park Service's thematic framework is: How can the Park Service develop a system of identification and evaluation to ensure that "sites reflecting the complexity of the American experience" are preserved and interpreted for the benefit of the American people? In the mid-1950s, Ronald Lee expressed the continuing goal of the National Park System to preserve "only outstanding examples in each class … so that Federal holdings emerge as an orderly, balanced and comprehensive panorama of principal sites and scenes of American history."[30] Lee's approach reflects a time when a broad consensus existed in the academic community, and among much of the public, regarding the most important themes in American history. As the historian Roger Launius recently noted: "Throughout most of American history, many Americans' conceptions of their past has been informed by views of nationalism, exceptionalism, and triumphalism."[31]

Since the mid-1960s, that consensus has broken down, at least among many academic historians, helping to generate a paradigm shift visible in the 1990s transformation of the National Park Service thematic framework. The rise of the "new preservation," with its emphasis on artistic, environmental, and diachronic qualities of historic districts (as opposed to traditional associative values found at particularistic historic sites) can be linked to the growth of "new social history" and the "battle for control of the national memory" where "revisionist history" is at the same time celebrated and denounced.[32]

How, then, in an environment where there is perhaps little general consensus about what patterns, persons, and properties are indeed worthy of federal protection, can the National Park Service hope to fulfill its mission to create "a system that works for all" while responding to

multiple congressional mandates to study and evaluate individual potential parks? The selection of a historic place to become a unit in the national park system is, in the broadest sense, a process of consensus-building; one that must ensure that new additions add substantial value to the system and are truly worthy of perpetual stewardship.

Review of the origins and development of the National Park Service thematic framework illustrates the continuous influence of patrons and politicians—factors known unofficially as "Criterion P"—that must be openly addressed by the National Park Service through the application of a robust and structurally sound process used in the identification and evaluation of new national historic landmarks and historical park units. As noted by Kimball, since 1935 the National Park System Advisory Board has struggled to harmonize the conflict between the pragmatic and "long-range views" of the National Park Service leadership and the "inconsequent opportunism" of particularistic site boosters wishing to influence the selection of new historical park units.[33]

A long-term view also reveals that a comprehensive survey of American historic sites will never be completed; each generation will add new units to the system, properties that, in fact, say as much about ourselves and how we view and value historic places as they do about the past. With more than 2,400 national historic landmarks currently designated, it is also clear that the National Park Service will never be the steward for most of the nationally significant historical sites. Within the context of the historical development of National Park Service's thematic framework, the Second Century Commission's recommendation for a "larger vision" that would identify "themes currently poorly represented" within the national park system is an important first step in the difficult process of creating a broad consensus about which nationally significant historic properties are, and which sites are not, "critical to preserving the national heritage."[34]

The views and conclusions in this essay are those of the author and should not be interpreted as representing the opinions or policies of the National Park Service or the United States government.

Endnotes

1. Denis P. Galvin, John Fahey, Belinda Faustinos, Gretchen Long, Jerry L. Rogers, and Margaret Wheatley, *Future Shape of the National Park System Committee Report: A System that Works for All* (Washington, D.C.: National Park Service Second Century Commission, 2009). See also Richard West Sellars, "The National Park System and the Historic American Past: A Brief Overview and Reflection," *The George Wright Forum*, vol. 24, no. 1 (2007) pp. 8-22; and Janet A. McDonnell, "Reassessing the National Park Service and the National Park System," *The George Wright Forum*, vol. 25, no. 2 (2008), pp. 6–14.
2. Hearings before the Committee on the Public lands, House of Representatives, Seventy-Fourth Congress, First Session, on H.R. 6670 and H.R. 6734. April 1, 2, and 5, 1935 (Washington, D.C.: Government Printing Office), statement of Secretary of the Interior Harold L. Ickes, p. 5.

3. Barry Mackintosh, *The Historic Sites Survey and National Historic Landmarks Program: A History* (Washington, D.C.: National Park Service, 1985), pp. 7–12.
4. *Reports with Recommendations from the Committee on Study of Educational Problems in National Parks*, January 9, 1929, and November 27, 1929 (Washington, D.C.: Department of the Interior), p. 24 (quoted in Mackintosh, *Historic Sites Survey,* p. 8).
5. Historic Sites Act of 1935, as amended, 49 Stat. 666, 16 U.S.C. 461–467. From 1935 until the establishment of national historic landmarks as a category of federal recognition in 1960, the National Park Service's survey identified potential candidates for designation as national historic sites.
6. Charles B. Hosmer, Jr., "Verne Chatelain and the Development of the Branch of History of the National Park Service," *The Public Historian*, vol. 16 (winter 1994), pp. 24–38.
7. Memorandum dated December 12, 1932; Mackintosh, *Historic Sites Survey,* p. 8. Quoted in Harlan D. Unrau and G. Frank Williss, *Administrative History: Expansion of the National Park Service in the 1930s* (Denver: National Park Service, 1983), pp. 164–165.
8. Verne E. Chatelain, "Suggested Statements of Principles and Standards Involving National Historical Areas." Attached to "A National Policy for Historic Sites and Monuments," National Park System Advisory Board Meeting Minutes, Washington, D.C., February 13–14, 1936. These three criteria were put forth by the National Resources Board's "Report on the Development of the Nation's Recreational Resources" (submitted December 1, 1934) and reprinted in J. Thomas Schneider, *Report to the Secretary of the Interior on the Preservation of Historic Sites and Buildings* (Washington, D.C.: Department of the Interior, 1935), pp. 2–3.
9. Members of the Advisory Board took seriously their charter that only the very best sites should be recommended for federal stewardship; as Chairman Waldo Leland noted: "I think we should encourage the disapproval of lesser things." Minutes of the First Meeting of the Advisory Board on National Parks, Historic Sites, Buildings and Monuments, Department of the Interior, Washington, D.C., February 13–14, 1936, pp. 31, 66, 72. National Park Service, National Historic Landmarks Program.
10. Ronald F. Lee, "The State and Federal Governments and Historical Restoration," draft paper, dated December 20,1954, presented to American Historical Association. p. 11; Library of Congress, Manuscript Division, Papers of Waldo G. Leland, Box 22. The recognition of historic places as "national historic landmarks" was established by the secretary of the interior in 1959.
11. Untitled paper in Historic Sites Survey File, quoted in Mackintosh, *Historic Sites Survey,* p. 19.
12. Mackintosh, *Historic Sites Survey,* p. 20.
13. Philadelphia Museum of Art Archives, Fiske Kimball Papers, Box 159, "Historic Monuments," p. 32.
14. Originally presented in 1938, Kimball's inventory was preliminarily adopted by the Advisory Board in 1940. "Dr. Fiske Kimball's Annotated List of Structures of Outstanding Architectural Merit," Minutes of the Eighth Advisory Board meeting, August 15–18,

1938. "Sites Classified as Eligible under Arts and Sciences in the Historic Sites Survey (List Presented by Dr. Fiske Kimball)," Minutes of the Thirteenth Advisory Board Meeting, October 28–30, 1940. "The Arts and Sciences, Architecture, (13 Original Colonies)," Minutes of the Fifteenth Advisory Board Meeting, October 28–30, 1941.

15. Mackintosh, *Historic Sites Survey,* pp. 32–33. The underdeveloped themes were: "Commerce, Industry & Agriculture to 1890"; "Means of Travel and Communication"; "Exploitation of Natural Resources to 1890"; and "The Arts and Sciences to 1870."
16. Mackintosh, *Historic Sites Survey,* p. 33, quoting "Mission 66: To Provide Adequate Protection and Development of the National Park System for Human Use," January 1956.
17. Mackintosh, *Historic Sites Survey,* p. 33–36.
18. Ibid., pp. 57–58.
19. Ibid., pp. 59–63. The quest for a comprehensive survey of historic sites continued into the Nixon Administration, which issued Executive Order 11593 in May 1971. This EO mandated that all federal agencies would "locate, inventory, and nominate … all sites, buildings, districts, and objects under their jurisdiction or control that appear to qualify for listing on the National Register of Historic Places" by July 1, 1973.
20. Secretary of the interior to director, National Park Service, "Management of the National Park System," June 18, 1969.
21. *Part One of the National Park System Plan: History* (Washington, D.C.: National Park Service,1972). Themes (e.g., "The Original Inhabitants") were defined as broad general groupings. subthemes (e.g., "The Earliest Americans") were considered the basic units of study, and facets ("Migrations from Asia") were important aspects of individual subthemes.
22. "Future of the National Park System," memorandum from chairman, Advisory Board on National Parks, Historic Sites, Buildings and Monuments, April 23, 1970, to secretary of the interior. "Advisory Board's April 23, 1970, Memorandum, 'Future of the National Park System,'" secretary of the interior to chairman, Advisory Board on National Parks, Historic Sites, Buildings and Monuments, June 10, 1970.
23. Galvin et al., *Future Shape of the National Park System Committee Report,* p. 2.
24. See 36 CFR Part 65. The national historic landmark regulations contain six criteria of significance, while the National Register of Historic Places Program has only four criteria.
25. National Park Service, *History and Prehistory in the National Park System and the National Historic Landmarks Program* (Washington, D.C.: NPS,1982; revised 1987).
26. National Park Service, *History in the National Park Service: Themes and Concepts* (Washington, D.C.: NPS, 1994; revised 2000).
27. National Park Service, *Criteria for New Parklands* (Washington, D.C.: NPS, 2005). NPS established criteria for national significance, suitability, and feasibility for use in studying potential new park units. National Park Service Authorized Studies (February 2010) contains information on the 20 special resource studies transmitted to Congress since 2001 as well as on 38 additional studies conducted by the NPS Park Planning and

Special Studies Division. See also Lee, "The State and Federal Governments and Historical Restoration." p. 10.

28. In 1936, National Park Service historians found themselves "involved in a planless [sic] situation" and struggled to formulate "tentative, experimental policies" that would govern the federal survey and the evaluation of historic sites. Minutes of the First Meeting of the Advisory Board, February 13–14, 1936, pp. 29, 32–33. National Park Service, National Historic Landmarks Program.
29. Cooperation between these two programs has produced multi-volume theme studies on the history of American civil rights that has led to the designation of several national historic landmarks, and has laid the foundation for the consideration of new park units. For example, see National Park Service, *Racial Desegregation in Public Education in the United States* (Washington, D.C.: National Park Service), 2000; *Civil Rights in America: A Framework for Identifying Significant Sites* (2002); *Civil Rights in America: Racial Desegregation of Public Accommodations* (2004); *Civil Rights in America: Racial Voting Rights* (2007).
30. Lee, "The State and Federal Governments and Historical Restoration." Lee served in a variety of leadership positions within NPS history programs from 1938 to the early 1950s.
31. Roger D. Launius, "Federal History and National Identity: Reflections from the Trenches" (the Roger R. Trask Award Lecture, 2009), *Federal History Online* (2010), p. 75.
32. Ibid., p. 76.
33. Philadelphia Museum of Art Archives, Fiske Kimball Papers, Box 159, "Historic Monuments," p. 32.
34. Galvin et al., *Future Shape of the National Park System Committee Report,* p. 2.

John H. Sprinkle, Jr., National Park Service, Federal Preservation Institute, 1849 C Street NW, Washington, D.C. 20240; john_sprinkle@nps.gov

Measuring Connections in the Sea: Pushing the Boundaries of Seascape Genetics at Channel Islands National Park

Crow White

The challenge of analyzing dispersal in the seascape

The exchange of individuals among populations through dispersal, or population connectivity, can profoundly influence the abundance and persistence of local populations (Simberloff and Wilson 1969). Population connectivity is influenced by environmental factors such as mountains, rivers, and habitat corridors that mediate the movement of organisms and the probability of their successful dispersal from one location to another. Understanding population connectivity and the role of environmental factors is critical for effective wildlife conservation and management.

Monitoring and mark–recapture experiments have confirmed our intuition and improved our understanding of how landscape features affect the movement of individuals and the probabilities of dispersal between populations for terrestrial species (Wiens 2001). In marine systems, it is more difficult to directly monitor the exchange of individuals among populations. Marine fish and invertebrates are especially problematic due to their production of microscopic larvae that disperse with ocean currents for days to months before settling onto reefs or other habitat and growing into adults. Challenges to estimating population connectivity in marine systems are further exacerbated by our limited knowledge about how the marine seascape influences dispersal. Ocean currents have complex patterns and features that disperse marine larvae, much like wind and weather patterns disperse airborne seeds on land, but there is far less continuous monitoring and documentation of these patterns in the ocean. Because of the difficulty of tracking marine larvae, and our limited understanding of the environmental factors influencing dispersal in the sea, the question of where larvae disperse, and consequently, the degree of connectivity among populations, remains largely unanswered (Cowen et al. 2000). This creates a significant challenge for the management of nearly every marine species.

Many marine ecologists have turned to population genetics as a tool for indirectly estimating population connectivity. Unfortunately, the complex genetic patterns among popula-

The George Wright Forum, vol. 27, no. 3, pp. 280–291 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

tions typically observed in marine systems often complicate conclusions regarding connectivity (Bradbury and Bentzen 2007). For example, a common genetic analysis looks for a positive relationship between geographic distance and genetic distinctiveness between sampled populations, with the idea that populations further separated in space exchange genes less frequently. In many cases, however, no clear relationship is found. This may result from complex environmental forces affecting population connectivity in non-linear ways, such as by blocking gene flow between populations located near each other. Consequently, marine ecologists seeking to measure population connectivity and understand its underlying forces are moving beyond conventional genetic analyses based on geography and developing novel approaches for identifying the metaphorical mountains, valleys, and corridors of the sea that are influencing population connectivity among marine populations.

In the oceans, currents can be circuitous and oceanographic features like eddies and fronts can regulate dispersal of larvae. Two adjacent sites may rarely exchange larvae if located on different sides of an oceanographic front (Gilg and Hilbish 2003), and two distant sites may be well connected by a strong current between them (Mitarai et al. 2009). A model of these oceanographic features may help explain genetic patterns across the seascape that would not be expected based on the geographical distribution of sites. On large spatial scales, incorporating oceanographic information into genetic analyses has proved fruitful for estimating connectivity (e.g., Galindo et al. 2006). The practice has been coined "seascape genetics," and it borrows techniques from landscape genetics designed to test for environmental drivers of spatial genetic structure. Terrestrial landscape genetics has successfully quantified population connectivity at fine spatial scales as well, even when dispersal is high and genetic patterns are relatively uniform across populations (Clark et al. 2008). In contrast, seascape genetics has typically been limited to measuring population connectivity at coarse spatial scales and in association with prominent physical barriers (e.g., a narrow strait, deep channel, or prominent headland)—and only in species with low dispersal rates. Given the high dispersal potential in so many marine species, including most fishery species, a central challenge to generating useful estimates of marine population connectivity is to push the boundary of seascape genetics and uncover meaningful population genetic patterns that correspond with oceanographic conditions at spatial scales relevant to conservation and fisheries management.

Population connectivity in a marine national park

In this essay I highlight a recent study conducted by myself and others in Channel Islands National Park (CINP), offshore from Santa Barbara in southern California. This study substantially advances seascape genetics by using a model of oceanographic circulation to resolve fine-scale population connectivity from a seemingly chaotic pattern of genetic data (White et al. 2010). Involving an interdisciplinary team of marine ecologists, geneticists, and oceanographers, the study focused on a marine snail, Kellet's whelk (*Kelletia kelletii*; Figure 1), whose geographic range is centered in the kelp forest reefs within CINP (Figure 2). Kellet's whelk is an ecologically significant predator of other marine invertebrates (Halpern et al. 2006), and is preyed upon by octopus, sea stars, elasmobranches, and marine mammals. Although adult Kellet's whelks travel no more than a couple hundred meters over many

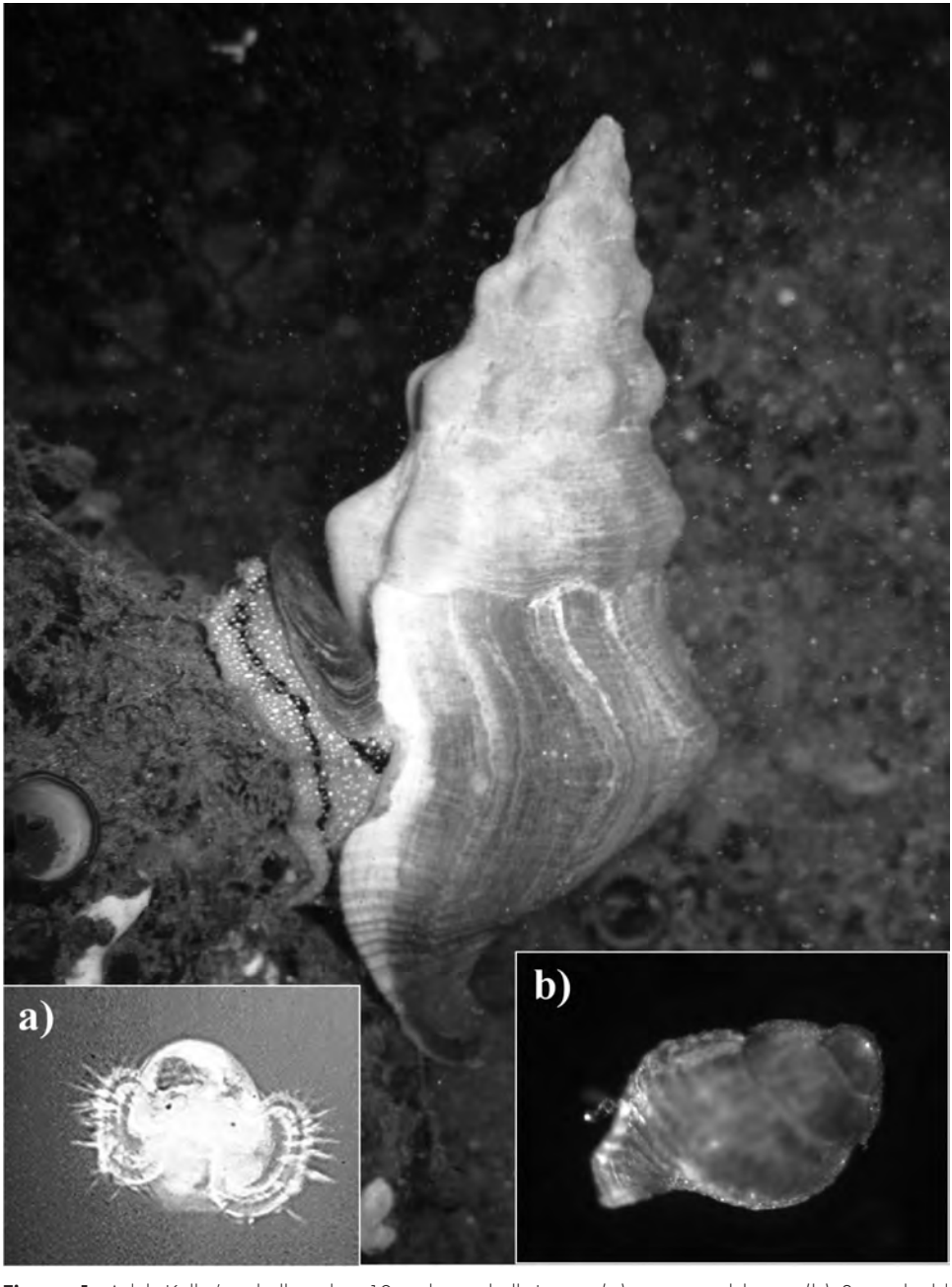


Figure 1. Adult Kellet's whelk with ~10-cm-long shell. Insets: (a) gastropod larva; (b) 3-month-old Kellet's whelk settler with ~1-mm-long protoconch shell. Photo credits: Ocean Institute Plankton Lab (a) and Sara Koch (b).

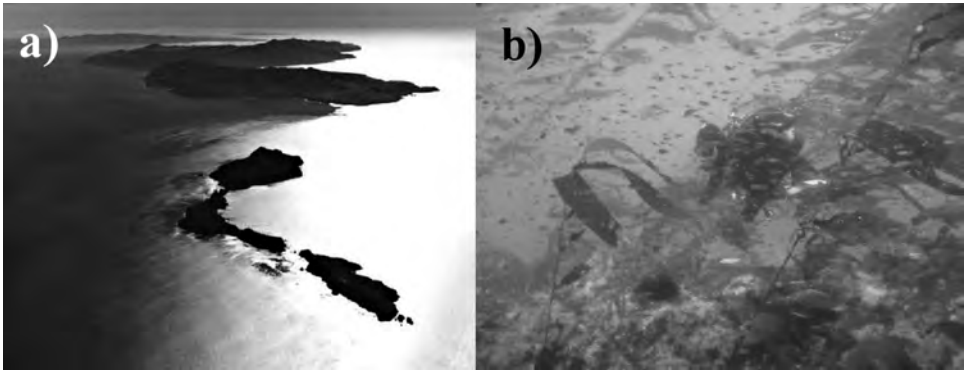


Figure 2. (a) Channel Islands National Park, looking West with Anacapa Island in the foreground . Channel Islands National Park is represented by five islands with ~300 km of coastline. (b) Research diver in a sub-tidal kelp forest. Photo credit: Channel Islands National Park (a).

years, the larvae they spawn every summer can travel great distances as they drift in the ocean for nearly two months before settling back onto reefs. Like most fish and invertebrate species, directly tracking the dispersal of these tiny larvae is logistically impossible.

Some Kellet's whelk populations are protected within no-take (i.e., no-fishing) marine reserves, which comprise approximately 23% of CINP's nearshore waters. Elsewhere in the park and in the surrounding Santa Barbara Channel region, commercial fishing of Kellet's whelk has increased exponentially over the last decade (Figure 3). Consequently, understanding the patterns of dispersal of Kellet's whelk larvae, and thus the degree of connectivity between Kellet's whelk populations in reserve and non-reserve areas, and between CINP and non-park waters, is important for guiding the conservation and management of this ecologically and economically significant species. More generally, patterns of population connectivity resolved for one species in CINP can help to guide the conservation and management of other, similar species. Lastly, demonstrating ocean circulation as an environmental factor driving larval dispersal and shaping population connectivity, especially at fine spatial scales, would provide a more general model for estimating connectivity in other regions and for other species.

For the Kellet's whelk seascape genetics research project, we analyzed DNA from whelks sampled at subtidal reefs in CINP and reefs along the adjacent Santa Barbara coastline (Figure 4). As is common among marine population genetic studies, we found the genetic differences among the sampled reef populations to be uniformly low and unrelated to geographic distance. That is, conventional spatial genetic analyses indicated no rhyme or reason to the observed genetic pattern. On their own, these results suggest that gene flow is high and random among the populations. However, we found a very different result after considering the genetic data in relation to ocean currents.

Using a model of ocean circulation produced from ocean temperature, salinity, current, and wind observations in the Santa Barbara Channel, we simulated dispersal pathways of virtual Kellet's whelk larvae, similar to tracking the movement of tiny particles in a simulated whirlpool. In the model, larvae were released along mainland and island nearshore waters

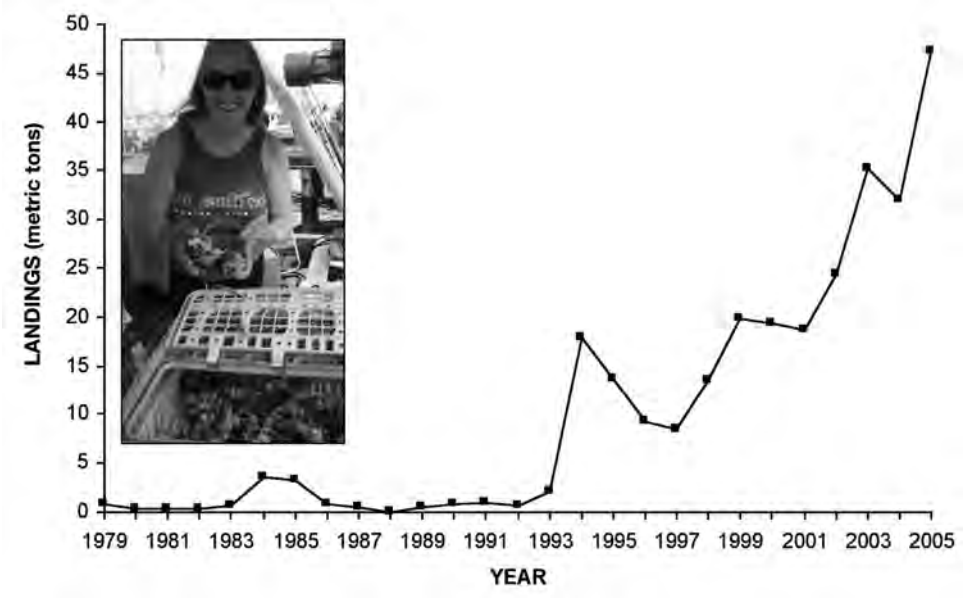


Figure 3. Southern California commercial landings of Kellet's whelk. Reproduced from Aseltine-Neilson et al. (2006). Inset: Vendor selling Kellet's whelk on the fishing pier in Santa Barbara.

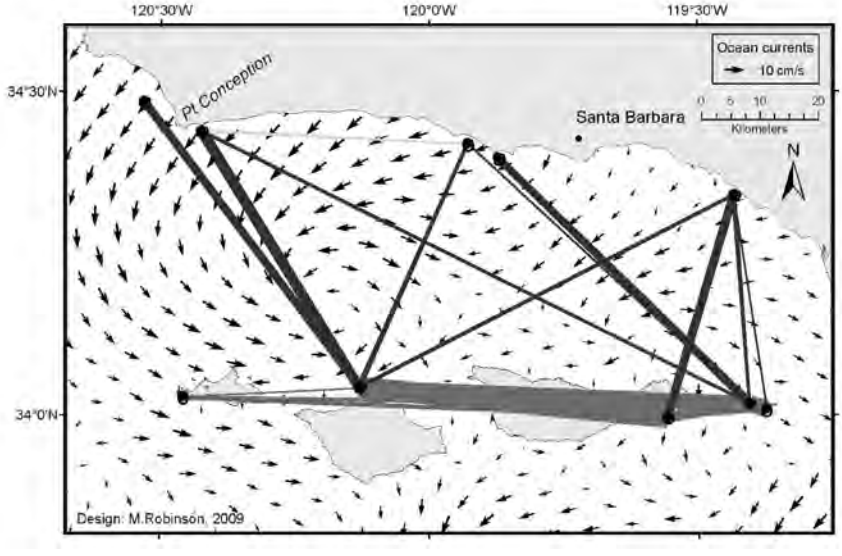


Figure 4. Map of Santa Barbara Channel region, overlaid with arrows indicating typical ocean circulation patterns, black dots ("nodes") indicating empirical genetic study locations, and straight lines ("spokes") indicating how likely, based on model simulations, Kellet's whelk larvae are to disperse between the different genetic study locations. Thicker lines indicate increased likelihood of dispersal between sites. Along the bottom half of the map, from left (west) to right (east), are Channel Islands National Park islands San Miguel, Santa Rosa, Santa Cruz, and Anacapa. Figure adapted from White et al. (2010).

where Kellet's whelk spawn, and the days of the year of their release and the number of days they were allowed to disperse in the model were set to match Kellet's whelks' natural spawning season and pelagic larval duration, respectively. Thus, the dispersal trajectories of the larvae were guided by their biological traits and the ocean currents carrying them (Figure 5). Based on the dispersal patterns exhibited by the simulated larvae, we calculated probabilities of larval exchange among the coastal locations in the model that matched the subtidal reef locations that we sampled in the field (Figure 4). We converted the probabilities of dispersal into relative oceanographic distances, and then compared these oceanographic distances with the observed pattern of genetic differences among Kellet's whelk populations. Unlike what was found in relation to geography, the comparison revealed a significant relationship between genetics and oceanography (Figure 6). Populations with the strongest

Figure 5. A "snapshot" of a simulation model of larval dispersal in the Santa Barbara Channel region. Land is indicated in gray, with Channel Islands National Park highlighted in light gray. In this illustrative example, larvae were released from the north shore of Santa Rosa Island, indicated by the star. Virtual larvae in the midst of dispersal and are represented by the dark circles; curved lines trace the dispersal path of each larva since their release. Note how most of the larvae were temporarily entrained in an oceanographic gyre (whirlpool) in the Santa Barbara Channel, then advected away by the southward-flowing California Current (see arrows in Figure 4). For visual clarity, only a fraction of the total larvae simulated in a formal analysis are shown here.

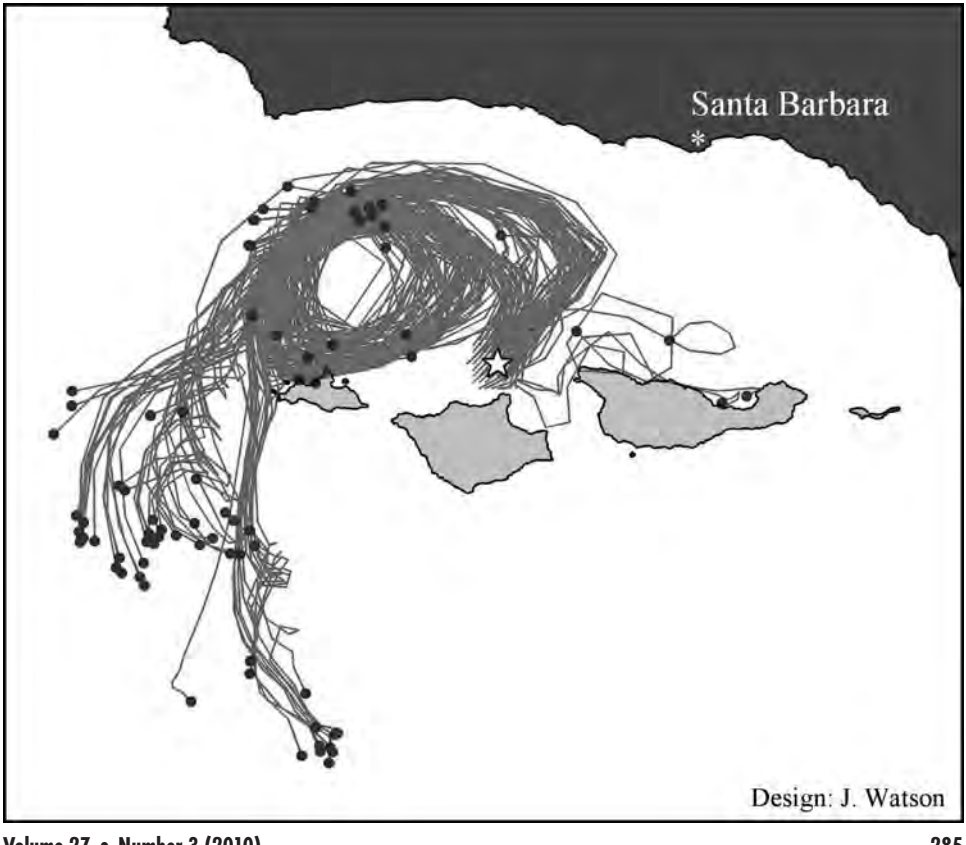


Figure 6. Genetic difference (pairwise FST) between sites in relation to the Euclidean distance between them based on (a) geography, and (b) oceanographic distance between them based on probabilities of simulated larval dispersal in a model of ocean currents. Figures adapted from White et al. (2010).

genetic differences had low probabilities of larval exchange and large oceanographic distances, and populations with the smallest genetic differences had high probabilities of larval exchange and small oceanographic distances. That is, the estimates of population connectivity based on genetics were nicely organized into a sensible pattern when viewed in relation to complex ocean currents.

Ecology and marine research implications

Sea- and landscape genetic analyses highlight the importance of considering dispersal from the perspective of the organism. In marine systems, the results from seascape genetic studies are developing into an increasingly clear message: that ocean circulation is an important environmental factor influencing dispersal, and thus population connectivity. Furthermore, ocean circulation patterns, thus larval dispersal trajectories, are far from well-mixed throughout a region. Consequently, in contrast to predictions based on conventional genetic analyses, neighboring populations are not necessarily genetically similar, nor are distant populations necessarily dramatically different. Instead, levels of connectivity between populations depend more on the currents than geographic distance between them. Marine mark–recapture studies have also already demonstrated that connectivity can be complex and not correlated with geographic distance for species with short (<2 weeks) larval dispersal periods (Planes et al. 2009), but these observations were not known to apply to the majority of marine species with long dispersal periods. The study on Kellet's whelk demonstrates that complex oceanographic conditions can generate such clear patterns of population connectivity even when marine larvae disperse for months.

A second, related message from seascape genetics studies is that oceanographic models, one of the few methods for simulating larval dispersal in marine systems, can be used for estimating population connectivity. The study on Kellet's whelk demonstrates the applicability of this message at fine spatial scales between populations less than tens of kilometers apart. This offers a useful shortcut for predicting connectivity. Population genetic studies require intensive field and laboratory work, are costly, and typically have to be repeated for every

species. And even after the work is complete, one is left with estimates of connectivity among only the locations where the researchers collected samples.

In contrast, using oceanography to estimate population connectivity requires large initial costs to gather data on oceanographic conditions and construct a circulation model; however, the ensuing costs of evaluating the dispersal trajectories of different species are relatively low, and estimates of connectivity can be generated among all coastal locations within the area represented by the model. The difference in research effort and cost associated with considering an additional site in a population genetic study (e.g., sampling individuals at the site, often using SCUBA, and analyzing their DNA in the laboratory), versus using oceanographic simulation (calculating frequency of larval exchange at that site in the model), is substantial. Consequently, there is great value in validating the use of oceanographic models for estimating patterns of larval dispersal at fine spatial scales in marine species with long pelagic larval dispersal periods, because it opens the door for marine ecologists to use this more cost-effective method for evaluating connectivity in countless marine species.

Implications for spatial management

Knowledge of population connectivity provides a fishery manager with the opportunity to strategically apply spatially explicit harvest regulations to further increase fishery returns (yields, profits) while still conserving high overall stock levels compared with those found under non-spatial management. Achieving such a win–win outcome can typically be achieved by following a simple rule of thumb characterizing harvest in relation to connectivity patterns among populations: locations that are larval sinks (i.e., areas of high larval settlement) are harvested more intensively, while locations that are larval sources (i.e., areas of high larval production and successful larval delivery to other locations) are protected from intense fishing. When an area is a particularly strong source of larvae, fishery returns may be maximized when it is closed to fishing entirely (Gaines et al. 2010). Identifying and conserving such high-output source areas not only requires an understanding by ecologists of larval dispersal and its effects on population connectivity, but also an appreciation by fishermen, managers, and policy-makers of the effect of population connectivity on population abundance and fishery yields.

California is in the midst of an intensive and controversial process to establish a series of no-fishing areas, called marine reserves, along its coastline. Guided by a state initiative, the Marine Life Protection Act (MLPA), the process engages scientists and stakeholders (e.g., fishermen) for designing a system of reserves that will rebuild and protect California's marine ecosystems, while minimizing the negative economic impact of the reserves on fisheries (or increase their benefit) (CDFG 2010). Marine reserve networks are inherently spatial management tools, and their design criteria (e.g., location, size, spacing, and configuration) determine their likely effectiveness. A core aspect of the MLPA is the establishment of multiple reserves along the coast that, due to larval dispersal, are anticipated to function as a connected network to conserve marine life and possibly enhance fishery returns more effectively than would individual reserves in isolation.

Achieving a "network effect" requires careful designing of the marine reserves in relation to the complicated source-sink pattern of larval dispersal in the region (Gaines et al.

2010). A key role of scientists in the MLPA is to evaluate the effectiveness of alternative marine reserve network proposals using bioeconomic models (CDFG 2010). In the models, reserve and non-reserve areas are all connected by larval dispersal, and larval dispersal patterns are estimated using oceanographic models of simulated larval dispersal, similar to what was done for the Kellet's whelk study. The models cover a variety of nearshore marine species; for most, there are no estimates of population connectivity using genetic or other empirical techniques, and for none are there empirical estimates of connectivity among all the populations along California's coast. Consequently, the MLPA scientists' ability to compare the effectiveness of the alternative marine reserve networks proposals hinges on the validity of using models of ocean circulation to simulate population connectivity. Furthermore, reserves proposed in the MLPA can be small (<1 km in length) and close together (<1 km from each other). Thus, confidence in projections of the effect of such a marine reserve network requires robust estimates of population connectivity at fine spatial scales. Results from previous seascape genetics studies, and in particular the Kellet's whelk study, represent substantial progress towards that goal.

In southern California, no new reserves will be placed in CINP; however, the location and characteristics of the thirteen existing marine reserve and conservation areas in the park are being explicitly accounted for in the design of reserves elsewhere. For example, low population connectivity between nearshore areas along the mainland in southern California and those around CINP's westernmost island, San Miguel (see Figure 4), indicates that conservation of fish stocks in the existing marine reserves around that island will contribute little to the network effect in southern California. In contrast, conservation of stocks in the reserves on CINP's more eastern Santa Rosa, Cruz and Anacapa islands, which exhibit high population connectivity with mainland nearshore areas, is expected to contribute substantially to the network effect in southern California. Moreover, we found Santa Cruz and Anacapa Islands to be most strongly connected to nearshore areas in the eastern half of the Santa Barbara Channel (e.g., near the city of Santa Barbara), suggesting that their network influence will be most apparent with reserves positioned along that stretch of coastline.

In marshalling validated and cost-effective oceanographic approaches to estimating connectivity, and explicitly incorporating the connectivity outputs into the evaluation of alternative spatial management policies, the MLPA models are maximizing our ability to accurately and effectively guide the design of California's marine reserve network. No other marine reserve design process has been so rigorous in this regard, setting an important precedent for analytical methods to guide marine spatial management and policy.

Moving forward

Despite the remarkable advances made recently in seascape genetics, the humble truth is that we have merely skimmed the surface in terms of generating precise and accurate estimates of population connectivity. Future progress will be marked by improved simulations of dispersal in relation to oceanography and larval biology, as well as improvements in our ability to identify and explicitly consider all of the major environmental factors driving gene flow among marine populations.

Larvae are not passive particles drifting aimlessly in the sea. They occupy all depths of the water column, and the larvae of many species actively maintain themselves at specific depths (e.g., near the bottom) or exhibit vertical migratory patterns by swimming among different depths periodically during dispersal. Ocean circulation is also a three-dimensional (3-D) process. Coastal upwelling and downwelling, and stratification in response to temperature and chemistry, cause velocity and direction of horizontal (two-dimensional) flow to vary with depth, making a column of water analogous to a stack of conveyor belts oriented in different directions and running at different speeds. From the perspective of a larva, where and when it positions itself on the stack of conveyor belts will influence its dispersal trajectory. Furthermore, larval survival while at sea varies depending on the availability of nutrients and the distribution of its predators, among other factors. Consequently, the dispersal path that a larva takes will influence its probability of survival and successful dispersal between locations. Improvements in our understanding of species-specific and spatially explicit vertical migratory swimming behaviors and mortality rates of larvae, and of the 3-D ocean circulation environment in which these dynamics occur, are necessary for more precise and accurate simulations of larval dispersal (Cowen et al. 2000; Marta-Almeida et al. 2006; Shanks 2009).

Unfortunately, recording swimming behaviors and daily survival rates of marine larvae in the wild over the course of their dispersal presents the same logistical challenges that prevent their direct tracking. Consequently, most estimates rely on laboratory observations. Measuring 3-D ocean flow, especially very close to shore, is also daunting, though progress on this front has been remarkable lately. Increases in computational power and algorithm efficiency are enabling oceanographers to estimate flow patterns at hourly intervals in relation to complex coastlines and bottom topography measured at the meter scale (Li et al. 2008). Consideration of such fine-scale model outputs of ocean circulation will vastly improve our ability to estimate population connectivity and the effectiveness of alternative management policies at the scale of individual reefs.

Even with perfect simulations of larval dispersal we are only left with an understanding of *potential* population connectivity. Actual, or realized, connectivity depends on the number of larvae spawned at each site, their condition (which affects their survival and swimming abilities), and the suitability of a settlement site for recruitment of larvae into juveniles (Watson et al. 2010). In Kellet's whelk, for example, average whelk size varies across the species range, and larger females produce more larvae. Also, in addition to ocean circulation, kelp cover has been found to help explain Kellet's whelk population genetic patterns, possibly regulating recruitment of settling larvae (Selkoe et al., in press). These biological and environmental factors were not considered in the Kellet's whelk seascape genetics study, thereby limiting its ability to tease apart their relative influence on realized population connectivity. Although some of these factors (e.g., habitat quality) are considered in the MLPA models, the underlying data (e.g., on bathymetry and substrate type) is spatially sparse and costly to obtain. Given limited resources, it is important to determine the value of gathering the data describing these factors. Such relative values of information can be quantified when these factors are explicitly compared with empirical patterns of genetic structure that reflect realized population connectivity. Identifying and focusing on the factors of greatest explana-

tory power will promote efficient construction and parameterization of models of connectivity for the most number of nearshore marine ecosystems.

Seascape genetics is a rapidly developing field that is substantially advancing our ability to measure population connectivity in relation to the marine environment. Marine larval dispersal—long considered the "black box" of marine ecology—is being unlocked by results and scientific tools arising out of seascape genetics. In opening this box, we are gaining an understanding of and appreciation for the complex patterns of population connectivity in the oceans, and contributing significantly to ongoing efforts to conserve and efficiently manage the ocean's valuable biological resources.

References

Aseltine-Neilson, D., B. Brady, M. Connell, P. Kalvass, L. Laughlin, B. Leos, J. Mello, G. Neillands, E. Roberts, I. Taniguchi, A. Vejar, R. Watanabe, and C. D.F. Game. 2006. Review of some California fisheries for 2005: Coastal pelagic finfish, market squid, Dungeness crab, sea urchin, abalone, Kellet's whelk, groundfish, highly migratory species, ocean salmon, nearshore live-fish, Pacific herring, and white seabass. *California Cooperative Oceanic Fisheries Investigations Reports* 47, 9–29.

Bradbury, I.R., and P. Bentzen. 2007. Non-linear genetic isolation by distance: Implications for dispersal estimation in anadromous and marine fish populations. *Marine Ecology–Progress Series* 340, 245–257.

CDFG [California Department of Fish and Game]. 2010. Marine Life Protection Act Initiative. Online at www.dfg.ca.gov/mlpa.

Clark, R.W., W.S. Brown, R. Stechert, and K.R. Zamudio. 2008. Integrating individual behaviour and landscape genetics: the population structure of timber rattlesnake hibernacula. *Molecular Ecology* 17, 719–730.

Cowen, R.K., K.M.M. Lwiza, S. Sponaugle, C.B. Paris, and D.B. Olson. 2000. Connectivity of marine populations: Open or closed? *Science* 287, 857–859.

Gaines, S.D., C. White, M.H. Carr, and S.R. Palumbi. 2010. Designing marine reserve networks for both conservation and fisheries management. *Proceedings of the National Academy of Sciences of the United States of America.* Online at www.pnas.org/content/107/43/18286.full.

Galindo, H.M., D.B. Olson, and S.R. Palumbi. 2006. Seascape genetics: A coupled oceanographic-genetic model predicts population structure of Caribbean corals. *Current Biology* 16, 1622–1626.

Gilg, M.R., and T.J. Hilbish. 2003. The geography of marine larval dispersal: Coupling genetics with fine-scale physical oceanography. *Ecology* 84, 2989–2998.

Halpern, B.S., K. Cottenie, and B.R. Broitman. 2006. Strong top-down control in southern California kelp forest ecosystems. *Science* 312, 1230–1232.

Li, Z.J., Y. Chao, J.C. Mcwilliams, and K. Ide. 2008. A three-dimensional variational data assimilation scheme for the regional ocean modeling system. *Journal of Atmospheric and Oceanic Technology* 25, 2074–2090.

Marta-Almeida, M., J. Dubert, A. Peliz, and H. Queiroga. 2006. Influence of vertical migra-

tion pattern on retention of crab larvae in a seasonal upwelling system. *Marine Ecology–Progress Series* 307, 1–19.

Mitarai, S., D.A. Siegel, J.R. Watson, C. Dong, and J.C. McWilliams. 2009. Quantifying connectivity in the coastal ocean with application to the Southern California Bight. *Journal of Geophysical Research–Oceans* 114.

Planes, S., G.P. Jones, and S.R. Thorrold. 2009. Larval dispersal connects fish populations in a network of marine protected areas. *Proceedings of the National Academy of Sciences of the United States of America* 106, 5693–5697.

Selkoe, K.A., J.R. Watson, C. White, T. Ben-Horin, M. Iacchei, S. Mitarai, D.A. Siegel, S.D. Gaines, and R.J. Toonen. In press. Taking the chaos out of genetic patchiness: Seascape genetics reveals ecological and oceanographic drivers of genetic patterns in three temperate reef species. *Molecular Ecology*.

Shanks, A.L. 2009. Pelagic larval duration and dispersal distance revisited. *Biological Bulletin* 216, 373–385.

Simberloff, D.S., and E.O. Wilson. 1969. Experimental zoogeography of islands: The colonization of empty islands. *Ecology* 50:278–296.

Watson, J.R., S. Mitarai, D.A. Siegel, J.E. Caselle, C. Dong, and J.C. McWilliams. 2010. Realized and potential larval connectivity in the Southern California Bight. *Marine Ecology–Progress Series* 401, 31–48.

White, C., K.A. Selkoe, J. Watson, D.A. Siegel, D.C. Zacherl, and R.J. Toonen. 2010. Ocean currents help explain population genetic structure. *Proceedings of the Royal Society B-Biological Sciences* 277, 1685–1694.

Wiens, J.A. 2001. The landscape context of dispersal. In Dispersal. J. Clobert, E. Danchin, A.A. Dhondt, and J.D. Nichols, eds. Oxford: Oxford University Press, 96–109.

Crow White, Marine Science Institute, University of California–Santa Barbara, Santa Barbara, California 93106; crowsfeather@gmail.com

Smokey Says, "Get Your Ash Off My Beach": Implementing a Smoke-free Beach Policy at Whiskeytown National Recreation Area

Jim Milestone, Nathan Read, and Louis Jarvis

Introduction

A BEAUTIFUL MOUNTAIN LAKE WITH WHITE SANDY BEACHES serves as a relaxing haven for 800,000 annual visitors at Whiskeytown National Recreation Area. The National Park Service tries to provide a high-quality visitor experience with lifeguards, a crime-free beach environment, clean restrooms, concessionaire services, and a swimming area protected from motor boats. Like any beach area, litter is always an issue and the four large swimming beaches at Whiskeytown Lake have their share. Cigarette butts are common in the sand, but Whiskeytown beaches fall short of being described as ashtrays, unlike some other beaches throughout the United States.

People visiting national park sites generally expect their stay to be a healthy—often a healing—experience for the body and soul. The park's beach users are mostly mothers with children who find the designated swimming beaches ideal places to recreate throughout the summer season. Secondhand smoke is common in outdoor areas where large crowds of the public congregate. This is especially true in Shasta County, where smoking rates are around 16.8% of the adult population, higher than California's state average of 13.8%.

During the spring of 2009, the Shasta County Public Health and Human Services department requested park management to consider a smoking ban at Brandy Creek Beach, the most popular public swimming beach at Whiskeytown (Figure 1). At the time, the park's management team was engaged in making other decisions of public interest and decided it best to put this proposal off for a year. In the fall of 2009, talks began with the Shasta County Tobacco Education Coalition and Shasta County Public Health to introduce the public to the idea of implementing a smoke-free policy at Whiskeytown.

On May 1, 2010, the park superintendent wrote a memorandum to the Park Compendium establishing the four designated swimming beaches at Whiskeytown as "smoke-free." This included the use of medicinal marijuana, which is prohibited by federal law, as well as smoking tobacco products.

The George Wright Forum, vol. 27, no. 3, pp. 292–302 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

Figure 1. Brandy Creek Beach at Whiskeytown National Recreation Area.

Secondhand smoke and public health

Tobacco use remains the number one preventable cause of premature death in California and the United States as a whole (CDC 2009b). This is despite decades of research and education on the harmful effects of tobacco use. We now know that significant dangers exist in the 4,000 chemicals that have been identified in tobacco smoke (NCI 2007). At least 250 are known to be harmful, and 50 of these are known to cause cancer (NCI 2007). These dangers are confirmed by the Centers for Disease Control and Prevention (CDC), which estimates that tobacco use is responsible for more than 430,000 deaths per year among adults in the United States (about 20% of all deaths) (CDC 2009b). Furthermore, it is estimated that 53,000 deaths are due to secondhand smoke each year in the United States, approximately 6,000 of which occur in California (HHS 2006).

Involuntary exposure to secondhand smoke has been growing as a public health concern since the connection between smoking and heart disease was documented by the surgeon general in 1983 (CDC 1983). Since that time, decades of research on tobacco use and secondhand smoke have identified a number of additional chronic and acute health consequences. In 2006, a second report from the surgeon general analyzed such findings and found that scientific evidence supports several conclusions, including: secondhand smoke can cause sudden infant death syndrome and other health consequences in infants and children, exposure of adults to secondhand smoke has immediate adverse effects on the cardiovascular system, secondhand smoke causes coronary heart disease and lung cancer, and

there is no risk-free level of exposure to secondhand smoke since even low levels of secondhand smoke exposure can be harmful (HHS 2006). This report, combined with the growing research on secondhand smoke, led the California Air Resources Board (CARB) to designate secondhand smoke as a toxic air contaminant in 2006 (CEPA 2005). As a Class A carcinogen, CARB acknowledged that secondhand smoke may "cause or contribute to an increase in deaths or in serious illness or pose a hazard to human health, particularly children's health" (CEPA 2005).

Regularity of exposure to secondhand smoke has become a concern since scientific evidence has confirmed its dangers. In California, 56% of adults, 64% of adolescents, and 38% of children are currently being exposed to secondhand smoke (CEPA 2005). The health consequences of such exposure in California each year have devastating consequences. These include: more than 400 lung cancer deaths, more than 3,600 cardiac deaths, 31,000 episodes of asthma, 21 cases of sudden infant death syndrome, 1,600 cases of low birth weight in newborns, and more than 4,700 cases of pre-term delivery (CEPA 2005). In the United States, the impact of secondhand smoke becomes even more blatant. The CDC has found that an estimated 3,000 non-smoking Americans die of lung cancer, and more than 46,000 die of heart disease primarily because of exposure to secondhand smoke (CDC 2009b). Reducing exposure to secondhand smoke in California, and the rest of the United States, is one of the more effective ways to reduce these negative health outcomes.

California has a strong history of implementing policies and programs to change community norms around tobacco use. These policies and programs, in turn, have a positive impact on exposure to secondhand smoke. In 1989, California voters passed a 25 cent per pack tax on tobacco products and California became the leader in the smoke-free movement nationally and internationally (Fichtenberg and Glantz 2000). This was followed by the California Smoke-free Workplace Law (1995) that prohibited smoking from indoor workplaces, restaurants, and bars. These social norm changes create social pressures that encourage smokers to become nonsmokers, reduce the number of cigarettes smoked, and help former smokers remain smoke-free (Moskowitz et al. 2000).

The success of the tobacco control movement has resulted in measurable public health impacts, such as accelerated declines in cigarette smoking and tobacco related diseases in California (NCPB 2000). While 13.8% of Californian adults are current smokers (CDPH 2010), the CDC estimates that 20.6% of all adults in the United States currently smoke cigarettes (CDC 2009a). In California, this represents a 35% decline in smoking since the inception of the tobacco control program (CDPH 2010).

For those who choose not to quit, the movement has resulted in a significantly greater rate of decline in per capita cigarette consumption in California compared with the rest of the United States (Fichtenberg and Glantz 2000; Gilpin et al. 2006). Per capita reductions in California represent a 61% decline since the inception of the tobacco control movement (Fichtenberg and Glantz 2000). Furthermore, the movement has resulted in significant reductions in age-adjusted mortality from heart disease and lung cancer compared to the rest of the United States (Fichtenberg and Glantz 2000; CDC 2010). The rate at which lung cancer has declined in California is over three times the rate of the United States (CDHS 2007).

Overall, California residents are smoking less, quitting at a greater rate, and experiencing better health outcomes than much of the United States.

The impacts of declines in cigarette smoking on public health can also be measured in reductions in health care expenditures. Each year, we spend nearly $96 billion in medical expenditures in the United States to cover the health care costs from tobacco use (CDC 2009b), including $5 billion from exposure to secondhand smoke (Behan et al. 2005). Since the efforts to change community norms around tobacco use began in California, the state has saved over $86 billion in health care expenditures (Lightwood et al. 2008).

Tobacco policy trends in recreation areas

Continued research on secondhand smoke has revealed that being outdoors does not mean that secondhand smoke is safer. Levels of exposure to secondhand smoke outdoors are comparable to the levels of exposure indoors. A person near an outdoor smoker might inhale a breath that contains 50 times more toxic materials than if they were breathing near a nonsmoker (Stanford University 2010). With this understanding, more than 150 communities in California have taken steps to protect visitors in recreation areas, such as parks, beaches, sports venues, and trails (CCAP 2009). In fact, smoke-free beaches have become the standard in Southern California beach communities, where more than 100 miles of shoreline prohibit smoking (Figure 2).

Figure 2. Southern California beaches with smoke-free policies (Los Angeles County Department of Public Health, 2007).

California legislators have also taken an interest in the growing trend of smoke-free recreation areas. In 2009, a bill was introduced by the state Senate that prohibited smoking in state parks. After a successful campaign through the Senate and Assembly, the bill was vetoed by the governor in 2010, citing differences in political philosophy. It is likely that this bill will be re-introduced given the support it has generated from state and local leaders.

Since the development of policies and programs to change community norms around tobacco use in California, the desire for smoke-free policies has spread across the United States. As of 2010, over 3,100 municipalities in the United States have local laws in effect that restrict where smoking is allowed, including 1,215 that restrict smoking in public outdoor places such as parks and beaches (ANRF 2010). These numbers continue to increase rapidly.

"Premier park experience"

For the past ten years, park management at Whiskeytown National Recreational Area has promoted the park as an ideal place to exercise within a spectacular natural setting. The park promotes the concept that exercising at Whiskeytown is healthy and good for your mind, body and spirit. To further this concept, trails were extended to the park's four waterfalls, including the newly rediscovered Whiskeytown Falls. The spring runoff makes the falls a premier attraction for children's hikes during each year's Waterfall Week. In 2002, Whiskeytown banned the use of personal watercraft on Whiskeytown Lake and the park launched a free ranger-guided kayak program. Since 2002, over 15,000 people have participated in the kayak program, including romantic full-moon kayak tours. Mountain bikes are allowed on most of the park's backcountry trails, and large racing events draw in race participants from all over the Western states. Equestrian rides and competitions are held annually. Foot races, including the Whiskeytown Relays, attract more than 500 runners from Oregon and Northern California. Open-water swimming competitions and sailing regattas draw in participants from several Western states. Whiskeytown management has positioned the park to be open to friendly, family-oriented sporting events that are compatible with and appropriate to the policies and the mission of the National Park Service. Implementing a policy that discourages smoking and promotes protecting visitors from secondhand smoke is consistent with the park's promotion of physical exercise.

Collectively, these events create a market niche for Whiskeytown National Recreation Area as a premier location for human-powered recreation. While motorized wake boarding and water skiing are allowed, the park encourages team rowing, sailing, swimming, trail running, and equestrian sports. All of this is complimented by the natural setting of a picturesque lake (a dammed Bureau of Reclamation facility) surrounded by old growth, forest-covered mountains in the shadow of the peak of Shasta Bally (6,200 feet in elevation).

The goal is to provide a "premier park experience" for the visitor who comes to enjoy the natural environment. The beaches provide an immediate opportunity to relax and cool off from the 100-degree summer heat. The concept of smoke-free beaches complements the affinity of park management for athletic recreational opportunities and makes the park a more attractive destination to a larger number of visitors. The concept also furthers Shasta County's "Healthy Shasta" movement, which park managers support.

Public opinion counts

The Whiskeytown Smoking Policy Survey was administered during the summer of 2009 to gauge public sentiment regarding smoking and the possible institution of smoking restrictions at four popular public beaches. The majority of the surveys (94.3%) were administered at the designated swimming beaches in Whiskeytown National Recreation Area. A total of 435 surveys were completed, but 390 surveys (18+ age consideration) were used in the analysis.

The results of this survey were supportive of the proposed policy. First, the percentage of visitors estimated to be current smokers was small and similar to county statistics on adult smoking prevalence (Figure 3). Over three-quarters (76%) of Whiskeytown respondents did not report being current smokers. Second, a significant majority of the visitors (66.7%) were women with young children. It was apparent that Whiskeytown offered an inexpensive recreation activity for many families, and a smoke-free policy would reduce secondhand smoke exposure to the large numbers of families at the lake. Third, nearly 70% of visitors indicated being bothered by smoking in recreation areas. This was especially true of women, representing two-thirds of Whiskeytown visitors, who were bothered most of the time (77%).

Finally, the responses to the Whiskeytown Smoking Policy Survey demonstrated widespread support for the institution of a smoking ban at all four of Whiskeytown's designated swimming beaches (Figure 4). Support for the proposed ban was evident among both men and women, individuals of all ages, Shasta County residents and non-residents, and among those who visit Whiskeytown both rarely and frequently. Sixty-six percent of those surveyed supported the institution of a smoking ban at all four designated swimming beaches, while only 28% were opposed. More than twice as many people reported that they would visit Whiskeytown more often if there were a smoking ban versus those that reported they would visit less often or never. Additionally, survey participants often commented on cigarette litter.

Policy implementation

On January 20, 2010, park management announced that a public meeting would be held on February 24 at the city hall of Redding, California, to discuss a proposal to establish smoke-free beaches at Whiskeytown. Approximately 25 people attended and a 30-day public comment period followed. At the public meeting, two people opposed implementing the cigarette ban with the argument that this was the start of a pattern towards a "slippery slope of eliminating personal freedoms." The balance of the audience in attendance fully supported establishing smoke-

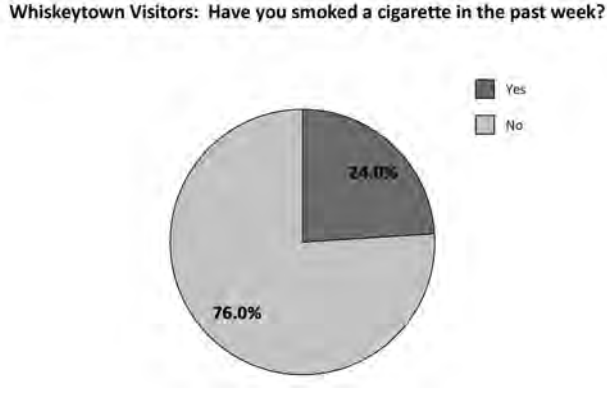


Figure 3. Percentage of current smokers measured by weekly cigarette smoking (Shasta County Public Health, 2009).

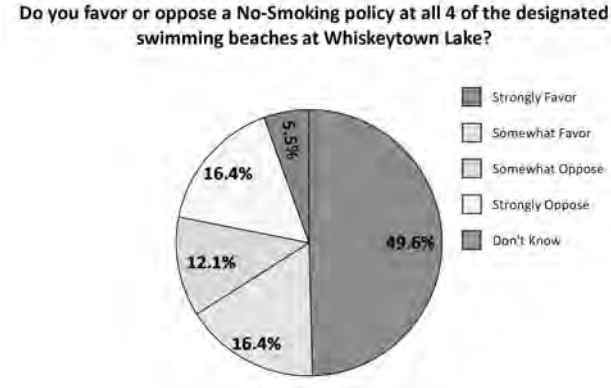


Figure 4. Response to the survey question, "Do you favor or oppose a No Smoking Policy at all 4 of the designated swimming beaches at Whiskeytown Lake?" (Shasta County Public Health, 2009).

free beaches and recognized the health concerns related to secondhand smoke. Local television and newspaper coverage generated an editorial and letters to the editor with mostly favorable support for making the beaches smoke-free. This followed a similar trend within Redding's city government to make the local public buildings and campuses smoke-free.

Local congressional offices were visited and briefings were prepared on the proposed policy by the superintendent. These briefings went well with general support for the proposal.

Public comments came in following the February public meeting. Most respondents were very supportive. Only a few letters of opposition were received out of some 60 letters regarding the proposed smoking ban. The author of only one of the letters opposing the measure identified themselves as a smoker and stated that "Whiskeytown was beautiful and a great place for a smoke!"

Implementation of smoke-free beaches began in earnest over Memorial Day Weekend in 2010. Signs were posted at each of the four beach entrances and smoking pots for cigarette butts were installed in the parking lots where people were allowed to smoke. Our local county supervisor, who generally supported the ban, requested that the designated smoking areas (parking lot sidewalks) would have a picnic table in a shaded spot so people who wished to smoke could relax and enjoy the park. This request was met and the smoking pots for cigarette butts were installed near picnic tables.

Throughout the summer, lifeguards and rangers occasionally contacted a person smoking on the beach and would ask him or her to either extinguish the cigarette or move to the parking lot area. While the park compendium established a citation of $50.00 for violators of the smoke-free policy, no citations were issued. This first summer season was primarily used as a season for educating the public that a smoke-free policy had been established. People who were seen by park staff smoking cigarettes were contacted and informed of the new policy. Overall, visitors supported the policy implementation and only a few incidents occurred with smoking visitors who protested that they had to extinguish their cigarette.

Visitor views: Three-month follow-up

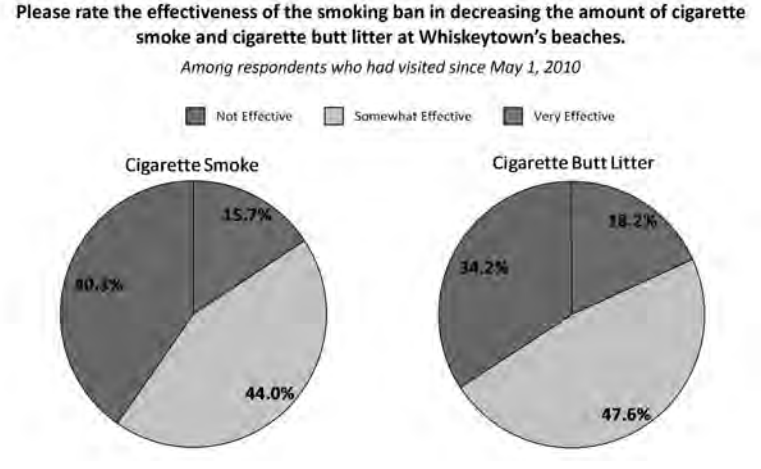
A post-implementation survey was conducted over the summer of 2010. The purpose of the post-implementation survey was to (1) collect data to gauge the level of awareness that park visitors had of the smoke-free policy, (2) determine if the policy was effective at reducing cigarette smoke and cigarette butt litter, and (3) conclude if sentiment towards the policy had remained favorable among visitors since the 2009 survey. The data collected by the survey answered these questions rather clearly.

As with the pre-implementation policy survey, a significant majority of visitors and survey respondents (72.3%) were females. Additionally, the visitor count data show that approximately 54% of the visitors affected by the smoke-free policy are children. This further supported the view that the smoke-free policy at Whiskeytown will reduce secondhand smoke exposure to the large numbers of families at the lake.

Only about a third of all respondents were aware of the smoke-free policy. This level of awareness can only be considered low and may have been due to the relatively short, three-month period between implementation and survey delivery. Additionally, more than two-thirds of survey respondents reported not seeing the "No Smoking" signs at each of the four designated swimming beaches. If measures are taken to increase awareness of the policy, the policy may become more effective at reducing cigarette smoke and cigarette butt litter. Such measures may include additional temporary signage, increased visitor contact with park staff, and visitor education through print materials and public service announcements.

Despite the low level of awareness of the smoke-free policy, a significant majority of respondents perceive the policy to be effective at reducing cigarette smoke and cigarette butt litter (Figure 5). If it is assumed that awareness of the policy will continue to increase with continued visitor education and time, it is likely that Whiskeytown will see continued reductions in secondhand smoke exposure and cigarette butt litter.

Figure 5. Response to the survey request, "Please rate the effectiveness of the smoking ban in decreasing the amount of cigarette smoke and cigarette butt litter at Whiskeytown beaches" (Shasta County Public Health, 2010).



Finally, support for the smoke-free policy increased markedly since the pre-implementation survey (Figure 6). In the 2010 survey, 83.3% of respondents report that they either "strongly favor" or "somewhat favor" the smoke-free policy, while in 2009, 66.0% of respondents favored the policy.

Conclusions

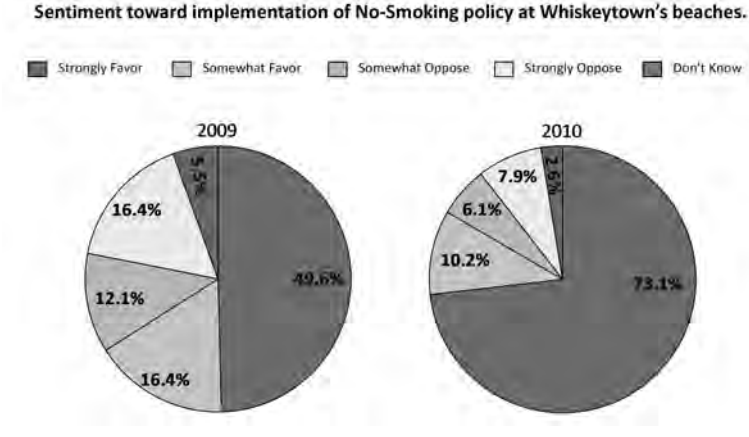
Whiskeytown National Recreation Area's management considers the implementation of the smoke-free policy a success. Overwhelming support for implementation of this policy was expressed by the public. While many of our local park visitors were unaware of the smoke-free campaign, awareness of the policy will continue to increase. With continued visitor education and time, it is likely that secondhand smoke exposure and cigarette butt litter will continue to decline at Whiskeytown.

Whiskeytown National Recreation Area's management made the conscious decision to go through a public process to debate the pros and cons of implementing this policy. Some of the visitors who came to the park in the summer had remembered hearing of this policy discussion. Managers believed the smoke-free policy was consistent with Whiskeytown National Recreation Area's push for outdoor athletic activities and physical exercise. From a public policy perspective, implementation of a smoke-free beach experience will provide people with a premier park experience. Visitors can enjoy the fresh air of the lake and surrounding forests that the National Park Service strives to protect through its mission to leave the area unimpaired for the enjoyment of future generations. We encourage other parks to implement outdoor smoke-free areas, and believe that, as we have seen at Whiskeytown, the public will support expansion of this policy in other park areas.

References

ANRF [American Nonsmokers' Rights Foundation]. 2010. *Overview List: How Many Smokefree Laws?* Berkeley, Calif.: ANRF.

Figure 6. Response to the survey question, "Do you favor or oppose a No Smoking Policy at all 4 of the designated swimming beaches at Whiskeytown Lake?" (Shasta County Public Health, 2010).



Behan, D.F., et al. 2005. *Economic Effects of Environmental Tobacco Smoke.* Society of Actuaries. Online at www.soa.org/files/pdf/ETSReportFinalDraft[Final%203].pdf.

CCAP [California Clean Air Project]. 2009. *California Communities Prohibiting Smoking/ Tobacco Use in Outdoor Dining, Parks, Beaches, and Sporting Venues.* Sacramento: ETR Associates.

CDC [Centers for Disease Control and Prevention]. 2009a. Cigarette smoking among adults and trends in smoking cessation—United States, 2008. *Morbidity and Mortality Weekly Report* 58:44, 1227–1232.

———. 2009b. Tobacco Use: Targeting the Nation's Leading Killer, 2009. Atlanta: CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

———· 2010. *Tobacco Control State Highlights, 2010.* Atlanta: CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

CDHS [California Department of Health Services]. 2007. *Cancer Surveillance Section, 2004.* Sacramento: California Department of Health Services, Tobacco Control Section. 2007.

CDPH [California Department of Public Health/California Tobacco Control Program]. 2010. *Adult Smoking Prevalence.* Online at www.cstats.info/ (accessed July 18).

CEPA [California Environmental Protection Agency]. 2005. *Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant*. Sacramento: California Air Resources Board.

Fichtenberg, C.M., and S.A. Glantz. 2000. Association of the California tobacco control program with declines in cigarette consumption and mortality from heart disease. *New England Journal of Medicine* 343:1772–1777.

Gilpin E.A., K. Messer, M.M. White, and J.P. Pierce. 2006. What contributed to the major decline in per capita cigarette consumption during California's comprehensive tobacco control programme? *Tobacco Control* 15, 308–316.

HHS [U.S. Department of Health and Human Services]. 1983. *The Health Consequences of Smoking: Cardiovascular Disease—A Report of the Surgeon General.* Publication no. (PHS) 84-50204. Washington, D.C.: Government Prinking Office.

———· 2006. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*, Washington, D.C.: Government Prinking Office.

Lightwood, J.M., A. Dinno, and S.A. Glantz. 2008. Effect of the California tobacco control program on personal health care expenditures. *PLoS Medicine* 5:8, e178.

Moskowitz, J.M., L. Zihua, and E.S. Hudes. 2000. The impact of workplace smoking ordinances in California on smoking cessation. *American Journal of Public Health* 90, 757–761.

NCI [National Cancer Institute] 2007. *Secondhand Smoke: Questions and Answers.* Bethesda, Md.: Public Health Service, National Institutes of Health.

NCPB [National Cancer Policy Board]. 2000. *State Programs Can Reduce Tobacco Use.* Washington, D.C.: Institute of Medicine.

Stanford University. 2010. Secondhand smoke at sidewalk cafes and other outdoor settings is still serious, according to scientists. *ScienceDaily*. Online at www.sciencedaily.com /releases/2007/05/070502181454.htm (accessed February 10).

Jim Milestone, Whiskeytown National Recreation Area, P.O. Box 188, Whiskeytown, California 96095; jim_milestone@nps.gov

Nathan Read, Shasta County Health and Human Services Agency (Public Health), 2650 Breslauer Way, Redding, California 96001; nread@co.shasta.ca.us

Louis Jarvis, Shasta County Health and Human Services Agency (Outcomes, Planning & Evaluation), 2650 Breslauer Way, Redding, California 96001; ljarvis@co.shasta.ca.us

The Le Conte Memorial Lectures and Park Interpretation—A Historical Account

Karen Merritt

> The Yosemite is not only a paradise for the lover of nature, but it contains materials of extraordinary scientific interest which may be interpreted for the public more satisfactorily by lectures given in the valley itself than by any other means.
>
> —*University of California Extension overview of Le Conte Memorial Lectures*

The history of interpretation programming in America's national parks is well-documented.[1] One contributor to this history has, however, been mentioned only in passing: the Le Conte Memorial Lectures offered in Yosemite Valley between 1919 and 1924 by the University of California (UC) Extension, the university's continuing and adult education division. This article will take a closer look at the role of the series in the context of creation of the Free Nature Guide Service in Yosemite in 1920. The Le Conte Memorial Lectures story is doubly revealing in considering how interpretation became a formal feature of national parks. First, it sheds light on how the Sierra Club's fostering of guided nature walks and informative campfire lectures during its annual outings connected via the Le Conte Lectures with park interpretation. Second, it serves as an early case study of the difficulties in sustaining a program dependent on partners with divergent interests. These difficulties would come in two forms: fiscal and educational.

UC faculty, alumni, and friends constituted the leadership of the Sierra Club from its 1892 founding through its first decades. When the National Park Service (NPS) was created in 1916, the university served as the old school tie between Sierra Club and Park Service leadership. Stephen Mather and Horace Albright shared the experience of undergraduate education at UC, as well as Sierra Club membership, with club leaders William Colby and Joseph N. Le Conte, both of whom stood ready to advise Mather and Albright on NPS issues. Goals in these early years were fundamentally the same, in that each organization sought to expand public knowledge of America's scenic treasures and, through that knowledge, build public advocacy for protection and expansion. The old school tie proved an informal link that brought to bear club activism on behalf of the NPS agenda.

The Le Conte Memorial Lectures briefly formalized the connections among the UC, NPS, and Sierra Club in the interest of public education. UC Extension developed the pro-

The George Wright Forum, vol. 27, no. 3, pp. 303–322 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

gram, engaged distinguished scientists as speakers, arranged honoraria, and provided an on-site staffer to oversee logistics. The Sierra Club provided a venue—its Yosemite Valley visitor information headquarters, the Le Conte Memorial Lodge, which it finished rebuilding in time for the commencement of the lectures, then improved with the addition of an amphitheater. NPS provided a second venue and increasingly engaged in soliciting direct support of lecturer expenses from the concessionaires and transportation companies. Yet this orderly listing of how responsibilities were divided does not begin to reveal the intricate interactions among the partners.

Concurrent with the Le Conte Lectures, a UC circle, centered on the Museum of Vertebrate Zoology and well-connected with UC Extension, developed the Free Nature Guide Service, the first officially constituted national park educational program. As the Guide Service proved its strong appeal to valley visitors, the Le Conte lectures were treated as a valued contribution to attracting the public. Both ventures grew out of a shared premise that, metaphorically, Yosemite represented a natural outdoor school that could both teach and inspire, by educating visitors to read "the sermons in stone, books in the running brooks."[2] The shared UC connections among the Nature Guide organizers and Yosemite's first park naturalist were evident as these individuals all contributed to solving unexpected problems faced by the Le Conte lecture staff. Yet these closely allied UC associates would part ways in defining how that public education should be carried out. As early as the beginning of 1918, when the Extension lectures committee proposed the Le Conte Memorial Lectures in Yosemite, the Extension Advisory Board initially resisted, doubting such a recreationally oriented setting was an appropriate one for a lecture series by prestigious scientists and other university faculty.

Inaugural plans for the Le Conte Memorial Lectures

In the spring of 1919, UC Extension introduced a plan for twelve Le Conte Memorial Lectures to be offered free of charge during June and July, primarily in front of the Sierra Club's Le Conte Memorial Lodge. According to the widely circulated brochure, "The lectures deal with the geology, botany, folk-lore and history of the Yosemite, and all will be illustrated by the magnificent scenic features which have gained world-fame for the giant gorge of the High Sierra. Surely, America can offer no finer 'outdoor school' than Yosemite.... While dealing in an authoritative way with scientific subjects, the lectures will be popular and not highly technical in character—seeking to interest as well as to instruct. The speakers are all men of recognized standing in their various fields." Lecturers included U.S. Geological Survey geologist François Matthes, in the midst of his ground-breaking research on the formation of Yosemite Valley and the High Sierra; Willis Linn Jepson, UC's distinguished botanist, whose *A Flora of California* and *The Trees of California* were definitive; William F. Badè, literary executor of the John Muir estate, professor of theology at the Pacific School of Religion in Berkeley, and, at that time, president of the Sierra Club; and Alfred L. Kroeber, UC's celebrated anthropologist. Each gave three lectures, respectively, on Yosemite geology, Sierra flowers and trees, John Muir's ideas and contributions, and Yosemite Indians. As will be seen, the Sierra Club provided much more than just a venue for these speakers.

Early Sierra Club contributions to public education in Yosemite

Three of the first four Le Conte Memorial lecturers—Matthes, Jepson, and Badè—had honed their considerable experience as public educators during the Sierra Club's annual backcountry outings. In the May 1900 *Sierra Club Bulletin*, Secretary William E. Colby made the first outing proposal, citing the success of the Mazamas and Appalachian Clubs in organizing member treks, but also setting apart the Sierra Club plan by suggesting educational aims. Colby encouraged prospective participants to read John Muir's *Mountains of California* and Joseph Le Conte's *Journal of Ramblings Through the High Sierras,*[3] and noted that both men would likely participate in the outing. Le Conte's *Ramblings* foreshadowed what Sierra Club members might expect. Written by UC's most celebrated scientist and beloved founding faculty member, *Ramblings* described an 1870 trip to Yosemite Valley and the Sierra high country in the company of a fellow faculty member, eight of the university's first 38 students, and, for part of the trip, John Muir. *Ramblings* included summaries of Le Conte's campfire lectures on the scientific phenomena that the party had seen during the day. Typically, he appealed to his listeners' sensory memory of what they had experienced during the day, then explained the science behind the natural phenomena. For the proposed 1901 outing, Colby solicited the participation of scientists from UC, Stanford University, and other institutions to offer campfire talks on the scientific phases of the trip. As Colby remarked, "This feature alone will make the trip an extremely desirable one."

The annual outings proved immensely popular, with parties of 200 or more members joining in each year. The educational focus continued. The 1915 outing announcement, for example, noted that a special feature of the trip would be campfires with lectures, stories, talks, music, and singing, drawing on the talents of outing participants. The announcement could confidently state that "interesting and instructive talks will be given by men of science familiar with the trees, flowers, birds, animals and geology of the region." Matthes, Jepson and Badè, an amateur natural scientist, had all been among those "men of science," not only giving guided walks and campfire talks, but publishing accounts of their discoveries in the *Sierra Club Bulletin*. In a word, what was fundamentally a social event designed to bind together the club membership in the interest of advocacy for Sierra preservation continued to have an educational purpose that set it apart from trekking in other American alpine clubs. Beginning in 1905, Stephen Mather was a drop-in participant during numerous Sierra Club outings. As early as 1912, at an outing during which Jepson guided walks and lectured at campfires, Mather gave his own campfire talk on national parks (Farquhar 1973, 177)—an auspicious choice of topic, given his subsequent career.

The Le Conte Memorial Lodge in front of which most of the inaugural Le Conte lectures were given had also made early contributions to public education. While Yosemite Valley was still under the jurisdiction of the state of California, the state oversight commission contracted with the Sierra Club to establish in 1898 a visitor information headquarters in an existing valley cottage. In 1903, the club raised funds to build a new headquarters adjacent to Camp Curry as a memorial to Joseph Le Conte, who had been a charter member and officer. Over succeeding years, custodians of the Le Conte Memorial Lodge would provide visitor information, host lectures and wildflower shows, and themselves give informative talks and guided walks. The lodge housed a herbarium and other museum-like displays, plus a

library. While other national parks hosted various and largely unofficial examples of guided walks, talks, museums, general information services, and publications, the Sierra Club was notable in pioneering the full suite of educational activities that would be formally piloted in Yosemite for NPS during the 1920s at Mather's instigation.

1919: A watershed year

The year in which the Le Conte Memorial Lectures were launched was seminal in the development of Park Service programming that started with the Free Nature Guide Service in Yosemite. Central to this effort was Stephen Mather. Recovered from a recent bout of illness and back at work as NPS director, Mather both lent his support to the Le Conte Memorial Lectures and spent the early summer personally recruiting the men who would pilot public education for NPS, all while preparing to resume his Sierra high country camping trips for influential men from politics, business and the media—a reprise of the Mather Mountain Party of 1915.

Meantime, the Sierra Club expressed support for Mather's plans for educational development in the parks by publishing in the January 1919 issue of the *Sierra Club Bulletin* the May 13, 1918 letter from Secretary of the Interior Franklin Lane to Mather, which included the following admonition:

> The educational, as well as recreational, use of the national parks should be encouraged in every practicable way. University and high-school classes in science will find special facilities for their vacation-period studies. Museums containing specimens of wild flowers, shrubs, and trees, and mounted animals, birds, and fish native to the parks, and other exhibits of this character will be established as authorized.

As Barry Mackintosh has chronicled, Congress was not prepared to fund such activities. The Park Service would depend heavily on external support, with a substantial element of volunteerism, to get education in the parks started. What NPS leadership could give was encouragement—and helping hands. Thus, UC Extension Assistant Director F.F. Nalder assured François Matthes that Mather "expressed his hearty sympathy with the Le Conte Memorial course and offered to make the assistance of the NPS available for it in every possible way."[4] Nalder also commented that the Sierra Club would provide special assistance in the form of publicizing the lectures.

Mather's promise was fully realized in 1919 and the years thereafter. In a subsequent letter (dated May 27, 1919) to Matthes, Nalder described Yosemite Superintendent W.B. Lewis's personal help in locating suitable venues, including making arrangements for lighting and seating facilities at the Le Conte Memorial Lodge and providing equipment for the illustration of lectures with slides. Further, Lewis gave assistance in publicity and saw to it that the road by the Lodge was clear of traffic while the lectures were in progress.[5] Horace Albright, working cooperatively with Nalder, arranged for NPS to help with transportation from El Portal to Yosemite Valley and living expenses in the valley for the lecturers and an on-site UC Extension coordinator.[6] By the end of the series, Nalder declared that "I think it may be said that the course was a pronounced success."[7] Lecture attendance usually ranged

from 200 to 425, with Badè's July 4 lecture on John Muir's service to the nation attracting 1,500.[8] Mather attended the July 12 Kroeber lecture, next to last of the Le Conte series, "and expressed a most cordial interest in the course."[9]

While the backcountry camping trip with men of influence was Mather's principal focus, his attendance at the Kroeber lecture and verbal support of the Le Conte "course" represented only the first phase in spearheading public education in Yosemite. Between two visits to the Sierra Club outing at Soda Springs in Tuolumne Meadows, Mather drove to Lake Tahoe where he had arranged to meet his distinguished camping trip recruits on July 20—and not incidentally, where he would act as recruiter of his own educators to initiate interpretive services in Yosemite.

He had as background for these activities correspondence from Joseph Grinnell, director of UC's Museum of Vertebrate Zoology; from Grinnell's enthusiastic friend of many years, Sacramento businessman C.M. Goethe, lately founder and promoter of the California Nature Study League; and at the National Research Council in Washington, D.C., the reinforcing advocacy of UC paleontology professor John C. Merriam, a long-time Grinnell colleague, beginning what would be a fifteen-year advisory role to promote educational programming in the parks. In a letter to Mather dated June 6, 1919, Grinnell posed the idea of a resident naturalist, a position that he had first suggested toward the end of a 1916 *Science* article (Grinnell and Storer 1916, 379). To launch such a position, he recommended his colleague Harold C. Bryant and Loye Holmes Miller of the State Normal School in Los Angeles, both of whom he and Merriam had supervised during their doctoral degree work. On June 12, 1919, Merriam wrote to Grinnell that he had received a copy of the June 6 letter to Mather, noting that it had come "at a good time as I know that Mr. Mather and Mr. Albright are greatly interested in the development of scientific and education work" in the parks. With plans to see the two shortly, Merriam promised to speak to them about Grinnell's idea.

The UC careers of Grinnell and Merriam had been intertwined by research circumstances and a shared outlook on public education. Both were dedicated field scientists befitting the university's strong tradition of description and systematics. Grinnell was an ornithologist and mammalogist whose work included wildlife studies, among which was the first comprehensive Sierra wildlife assessment in a transect that included Yosemite National Park. Merriam was a paleontologist, the first to bring that field of study to bear on a variety of sites in the American West. Both searched for the overarching interconnectedness of living things, present and past. Both were animated by the well-established image of nature as a book to be read and understood through the tools of field science. Reflecting the strong preference of Grinnell and Merriam for learning directly from nature, Bryant, Miller, and Ansel F. Hall, Yosemite's first ranger-naturalist, would build programs that favored field-based over institutional learning and that encouraged visitors to appreciate the interconnections among the phenomena that they were seeing. In their subsequent positions in the NPS hierarchy, Bryant and Hall would carry this approach to interpretation into the entire national park system.

Merriam's research patron, Annie M. Alexander, recruited Grinnell to found the Museum of Vertebrate Zoology, which she underwrote, in 1908. In 1909, Grinnell established a

lecture series, open to the public, to showcase the museum's research results; and Merriam was instrumental in establishing a universitywide distinguished researcher lecture series for the general public. In recruiting future UC president W.W. Campbell as a lecturer, Merriam offered his view of what constituted an appropriate lecture for the general public: the lecturer should present results of his recent original research in the simplest possible form consistent with a satisfactory statement of evidence.[10] In Merriam's view, the national parks presented "an extraordinary venue for adult education." (Mark 2005, 23) The Le Conte Memorial Lectures mirrored a philosophy of taking research to the public that Grinnell and Merriam had fostered in earlier years, and it is not surprising that both were recruited for stints as Le Conte lecturers.

Another shared philosophy centered on the role of museums in public education. For both, public lectures conveying up-to-date scientific knowledge should be backed up by well-designed museums, though it should be noted that the Museum of Vertebrate Zoology was designed for researchers rather than the general public. In the public realm, Grinnell and Merriam were variously involved in the affairs of the California Academy of Sciences and the Oakland Museum. During that watershed year of 1919, they worked together to promote Albright's and Mather's interest in national park museum development. Grinnell conducted Albright through the California Academy of Sciences exhibits, expounding his philosophy of what national park museums should be and do.[11] Merriam promised to urge Mather to take a similar tour with Grinnell.[12] Museums were a central feature of the interrelated suite of public education services that Bryant, Miller, and Hall would pilot in Yosemite and elsewhere in the park system. Under the mentorship of Grinnell and Merriam, Bryant, Miller, and Hall brought scientific and research expertise that expanded the scope and raised the professionalism of these services. The Yosemite museum would serve as a headquarters for the growing public education programming in Yosemite, and Grinnell and Merriam would continue to give material assistance to this effort in other national parks as well as Yosemite.

On June 27, 1919, Mather sent a warm response to Grinnell's proposal for a resident naturalist, finding it a splendid idea to have scientific information disseminated among visitors to replace the current haphazard communications. Mather promised to consult with Assistant Director Albright on the red tape, observing that civil service approval might be required. It was, and by the time Mather met Bryant, the position had been approved.[13]

Between July 19 and 21, Mather made contact with both Bryant and Miller. Mather had been urged by Goethe to meet Bryant at Lake Tahoe, where he was experimenting with a program of evening talks and guided daytime walks at several area resorts under the joint auspices of the California Fish and Game department and the California Nature Study League, repeating a program that he had tried out in Yosemite the year before. Mather asked Bryant to go at once to Yosemite and start something like the Tahoe program (Bryant and Drury 1964, 7ff.). Initially, Bryant refused and referred Mather to Loye Miller, who was camping with his family near the lodge at Fallen Leaf Lake. The lodge owner invited campers to give impromptu talks during evenings and Miller recollected that Mather overheard him there doing a talk which featured imitation of bird calls. Mather followed up with a telephone call and meeting, asking Miller to go to Yosemite for the rest of the summer as a naturalist guide. (In 1917, Miller, like Bryant, had used Yosemite Valley as an educational setting, offering a

course in ornithology for school teachers.) Miller told Mather that he needed proper preparation, which meant not starting the guide service until the summer of 1920. (Miller 1970, 15ff.). By early 1920, responding to active recruitment by both Goethe and Grinnell, Bryant and Miller had agreed to begin a nature guide service together.

1920: Public education from three angles

Beginning in June, 1920, visitors to Yosemite had three ways in which to enrich their vacation experience with a better understanding of the natural phenomena around them. The brochure for the 1920 Le Conte Memorial Lectures now described them as an annual event and announced that Joseph Grinnell and John C. Merriam would be among the four lecturers that year. Bryant launched the Free Nature Guide Service, still under the auspices of California Fish and Game and the California Nature Study League. Loye Miller joined him for a month, starting in mid-June. The two men variously offered three evening lectures per week at the resorts and Government Pavilion, shorter campfire talks, guided nature walks for adults and children, and information desk services for visitors.

A third and key initiator of public education programming was Ansel F. Hall, beginning in June his assignment as Yosemite's first park naturalist. A 1917 UC forestry graduate, where he had also studied with Grinnell, Hall had served as a ranger in Sequoia National Park and had done military service during World War I. Hall would establish park publications, including the 1921 *Handbook of Yosemite National Park*, to which Le Conte Memorial lecturers and Mather contributed; guidebooks on Sequoia and Yosemite; and, beginning in 1922, the periodical *Yosemite Nature Notes*. He also oversaw creation of a new, professionally designed, museum, with assistance from the Museum of Vertebrate Zoology and support from the university in the form of a campus office and workshop. Beginning in 1920, the UC old school tie would engage Hall, Bryant, and Miller in helping to solve problems that arose from the second-year Le Conte Memorial Lectures.

The lectures indeed needed help. While the matter of venue had been improved with completion of a new amphitheater at the Le Conte Memorial Lodge, a joint project of the Sierra Club and Yosemite park staff, the second year did not run as smoothly as the first. While Bryant took pains to support the Le Conte series through publicizing them widely and postponing Nature Guide lectures that might present competition, attendance, which ranged from 50 to 200, disappointed UC Extension.[14] The seating capacity at the Government Pavilion partly accounted for the limitation on numbers.[15] However, with the great post-World War I increase in automobile tourism in Yosemite, Extension's expectations might not have been that unrealistic. A wreck on the Yosemite railroad line prevented Merriam from delivering his first scheduled lecture. Miller stepped in with a substitute lecture on birds and Merriam condensed his two lectures into one to compensate.[16]

1921–1924: Difficulties accumulate

At the beginning of 1921, UC Extension made a unilateral decision to discontinue the Le Conte lectures, citing expense and a shortage of funds. As Lectures Department Secretary Ethel Strohmeier would later write to Superintendent Lewis, the lectures cost a lot. To be worth the expenditure, each should attract an attendance of at least 500 to 600.[17] Extension's action brought a quick and pained response from the NPS. As a February 16, 1921, memo

to the file records, Mather "earnestly" requested that the series be continued. Strohmeier suggested that the lectures might continue if Mather would supply the funds necessary from a combination of Park Service resources and contributions raised from the railroad companies, concessionaires and the public.[18]

There was considerable irony in Strohmeier's proposal. At the beginning of 1919, when the Extension Committee on Lectures proposed the Le Conte Memorial Lecture series, there was a negative initial response from the Extension Advisory Board. Some members evidently worried that the lectures would be misattributed to the concessionaires and thus lack suitable university gravitas. Perhaps anticipating such a roadblock, the Extension's assistant director had conferred in advance with board member Merriam, who was, not surprisingly, enthusiastic about the Le Conte idea. Merriam not only steered the board toward approving the lectures, he also followed up with his "very close friends" Mather and Albright to secure NPS support, as well as approaching the Sierra Club for their cooperation.[19] The assistant director could shortly report that Merriam had secured Albright's promise that NPS would "give our lecture course enormous publicity and, what will doubtless most win the approval of the Advisory Board here … control the interest of the concessionaires … so as to avoid any offensive effort … to use them for purposes of their own."[20]

Be that as it may, Ansel Hall was ready to help drum up financial support from the concessionaires, and in March began what for the next four years would be an arduous fundraising campaign on behalf of the lectures. He arranged a meeting between T.E. Farrow, the manager of the Yosemite National Park Company, and Extension Director Leon Richardson, who explained that if transportation and accommodations could be covered, the lectures could continue.[21] On March 9, 1921, Yosemite's Acting Superintendent E.P. Leavitt wrote to Farrow, thanking him for picking up requested expenses and commenting, "We feel that the Le Conte Memorial Lectures will be the means of making Yosemite Park more popular each year and any help from these lectures or publicity through them will redound to the benefit of the Concessioners in the Park as well as to the Government."

The 1921 lecture series went forward, drawing audiences that ranged from 200 to 300, total attendance increasing by more than 1,000 in comparison with 1920. Bryant and Miller returned to continue the Free Nature Guide Service, co-sponsored by California Fish and Game and Yosemite National Park, and helped out with the lectures as needed. As Strohmeier wrote to Helen Spalding in the Southern California UC Extension office, "[Loye Miller and Harold Bryant] have been splendid in promoting our work and we greatly appreciate this.…"[22] Mather's *Annual Report* commented, "It is to be hoped that [the Le Conte Memorial Lectures] will be continued, forming as they do a most important part of the park educational program."[23]

So they did, with 1922 representing a high-water mark for Le Conte Memorial Lecture attendance as well as expansion of other educational initiatives in the national parks. As visitation in Yosemite reached 100,000,[24] attendance at the Le Conte lectures ranged between 250 and 600 and totaled 4,600, the series' best year. Bryant took sole charge of the Nature Guide Service, still on the California Fish and Game payroll, and he and his guides reached nearly 40,000 visitors. Hall's new museum was now open to the public, though it would require a grant from the Laura Spelman Rockefeller Foundation to build an adequate facili-

ty. All educational activities were now consolidated under Hall's supervision.[25] Similar services had been initiated in parks beyond Yosemite and Yellowstone.[26] In Sequoia National Park, Judge Walter Fry created a volunteer nature guide service and wrote nature notes, with a wildflower show pointing the way to museum development.[27] In Glacier National Park, Montana State University initiated a free nature guide service, and one was begun in Rainier National Park as well.[28]

However, the cost-sharing arrangements with the concessionaires and transportation companies that had allowed the Le Conte lectures to continue had caused numerous headaches in both 1921 and 1922. W.L. White, general manager of the Yosemite Valley Railroad, at first balked at the donation requested of his company, citing legal prohibitions.[29] Farrow replied with a summary of Curry Company and Horseshoe Line agreements, observing, "I am not sure if you appreciate the caliber of men participating in these lectures; and the influence they would have in directing business." Lodging arrangements hit snags, too. Camp Curry and Yosemite Lodge had agreed to split the four lecturers between them for room and board. However, three of the four wanted to stay at the Lodge and Extension had to resolve the matter with the lecturers.[30]

Lewis's attempt to find a venue at which attendance could be increased foundered. As he wrote to Strohmeier on April 29, 1921, both the Yosemite National Park Company and Curry Company had made their own plans for entertainment. As Curry Company president Mrs. David A. Curry would point out, Camp Curry's evening entertainment programs were a popular draw for guests.

That Camp Curry evening campfire programs were the best organized, eclipsing those of competing commercial camps in Yosemite, is well documented (see, for example, Sargent1975; Greene 1987; De Mars 1991). When Indiana schoolteachers David and Jessie Curry launched Camp Curry in 1899, David used evening campfires to pass along what he was learning about Yosemite natural history and called on guests with expert knowledge or talents to share them with the other guests (Sargent 1975, 29). In 1912, for example, Curry asked guests John Muir and Stanford's entomologist Vernon L. Kellogg—both of whom were regulars on Sierra Club annual outings—to give campfire talks on Yosemite topics (Sargent 1975, 41) With institution of the Free Nature Guide Service, Bryant and Miller gave interpretive talks at no charge several nights a week at Camp Curry and other Yosemite resorts.

By the advent of the Le Conte lectures, Camp Curry's evening programs included paid entertainers such as a widow who did monologues in Irish, Negro, Yankee and Indiana farmer dialects; a "popular lecturer" who also personally guided daily hikes to points of interest; a pianist who played melodies by request; a baritone who sang ballads; and, in addition, the Glacier Point firefall and dances accompanied by a jazz band. It is likely that the miscellaneous—and largely non-expert—character of these entertainments was the source of the UC Extension Advisory Board's worries that the Le Conte lectures would be misappropriated by the concessionaires and seen as entertainment rather than serious university work.

Given this history, the Curry Company offered to give up one hour in an evening for a Le Conte lecturer, but no more. Strohmeier replied that this would not be satisfactory[31] and the lectures continued to alternate between the Le Conte Memorial Lodge and Government Pavilion. Between the lines, one reads UC Extension's refusal to subordinate their distin-

guished speakers to popular entertainers.

Planning for the 1922 Le Conte Memorial Lectures hit a curious, perhaps revealing, bump. With his return to summer school teaching in Berkeley, Miller volunteered to do a set of Le Conte lectures on his area of research expertise, California fossil animals, with the endorsement of UC Extension's Helen Spalding.[32] On January 18, 1922, Strohmeier replied that "while I think very highly of him, I believe it would be a mistake for us to schedule him for one of the groups of the Le Conte Lectures. He and Dr. Bryant are both lecturing in the Valley all summer and it does not seem advisable to ask them to speak for us." Strohmeier was in error about Miller's participation in nature guiding; and that summer, his Le Conte lectures attracted robust audience numbers. However, Strohmeier's resistance to blurring the line between the Le Conte lectures and Nature Guide Service echoed Extension Advisory Board doubts and would be a foregrounded issue during the attempt to revive the lectures in the late 1920s.

Hall paid a visit to Strohmeier in early 1922 to discuss subjects of potential interest to valley visitors, evidence of his attention to all phases of educational programming in Yosemite.[33] However, the solicitation of concessionaire contributions was running into increasing problems, as the rather testy exchange of correspondence in 1922 demonstrated. Mrs. Curry complained about the demand for long-term bungalow housing by Extension's on-site coordinator during the height of the tourist season: she assumed—incorrectly—that the Nature Guide Service was responsible for Le Conte lecture logistics. She added, "I feel that considering what both you and we do in the way of entertainment for our guests, that while these lectures are an additional attraction, they are hardly patronized sufficiently to put upon us the burden of their expense, since I believe it is much more largely the private camping element that attends these than it is those who are stopping either at the Lodge or at Camp Curry. It is only a matter of patriotism to the general cause of what is good for Yosemite that I feel we should be called upon to handle the expenses in this way."[34] (Note Mrs. Curry's characterization of the Le Conte lectures as an entertainment and an attraction.) However, the Curry Company continued to cover, if reluctantly, 32% of on-site costs. The Yosemite Valley Railroad and the Horseshoe Route refused to cover the requested 10% per company of total expenses, though both were willing to refund lecturer fares. The Yosemite National Park Company continued to pay the balance, including remaining transportation costs.[35]

Problems continued, fraying nerves all around. By the end of the summer, Strohmeier was insisting on a new business model. Each contributing concessionaire should be prepared to pay a lump sum to cover a portion of the costs estimated by Extension, using Superintendent Lewis's office as intermediary; lecturer reimbursements would be made through Extension.[36] This arrangement appeared to be acceptable, and on May 28, 1923, Superintendent Lewis forwarded checks totaling $500 to Strohmeier.

The lectures appeared to run more smoothly in 1923. Strohmeier called the on-site coordinator's attention to the help available from Superintendent Lewis—"…he is an extremely busy man, yet pleasant and courteous at all times"—from Bryant, particularly with publicity, and at the Le Conte Memorial Lodge, "Be sure and call on [Lodge Custodian] Ansel Adams … as he can give you considerable assistance on the evenings that lectures are held [there]. For the past few years he has been there representing the Sierra Club which

owns the Lodge and keeps it open all summer for the convenience of guests in the Valley."[37] The coordinator noted Hall's help in projecting slides and Bryant's help in meeting a lecturer's train and introducing him to the lecture audience.[38] One senses a note of pride in Strohmeier's letter to a Le Conte lecturer when she wrote, "Dr. Bryant's nature guide work and the LeConte Memorial Lectures constitute the educational work being done in the Park. The Government has not only strived to increase this work in Yosemite National Park but to extend the same type of educational service to the other National Parks throughout the United States."[39]

Nevertheless, the overall attendance had fallen back to the 1921 level and clearly the question of the cost to Extension had again come to the fore. On February 28, 1923, Richardson sent an inquiry to a range of people with an interest in the Le Conte lectures—former Le Conte lecturers and C.M. Goethe among them—asking whether cost justified their continuation. Goethe's enthusiastic "Yes!" was likely typical of the response. Joseph Grinnell's response was even more pointed: though the audience may be small, "it is a *select* attendance, by people of intellectual discrimination far above what I suppose to be the average of those attending the usual Extension lectures."[40]

Strohmeier's 1923–24 Lectures Department annual report to Richardson noted that the planned 1924 Le Conte lectures represented "somewhat a departure from those given in previous years." She continued, "There is wide diversification of opinion as to what the lectures should include. Those with direct interests in the Valley a part of whom are developing the nature guide work, feel quite strongly that the lectures should always deal with natural history … while still another group, which seems to represent the majority, believe attendance would be materially increased if timely subjects of more general interest were presented." Accordingly, a reduced program of nine lectures would be given on the topics "Literature of the Sierra," "America's Place in the World," and "Psychology and Human Living"—only the first topic having any connection with Yosemite. The "outdoor school" idea that had animated the first years of the lectures and bound them philosophically to the public education efforts promoted by Grinnell and Merriam and their students was lost through UC Extension's decision.

Attendance at the 1924 lectures plunged. The Extension site coordinator, Boyd B. Rakestraw, sounded the warning that the new direction in lecture topics had been a serious misstep: "It is difficult to work up interest in outside subjects when one is so close to nature. While Dr. Lehman's lectures [on Sierra literature] do appeal, the interest in the others is particularly difficult to develop here. With the exception of a few who live here … the people here are interested in the valley and the Sierra and lectures along those lines would have more appeal."[41] Competing entertainment at the camps did not help. For example, though the Nature Guide Service was working hard to publicize the lectures, one Le Conte lecturer had to compete with Camp Curry's evening of "high class entertainment," a trio of musicians from the Los Angeles Philharmonic.[42]

On July 1, Strohmeier wrote to Superintendent Lewis, asking his opinion on general versus natural science topics. He, in turn, solicited the views of the valley concessionaires, replying to Strohmeier on July 7 that there was "an adversity of opinion" on general topics. The Yosemite National Park Company's traffic manager, H.H. Hunkins, was blunt: the com-

pany would support future Le Conte Memorial Lectures only if they were on subjects related to Yosemite National Park. On a more conciliatory note, he added that for such a program, his company would eliminate competing entertainment on nights of the lectures.[43] Harold Bryant spoke to company manager T.E. Farrow and found that he, too, was in a conciliatory mood: the Yosemite National Park Company and Curry Company should cooperate more than they had in the past to support the lectures, both venues should host lectures, and competing entertainment should be suspended. However, Bryant added, "Sentiment thus far seems to have been less favorable to the present series than in the past apparently on account of the subject material."[44] While Mrs. Curry wrote that she had heard good things about the year's lectures, "people, while in the valley, are especially interested in valley subjects in a way that they would not be perhaps at any other time, and it is therefore the psychological moment to impress them with the importance of the work here."[45]

The lectures come to an end

On April 24, 1925, Strohmeier informed Lewis that UC Extension was discontinuing the Le Conte Memorial Lectures, given funding reductions: "After offering these lectures for the past six years we feel that we have had a real part in promoting education in the Valley and we sincerely hope that you will find it possible to substitute something to take their place. Doctor Bryant's excellent work has … become so well established that the Leconte lectures will probably be less missed than they would have been a few years ago when educational work in the Valley was in its infancy." She added that Lewis's extensive support had made it possible to keep the series going for six years. Lewis's disappointment was palpable in subsequent correspondence, Ansel Hall conferred with both Extension and the park, and Extension Director Richardson conferred with Merriam, now president of the Carnegie Institute in Washington, D.C., and sent him a report on the lectures, including statistics on attendance.[46] However, the lectures were not revived.

In 1928, a final appeal to resume the lectures came directly from Merriam—who in that year was appointed chair of the Committee on Study of Educational Problems in National Parks, of which Bryant was a member—to UC President W.W. Campbell. Citing his own recent discussions with Campbell, as well as a letter from Hall, Merriam asserted, "I have been making a careful study of possibilities of education of the highest type through utilization of the National Parks and have the feeling that the Le Conte memorial lectures represent in many respects one of the most important and distinguished constructive efforts for utilization of the National Parks for educational purposes." Merriam added that he had been corresponding with Stephen Mather regarding "a study of Yosemite Valley with special reference to utilization of this great feature primarily for its highest purpose. Mr. Mather is in full sympathy with the proposal…. The Le Conte memorial lectures would help somewhat in leading the way."[47] Campbell looked for outside funding, writing on February 20 to Charles A. Thompson, president of the Native Sons of the Golden West, to see whether the organization would provide financial help to restart the lectures. The new NPS director, Horace Albright, continued in 1929 to urge Campbell to resume them.

In letters directed to President Campbell, Extension Assistant Director Rakestraw and Ansel Hall, from his position as Chief Naturalist for the NPS, offered a point-counterpoint

insight into what had made the university–Yosemite partnership fiscally difficult to sustain. Rakestraw complained that it was hard to find lecturers with pertinent research backgrounds; because they offered most of their research in their first lecture, it was not desirable to invite them again. Concessionaire entertainment and jazz programs competed with the lectures, and encouragement of patrons to attend the lectures was half-hearted. The bottom-line issue was that relative to cost, attendance did not compare with that at other Extension lecture series. However, if costs would be handled by others, such as NPS, the lectures could resume "as a contribution to the study of nature and to the general enlightenment on scientific subjects."[48] In rebuttal, Hall wrote that he had solicited funding from the concessionaires at great personal effort, not an ideal way to support the lectures. Echoing Grinnell, he noted that the lectures had been attended by a "select audience," that returning visitors cited the lectures as a reason for their return, and that the increase in park visitation in recent years would assure greater attendance at the lectures. Further, while the "jazz element" had been a problem in the past, NPS was trying to eliminate it. Donald Tresidder, currently president of the merged Curry and Yosemite National Park Company concessions, would likely eliminate competition with the lectures and, with the Park Service, would cooperate in every way. Hall concluded, "During the past five years, the educational activities of the NPS in Yosemite National Park have gained enormous impetus so that now almost every visitor to Yosemite is served by Government ranger naturalists at the museum, on Government field trips, and popular commercialized lectures, etc. We find that the public is now demanding such service and are sure that the reestablishment of the LeConte Memorial Lectures would again be the finest feature of the educational program during the entire season."[49]

Another confounding factor lay behind the difficulty in reviving the Le Conte lectures. The original circle centered in the Museum of Vertebrate Zoology had come to an unacknowledged but decisive split in how they viewed what was the most effective approach to delivering public education in the parks. That split would be reflected by Grinnell himself during the final discussion of whether to revive the Le Conte lectures, as discussed below. Merriam, too, came to part company with NPS over the issue of public education. As president of the Carnegie Institute, he had directed funding toward both research and museum development in the parks during the 1920s. At the height of his influence on park leadership, he persuaded Mather to advance Merriam's contention that the primary purpose of national parks was to serve as America's "super-universities." In his view, educational programs in each park should be guided by a chief naturalist with university research and faculty experience. But by the 1930s, as park leadership changed and Merriam's influence waned, he bitterly identified the Park Service's primary goal as becoming, not the steward of America's super-universities, but the "Super-Department of Recreation" (Mark 2005, 106–107, 113, 121).

For his part, Bryant increasingly found standard university science training inadequate for the kind of public education in development across the national parks. By 1925, he had come to the conclusion that formal university training was insufficient background for effective nature guides. Carrying on the early and animating metaphor of Yosemite as an outdoor school, Ansel Hall's *Yosemite Nature Notes* had asserted that "The [Nature Guide] Service probably forms the largest trail school in the world, and trail school it is for people who are

led to study nature, not out of books or in a laboratory, but first hand." The next issue added that school teachers vacationing in Yosemite were turning the Park Service "into a regular summer school," looking to the guides for resources to take what they were learning into their own schools. The Museum of Vertebrate Zoology helped out by creating a list of books on natural history of the West. The nature guide's motto, adapted from Goethe's California Nature Study League, was to teach visitors "to read nature as a book."[50]

In February 1925, Bryant announced establishment of the School of Field Natural History to train teachers of nature study and nature guides, with "stress … upon first-hand information from the living thing itself rather than upon printed or spoken words, although these also play a part."[51] Bryant defined how public education in Yosemite should be focused in the following way: "Every summer vacationist wants to be able to identify interesting forms of life encountered.… Biology as taught in the average high school and college does not emphasize field study; and as a consequence there are few persons who are able to recognize, name and properly study living things along a trailside."[52] With Bryant in charge of the school, faculty in the early years included such nature guides as Enid Michael, a Loye Miller student and former school teacher; university faculty such as UC entomologist E.O. Essig, who also taught a university summer class in Yosemite (the school was planned to coincide with UC's summer session); current schoolteachers such as M.B. Nichols of Oakland Technical High School; and researchers such as the Carnegie Institute's paleontologist Ralph Works Chaney. When Grinnell student George Melendez Wright joined Yosemite as a ranger naturalist, he too would teach for the school.[53] Yet, as will be seen, even the involvement of Grinnell's students failed to impress him that nature guides were other than science popularizers, an irony given his own advice in 1919 to Mather that the proposed resident naturalist should take out bird classes in the afternoon and give evening talks on local natural history, including birds, mammals, reptiles, fish, forests and flowers,[54] an echo of what the Sierra Club promised in announcements of its annual outings.

The lectures are not revived

The final chapter on the Le Conte Memorial Lectures was written by a committee appointed by President Campbell. Among its members were Joseph Grinnell and Willis Linn Jepson, with Rakestraw acting as chair and likely as drafter of the committee's report. The committee concluded their business in a single meeting on August 16, 1929. Rakestraw's odd notion that lecturers should not be asked twice was rejected by the committee. However, a sensitivity—or arrogance—about the Le Conte lectures vis-à-vis the Nature Guide Service was inescapably evident in the language of the draft report. The committee asserted that the lectures should be real contributions based on first-hand scientific investigation, "delivered in a dignified manner [to] raise the standards of the current popular type of 'nature' lecture," and not just a supplement to the Nature Guide Service. While resumption of the lectures "would not be undesirable," the growth of the Nature Guide Service may have lessened "the need for lectures of the type of the LeConte Memorial Lectures." If continued, a 50% contribution to costs by NPS would prove that the lectures were really wanted.

These recommendations show the hand of Joseph Grinnell, whose edits softened even more truculent language in the draft.[55] Yet in the notes he wrote for himself in preparing for

the committee meeting, he was direct in his slighting comparison of a university-based lecture series versus the park's own program: "…University gives certain backing which is authoritative and dignified—apart from lecture bureaus or the nat. park nature guide service itself: representative of latter not original 'researchers,' but 'retailers.'" The distinction he drew harked back to his 1923 letter urging Richardson to continue the lectures, and even to the initial debate within the Extension Advisory Board on whether to launch the Le Conte lectures. Grinnell reiterated in 1929 that the lectures were of value to relatively few, but those few were of the upper intellectual class. The nature guide service fully met popular needs, in Grinnell's view. The Le Conte lectures should be viewed as an addition to this service, informational and instructional rather than entertaining and amusing—two sets of aims that Grinnell considered to be at odds.

Rakestraw sent President Campbell a somewhat modified account of the committee's recommendations on September 2, concluding that the lectures should resume on a 50/50 division of costs between the university and NPS. However, revival of the lectures was not to be. Two months after the committee's recommendations were submitted, Black Tuesday marked the beginning of the Great Depression and an end to any hope of special funding.

Conclusion

The history of the Le Conte lectures reveals early fissures in both the cobbling together of multiple partners to support this academically oriented form of public education and in the growing separation between the UC's faculty views of public education and those developed by the founders of interpretive programming in Yosemite and NPS. National park leadership clearly valued the prestige of noted professors lecturing to the public in Yosemite and worked very hard to hold the funding partners together. To the concessionaires, they argued that distinguished Le Conte lecturers could exert a good influence on business. While the concessionaires gave lip service to the value of the lectures, they were not convinced, finding their own entertainment programs more effective in bringing in customers.

The university itself was unable to pledge a stable and secure funding base for its share of lecture costs. While President Campbell made a last-ditch effort to locate donor funding from at least one organization, there does not appear to be a record of approaching the Sierra Club or other potentially sympathetic groups. While one has to take the expression of fiscal difficulty at face value, Rakestraw's letter to Campbell also echoes the "hassle factor"—the list of annoyances recorded over the Le Conte years by UC Extension staff in both Berkeley and Yosemite. It is not clear that Extension staff fully understood the need or developed effective strategies to publicize the lectures steadily to a potential audience that changed literally day by day. Bryant and Hall did what they could to help here, doubtless more appreciative of the nature of the Yosemite visitors, but from Extension's point of view, these efforts evidently fell short. Even more glaring in misreading the potential audience for the Le Conte lectures was the unilateral redirection of lecture topics in 1924 from Yosemite-oriented presentations to "general interest" topics. Though Extension staff were clearly given ample warning that this approach was misguided, they persisted, with rather dramatic results in terms of reduced attendance at the lectures.

The question of what constituted effective public education for park visitors proved

even more vexed. The UC cadre that promoted and began formal programming in Yosemite was interconnected. Grinnell and Merriam trained Miller and Bryant as graduate students and, once their doctoral degrees had been conferred, the latter two continued their Berkeley connections through Extension and the summer school, respectively. Both were steady contributors to the Museum of Vertebrate Zoology. Ansel Hall shared their educational connection with Grinnell. The Museum of Vertebrate Zoology assisted Hall in Yosemite and national park museum development, to which inaugural Le Conte lecturers Alfred L. Kroeber and François Matthes also contributed. Grinnell, Merriam, and Hall were or had been Sierra Club members and had numerous colleagues on the faculty who guided trail walks and gave campfire lectures as part of the club's annual outing. As the university's purveyor of continuing education for the public, UC Extension represented another bond, with many Le Conte lecturers—Kroeber was just one example—also delivering education through Extension. At the outset of Yosemite's Nature Guide Service and Hall's assumption of the park naturalist position in Yosemite, Bryant and Hall clearly saw their work and the Le Conte lectures as part of an educational continuum, a view echoed in Mather's annual NPS reports to the secretary of the interior.

Yet the continuum would fray and split apart by the end of the 1920s. Extension personnel at first looked to the Nature Guide Service and Hall for their indefatigable assistance, and accepted it gratefully over the years of the lectures, when problem after problem was solved by their erstwhile UC colleagues. But Extension representatives had an underlying resistance to any blurring of lines between their offerings and those made under the Yosemite National Park aegis. By the end of the 1920s, a UC committee that included Grinnell and Jepson endorsed a definition of the university's contribution as men of science who would present results of their own research "in a dignified manner," calculated to "raise the standards of the current popular type of 'nature' lecture." The committee stressed that the lectures should be clearly separate from the Nature Guide Service. Implicit in committee language was an arch academic view of the popular education in the parks.

Thus, the initial continuum of academic and popular, represented by the strong connections among Sierra Club outing education, the Le Conte Memorial Lectures, and the Free Nature Guide Service, fell victim to the tensions well-known inside university walls between academic and popular work, between the original researcher who presents scientific results in a way that the general public can understand versus education that popularizes scientific subjects and puts a premium on education as a form of recreation. A bit of this tension existed even between the two originators of the Free Nature Guide Service, Bryant and Miller. Miller had needed some persuasion to take on the founder's role. He had written to Grinnell on January 22, 1920, that he was "greatly interested in seeing the National Parks movement succeed" and though inclined to return to the Fallen Leaf Lake lodge at the request of the proprietor, was willing to go to Yosemite as a matter of patriotic duty for a good cause. On February 17, 1921, Miller expressed to Grinnell his disappointment at not coming to Berkeley for his usual summer teaching appointment, "but the Yosemite work seems to need a wet nurse for some time yet." This hint of reluctance points to the difference between Bryant's and Miller's careers, with Bryant teaching outdoor education regularly for the continuing education-oriented Extension, while Miller's career was traditionally academic, as he com-

piled an impressive research record and would serve as the first chair of UCLA's biology department when the University of California created its "Southern Branch" out of the Los Angeles Normal School. In 1926, Miller would answer the national park call once again, going with his son Alden—a Grinnell doctoral student and future director of the Museum of Vertebrate Zoology—to Crater Lake at Hall's request to start the summer public education program there. But Miller's gently expressed arm's-length attitude hinted at an academic's stand-offishness toward the popularizing needs of a program intended to educate people as an extension of their recreational experience in the parks.

In the end, NPS would choose a popular approach to scientific subjects that put a premium on education as a form of recreation, in preference to the ideal of the researcher and academic who presented original scientific results in a way that the general public could understand. In the 1930s, Bryant and his colleagues in NPS would standardize the use of the term "interpretation" to describe the parks' core program of recreational public education. Yet the popular value of naming phenomena and introducing a park's natural history to visitors out in the field, a value well recognized in earlier years by the Sierra Club, Grinnell, and Merriam, would be amplified by combining identification with the ideal of seeing the interconnections among natural phenomena, modeled by Grinnell's and Merriam's academic work and the training that they gave their students.

A note on sources

The history of the Le Conte Memorial Lectures has been gleaned from archival sources held by the University of California's Bancroft Library and the Museum of Vertebrate Zoology. Records of the Sierra Club annual outings were also consulted at the Sierra Club's Colby Library in San Francisco. Bancroft Library holdings consulted:

- Records of University Extension, University of California, 1913–1957, CU-18
- University of California Extension Division, Lectures Department, Annual Report, 1919, 1920, 1921, 1922, 1923, 1924
- Le Conte Memorial Lectures, Box 3, Folders 55, 56; Box 4, Folders 1–6
- Lectures Department Annual Reports for 1919–1924, Box 3, Folders 4–9
- Administration, Leon Richardson Correspondence, Box 1, Folder 10
- General, William F. Bade Correspondence, Box 8, Folder 13
- General, W.W. Campbell Correspondence, Box 10, Folder 69
- Francis P. Farquhar Papers, 1912–1968, C-B 517, Carton 4
- Papers of Joseph Nisbet Le Conte, C-B, Carton 1, Volume 35
- John Campbell Merriam Papers, C-B 970, Box 2
- Regional Oral History Collection (see histories cited in bibliography)
- Sierra Club Records, 71/103c

Museum of Vertebrate Zoology holdings consulted:

- Correspondence files of Joseph Grinnell, Horace Albright, Harold C. Bryant, C. M. Goethe, Stephen Mather, John C. Merriam, Loye Miller, Boyd B. Rakestraw, Leon Richardson

Other archival sources:

- *Sierra Club Bulletin*, 1893–: Annual articles on outings, Le Conte Memorial Lodge custodian and Lodges Committee reports
- National Park Service, *Report of the Director to the Secretary of the Interior,* 1919, 1920, 1921, 1922, 1923. Washington, D.C.: Government Printing Office
- *Yosemite Nature Notes.* Yosemite National Park, California. I: 1; II: 7; IV: 4; XXXIX: 7 (Nature Guide Service issue).

Endnotes

1. For example, see Brockman (1978, pp. 24-43), and Mackintosh (1986).
2. Ella M. Sexton, commenting on John Muir's trailside lectures during the first Sierra Club outing in 1901, in the *Sierra Club Bulletin* (IV:1), p. 17.
3. *Ramblings* had been reprinted in its entirety in the January 1900 issue of the *Sierra Club Bulletin*.
4. Nalder to Matthes, May 21, 1919. Nalder also sent a letter on May 20 to Superintendent Lewis, conveying Mather's expression of support.
5. Nalder to Merriam, July 18, 1919.
6. Nalder to Lewis, May 20, 1919.
7. Nalder to Merriam, July 18, 1919.
8. Lecture attendance figures have been gathered from the *Annual Reports* of the UC Extension Lectures Department.
9. Nalder to Merriam, July 18, 1919.
10. Merriam to Campbell, February 28. 1913.
11. Grinnell to Merriam, March 3, 1919.
12. Merriam to Grinnell, April 3, 1919
13. Bryant to Grinnell, June 19, 1919.
14. *Annual Report*, 1920, p. 255.
15. Tapscott to Strohmeier, June 22, 1920.
16. Tapscott to Strohmeier, July 7, 1920.
17. Strohmeier to Lewis, April 6, 1921.
18. Strohmeier to Richardson, February 26, 1921.
19. Nalder to Richardson, January 18, 1919.
20. Nalder to Richardson, January 24, 1919.
21. Farrow to White and Huffman, March 4, 1921.
22. Strohmeier to Spalding, January 18, 1922.
23. *Annual Report,* 1921, p. 72.
24. *Annual Report*, 1922, p. 45.
25. Ibid., pp. 46, 115.
26. In 1920, as superintendent of Yellowstone, Horace Albright had appointed ranger Milton P. Skinner as park naturalist, supported by two seasonal rangers (Brockman 1978, pp. 30–31).

27. *Annual Report*, 1922, pp. 46, 120.
28. Ibid., p. 33.
29. White to Farrow, March 8, 1921.
30. Van Wyck to Strohmeier, June 11, 1921.
31. Strohmeier to Lewis, May 2, 1921.
32. Spalding to Strohmeier, January 16, 1922.
33. Strohmeier to Hunkins, February 17, 1922.
34. Curry to Hunkins, March 23, 1922.
35. Hunkins to Strohmeier, April 25, 1922.
36. Strohmeier to Farrow, July 25, 1922; Strohmeier to Hunkins, August 21, 1922.
37. Strohmeier to Smith, June 8, 1923.
38. Smith to Strohmeier, July 2, 1923.
39. Strohmeier to Snyder, July 10, 1923.
40. Grinnell to Richardson, March 8, 1923.
41. Rakestraw to Strohmeier, June 18, 1924.
42. Rakestraw to Strohmeier, June 20, 1924.
43. Hunkins, July 7, 1924.
44. Bryant to Strohmeier, July 1, 1924.
45. Curry, July 9, 1924.
46. Strohmeier to Lewis, May 8, 1925; Richardson to Strohmeier, May 7, 1925.
47. Merriam to Campbell, February 13, 1928.
48. Rakestraw to Campbell, June 26, 1929.
49. Hall to Campbell, July 30, 1929.
50. *Yosemite Nature Notes*, II:8, p. 1; II:9, p. 3; V:IIII:10, p. 2.
51. Ibid., V:IV:2, p. 9.
52. Ibid., pp. 9–10.
53. Attracting a substantial number of school teachers and establishing itself as the National Park Service's basic training program for interpretive staff, the school would continue until after World War II, with a hiatus during the war years.
54. Grinnell to Mather, June 6, 1919.
55. The UC Extension files on the Le Conte Memorial Lectures include the unedited draft report, approval by some committee members, and Grinnell's edited copy.

References

Albright, Horace, Russell E. Dickenson, and William Penn Mott, Jr. 1987. *National Park Service—The Story behind the Scenery.* Las Vegas, Nev.: KC Publications.

Brockman, C. Frank. 1978. Park naturalists and the evolution of National Park Service interpretation through World War II. *Journal of Forest History* 22, 24–43.

Bryant, Harold C., and Newton B. Drury. 1964. *Development of the Naturalist Program in the National Park Service.* Berkeley: Bancroft Library Regional Oral History Office, University of California.

Bryant, Harold C., and Wallace W. Atwood, Jr. 1932. *Research and Education in the National Parks.* Washington, D.C. U.S. Government Printing Office.

Casamajor, Paul, ed. 1965. *Forestry Education at the University of California: The First Fifty Years.* Berkeley: California Alumni Foresters.

Cohen, Michael. 1988. *The History of the Sierra Club, 1892–1970.* San Francisco: Sierra Club Books.

Demars, Stanford E. 1991. *The Tourist in Yosemite, 1855–1965.* Salt Lake City: University of Utah Press.

Farquhar, Francis, 1963. *Francis P. Farquhar on Accountancy, Mountaineering, and the National Parks*, Berkeley: Bancroft Library Regional Oral History Office, University of California.

Greene, Linda Wedel. 1987. *Yosemite: The Park and Its Resources*, 3 vols. Washington, D.C.: National Park Service.

Grinnell, Hilda Wood. 1940. Joseph Grinnell: 1877–1939. *The Condor* XLII:1 (January–February), 2–34.

Grinnell, Joseph, and Tracy I. Storer. 1916. Animal life as an asset of national parks. *Science* (n.s.) 44:1133, 375–380.

Jones, Holway R. 1965. *John Muir and the Sierra Club: The Battle for Yosemite.* San Francisco: Sierra Club.

Le Conte, Joseph N. 1919. *Journal of 1919 High Sierra Trip.* Berkeley: Joseph N. Le Conte Papers, Bancroft Library, University of California.

Mackintosh, Barry. 1986. *Interpretation in the National Park Service: A Historical Perspective.* Washington, D.C.: National Park Service. Online at www.cr.nps.gov/history/online_books/mackintosh2.

Mark, Stephen R. 2005. *Preserving the Living Past—John C. Merriam's Legacy in the State and National Parks.* Berkeley: University of California Press.

Miller, Loye Holmes. 1970. *The Interpretive Naturalist.* Berkeley: Bancroft Library, Regional Oral History Office, University of California.

Runte, Alfred. 1990. *Yosemite: The Embattled Wilderness.* Lincoln: University of Nebraska Press.

Sargent, Shirley.1975. *Yosemite & Its Innkeepers.* Yosemite, Calif.: Flying Spur Press.

Shankland, Robert. 1970. *Steve Mather of the National Parks.* New York: Alfred A. Knopf.

Sierra Club. 2009. Le Conte Memorial Lodge. Online at www.sierraclub.org/education/leconte (accessed October 21).

Stock, Chester. 1951. *John Merriam Campbell, 1869–1945: Biographical Memoir.* Washington, D.C.: National Academy of Sciences.

Karen Merritt, Office of the President, University of California, 1111 Franklin Street, Room 11205, Oakland, California 94607; kmerritt@ucmerced.edu

Managing the National Park Service in the Information Age

Harry Butowsky

Introduction

In 2008, the National Parks Conservation Association convened the National Parks Second Century Commission, which was charged with developing a 21st-century vision for the National Park Service. The commission's report, published in 2009 (www.npca.org/commission), recommended dramatic enhancements to the national park system and the National Park Service's ability to protect our breathtaking landscapes and historic and cultural treasures. As the commission report suggests, management of these landscapes and historic and cultural treasures will be dependent upon mastery of information systems:

> Our nation is best armed to address the future with a public knowledgeable about its history, its resources, and the responsibilities of citizenship. The national park system encompasses an unparalleled range of educational assets, including distinctive land- and water-based ecosystems and cultural landscapes, historic sites and structures, artifacts, and primary source documents. . . . Successful management of park resources will require mastery of systems ecology and information systems.

To implement the recommendations of the National Parks Second Century Commission, the National Park Service will need forward-looking management, the creative use of modern technology, and a clear understanding of our past history and the importance of our information resources. As the commission report suggests, the National Park Service now stands at a crossroads where we will either miss opportunities to protect the legacy of the resources given to us by previous generations, or embrace the future. Modern information technology is now available to protect our parks, and to establish necessary partnerships with other organizations and our public to help forge a better world where these vital resources are protected and cherished for generations to come.

Information the key to effectiveness

In today's environment, the National Park Service must make the most efficient and best possible use of its information. To do this, information must be available and easy to access for

The George Wright Forum, vol. 27, no. 3, pp. 323–327 (2010).

ISSN 0732-4715. Please direct all permission requests to info@georgewright.org.

all of our employees and the public at large. The ability to find, analyze, and use information will determine the effectiveness of National Park Service management in the future and our success in meeting the challenges established by the National Parks Second Century Commission. The National Park Service will not be fully engaged with the modern age until we organize and make our vast library of information available to our employees and the public. To prepare for the future, we must understand what previous generations of park managers have done in the past.

Advent of the Internet

The Internet is one of the most important new tools for National Park Service managers in the 21st century. Combining aspects of publishing, broadcasting, networking, teaching, interactive participation, resource-sharing, and even fund-raising, the Internet offers cultural resource managers exciting new opportunities and challenges.

In 1995, National Park Service Director Roger Kennedy decided there was no practical alternative to the Park Service's participation in this latest evolution of communications, the Internet. Kennedy decided that everybody in the future was going to be using the Internet and that this was the new medium of communication. The National Park Service had to embrace this new medium.

Since that time, the National Park Service has made immense progress with the Internet. Every park, program, and office now has its own Web site. Tens of thousands of Web pages can be accessed by the public with only a computer and a click of the mouse. With the possible exception of the invention of moveable type in the 15th century, this explosion of and ease of access to information has done more than anything else to change the way we operate, communicate, and work. New and old reports, studies, and data can now be found and put to work for the manager and the public. Special software now allows the visually impaired to "read" these electronic documents, enabling a new audience access to park information.

The advent of blogs; social networking sites like Facebook, Twitter, and other popular and useful sites such as YouTube and Flickr; and smart-phones and cell phone technology (like the iPhone) have sped our ability to find needed information. While many of these technologies are not used by federal agencies, the time is near when they will be incorporated into our gallery of electronic information sources.

More people now visit park Web sites than actually visit the parks. Visitors to our virtual national parks come from not only every state but almost every country in the world. Not only is information about our parks going out to the world, but emailed requests for more information are flowing back to the Park Service.

The computer and its access to the Internet are now essential to the management of our offices. Indeed, it is hard to imagine how we ever operated without this wonderful tool. When we lose access to the Internet, much of the work of the National Park Service comes to a halt.

Importance of information

The resources available to manage our national parks are finite. Information is not. Informa-

tion can be used over and over again. Information can also be used to make up for limited resources. A historic resource study, an interpretive plan, or a natural resource management plan can be used repeatedly by anyone interested in or needful of this information. The time and effort required to complete the document has been paid for by the National Park Service. All that the researcher or park manager needs is to find and use this information without needing to regenerate it.

Our use and re-use of information not only makes common sense, but is also ecological, sound, and efficient. No information, however, can be useful if it remains in a file cabinet, unknown and unused by our managers and staff. It is only when we can quickly access our information and act on it that we contribute to the well-being of our parks and provide the best service to our visitors.

Wealth of information

The National Park Service, established in 1916, is now nearly 100 years old (see Barry Mackintosh's *The National Park Service: A Brief History,*1999, online at www.nps.gov/-history/history/hisnps/NPSHistory/briefhistory.htm). During these years, the Park Service has generated thousands of historical reports, drawings, photographs, letters, artifacts, and other archival material on every subject relating the history of the agency. By "historical," I mean any type of report or subject material covered for a report, including geological, biological, as well as cultural resource management reports.

The eight volumes in the George Wright Series, and other volumes in our Popular and Scientific Monograph, Source Book, Transactions & Proceedings, and Urban Ecology series, are all now on the Internet, facilitating quick access by managers, staff, and the public. For the National Park Service Handbook Series, see www.nps.gov/history/history/online_books/handbooks/index.htm; for the National Park Service Publications Series, see www.nps.gov/history/history/online_books/series/index.htm.

Our goal should be for everyone in the National Park Service to create, share, and collaborate in information management. All employees in the National Park Service have computer access and can quickly link to the Internet. This gives the Park Service family the ability to create large economies of scale.

Since 1999, the National Park Service History Program has been creating electronic editions of our paper studies and placing them on the Internet (www.nps.gov/history/-history/index.htm). With more than 4,000 items on the Internet, this History E-Library is open and available to the public 24 hours a day. This information ranges in dates from the second half of the 19th century to new material published this year. Some are published in the private sector with the permission of the publisher; others are studies directly created by the National Park Service personnel.

Other offices in the National Park Service have Web sites relating to education, travel, and children, and to professional disciplines, including archeology, anthropology, geology, biology, and other subjects. Most of this material is new and created for the Internet, but a portion of it is not and reflects the inherited knowledge base of the Park Service.

Databases and search engines

To manage and find this information, the National Park Service has more than 20 distinct databases and search engines. Servicewide, we have NPS Focus, the Voyager Library Program, the Technical Information Service, and the Natural Resources Information Portal, to name a few.

Many of our individual offices and programs have their own databases, including those of the National Register of Historic Places, Historic American Buildings Survey, Historic American Engineering Record, and Historic Architecture Program. Some of these databases link to each other, but most do not. These stand-alone databases make it difficult to find information across the many programs, parks, and platforms. All of these databases need to be linked with one comprehensive search engine that will access all of these sources of information.

The future

Among the recommendations of the National Parks Second Century Commission, one is that the Congress "affirm in Legislation that education is central to the success of the National Park Service mission." The commission also stresses the need for the National Park Service to promote greater partnership opportunities among the national parks and educational institutions, to invite all Americans to build a personal connection with the parks, to engage diverse audiences, and to break down internal barriers between Park Service offices to encourage the agency's preservation, research, and educational functions.

The best way to accomplish all this is for the National Park Service to make a commitment to give the public greater accessibility to our information by placing all non-sensitive agency reports and documents online. The National Park Service needs to begin a comprehensive program to digitize all of our records ranging from 1916 to the present.

All new records should be made immediately available to the public. All of this material should be accessible through one portal which searches across park and program boundaries. Information deemed sensitive should be placed on intranet servers and only be accessible to National Park Service employees or program managers.

The technology to do this is getting cheaper and easier all the time. With the availability of portable computers, tablet devices, and even smart phones, information should be no more than a few clicks away anywhere in the world.

To facilitate this ease of access, we in the Park Service have to consolidate our information sources and coordinate our Internet efforts servicewide. We need to do the following:

- Ensure that our many offices operate with the same information systems and have the ability to link to each other;
- Cooperate and pool resources and systems;
- Create a common search engine, a Web-based archive, which will access all of our information resources at the same time;
- Invest in a concerted effort to locate, scan, and place our vast library of information on the Internet; and

- Make use of blogs, social networking sites, smart-phone applications, and other emerging technologies, as appropriate, to better share Park Service resources and information, and invite the public to participate in the Park Service idea.

Energy should not be wasted in re-doing electronic documents simply to adhere to the latest format that is currently in vogue; limited resources would best be invested in adding new electronic content. Archived material should not be deleted, but any relevant information should be preserved, as-is, as long as browsers can still view this data (and only then converted to the latest format). New formats must be able to access historical formatted data.

We need to do this so we can better communicate with our employees and public and manage our information resources in a timely and cost-effective manner. We need to do this to meet the stated goals of the National Parks Second Century Commission. Our library of information represents a vast databank containing the intellectual capital that has been deposited by past generations of Park Service employees. We need to take advantage of this capital to manage the issues of today and the future. We need to facilitate leading-edge technologies now available to us to serve our customers—both public and private—and manage our resources.

It is essential that we also obtain the cooperation of other governmental and private agencies to both use their information resources and make our information resources available to the widest possible audience. If we can do this, we will have taken one important step toward advancing the national park idea into the 21st century.

Harry Butowsky, National Park Service, 1201 I Street NW (2261), Washington, D.C. 20005; harry_butowsky@nps.gov

GEORGE
WRIGHT
SOCIETY

P.O. Box 65
Hancock, Michigan 49930-0065
USA

www.georgewright.org

caring for protected areas