

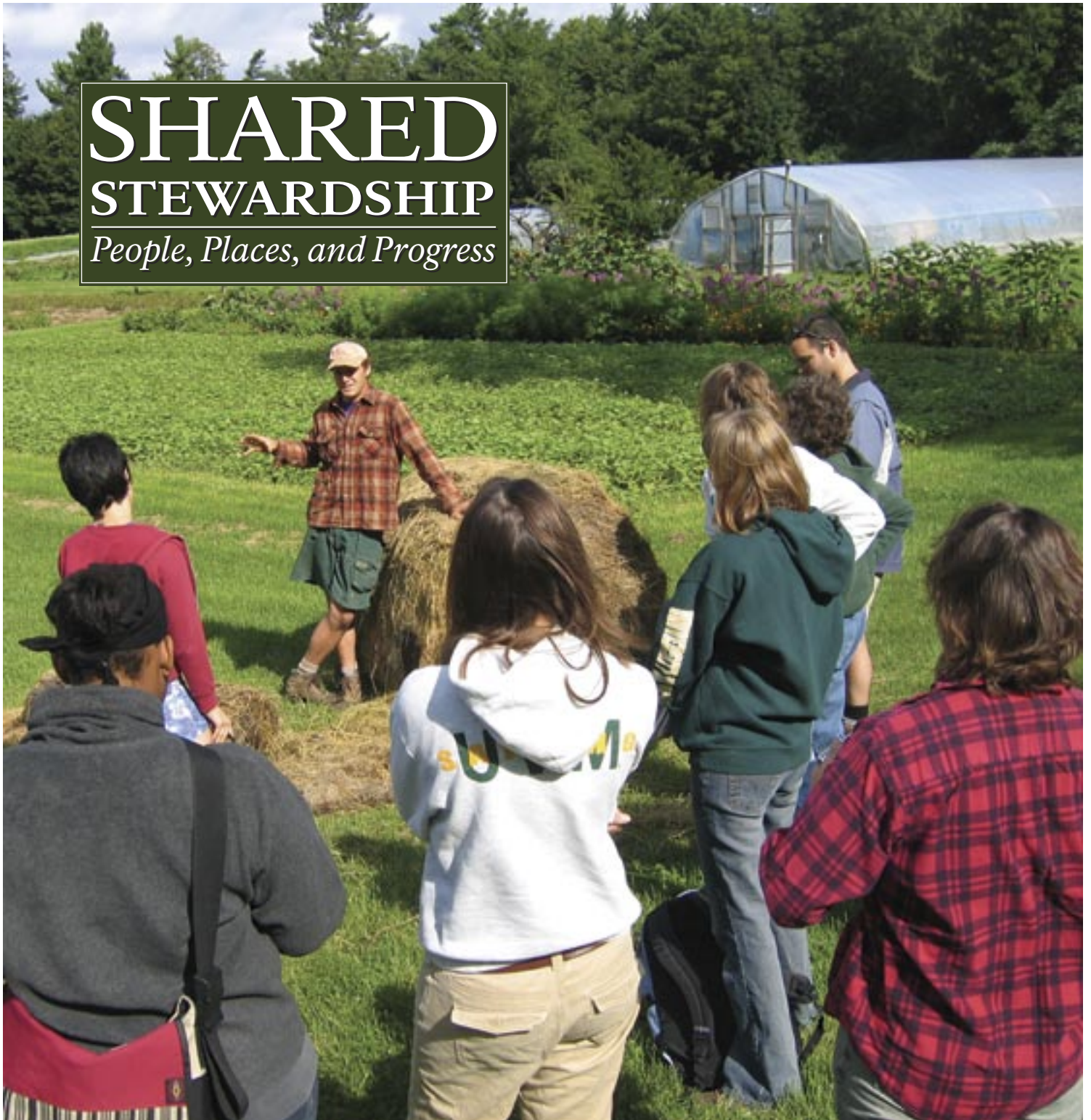


Sustainability news

Spring 2005

SHARED STEWARDSHIP

People, Places, and Progress



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On the Internet

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Cover: Students learn about stewardship of natural and agricultural resources at Shelburne Farms National Historic Landmark in Vermont.

PHOTO BY MARSHALL WEBB

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PHOTO BY BARBARA SLABY

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PHOTO BY MARSHALL WEBB

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Peach trees remain a powerful symbol of the canyon community at Canyon de Chelly National Monument, where the NPS is assisting to reverse a decline in fruit production.



PHOTO BY TARA TRAVIS

Leadership Notes

I am an optimist. That's how I can look to the horizon and see a more sustainable landscape. I believe that an overwhelming majority of people genuinely care about the world outside their cars and offices. They will make decisions for a healthier world, if good choices are available, and if we can convey the message in a way that connects them to their landscapes and the natural resources that sustain us.

In this issue, we explore relationships between people, their landscapes, and their future. Communities around the country are rediscovering the land and their heritage, and embracing organic, locally grown foods and crafts as economic and health alternatives. Farms are operating in a sustainable manner, opening their facilities to visitors and local communities to learn about their products. We even have NPS buildings with landscaped roofs that provide cooler indoor climates and reduce greenhouse gas emissions.

People have always visited national parks to strengthen their relationship with the outdoors and experience their heritage. Today people want to reconnect to the landscape in other meaningful ways. What is different now is that they seek these experiences in their daily purchases, their driving habits, their vacation plans, and their school curriculums.

What is the NPS role in this emerging trend? The answer lies in many of the stories in this issue, as well as stories that are now in the making. We need to ensure that everything we do, everything we buy, and all the stories we tell lead to a healthier and more sustainable landscape.

—Shawn Norton, Coordinator National Park Service Environmental Leadership Program

Parks Reflect Innovation and Collaboration

Whether their primary motivation is taking a tour, relaxing or recreating, when Americans visit their national parks, they have an almost universal curiosity about how the parks actually work. When I was superintendent at Frederick Law Olmsted National Historic Site, part of the regular tour included a visit to a working paper conservation lab in one of Olmsted's drafting rooms, where original park plans were being unrolled, flattened, and conserved.

Visitors loved it—it was the highlight of their tour, perhaps because the activity was something unexpected and real, or maybe because they connected the experience to the care of their own personal treasures—the photographs, the family Bibles, diaries, and other possessions passed on from one generation to the next.



Superintendent Rolf Diamant maintains a conservation legacy that continues to promote new thoughts and actions.

Every summer at Marsh-Billings-Rockefeller National Historical Park, we have a “Forest Festival” weekend celebrating the nation's oldest sustainably managed forest with a wide range of participatory activities around the topic of forest stewardship. Last summer the festival included a special oral history program, where an invited panel of about 20 maple sugarers, tree farmers, foresters, and wood craftsmen from surrounding communities, was asked to reflect on what stewardship meant to each of them personally, in particular through the perspective of work and their connection to their land. Many were in their seventies and eighties and had come with their families, who pretty much filled up the room. But

as the program started and panelists began telling their stories (most likely for the first time in public), I noticed more and more park “visitors” slipping into the back of the room and quietly setting up a folding chair.

In 1915 Mark Daniels, first general superintendent for national parks, described Yosemite National Park as “almost in the category of a city” and talked about the need for a “civic plan.”

From its earliest days, the NPS has had the opportunity to demonstrate “best practices” in a wide range of civic endeavors such as planning and architecture, scenic road construction, and historic preservation. More recently, as seen in the pages of **Sustainability News**, these “best practices” have expanded to embrace alternative energy transportation systems, sustainable design and infrastructure, pollution

prevention, energy conservation, independent “green” certifications and even the serving of local and organic foods by a small but growing number of park concessioners and cooperators.

There are, of course, real constraints on what can be or should be interpreted to the public. But if it is true, as Wallace Stegner has said, that national parks “reflect us at our best,” we need to continue to be thoughtful and transparent about the way we conduct our business—not only what we do, but how and why we do it. ■

—Rolf Diamant, Superintendent, Marsh-Billings-Rockefeller NHP

Park-based learning is powerful—and transformative. People more readily retain information, grasp meanings, and adopt new behaviors and values when directly involved with cultural and natural heritage resources and sites.

—NATIONAL PARK SERVICE DIRECTOR FRAN MAINELLA, RENEWING OUR EDUCATION MISSION



Volunteers Promote Sustainable Community

While Xanterra South Rim employees at **Grand Canyon National Park** are required to live in housing within the park, most of them consider it one of the benefits of their jobs. Many of the concession employees also realize the perk of such beautiful scenery is accompanied by the responsibility of protecting the natural environment and supporting the local community.

With this responsibility in mind, Xanterra Parks and Resorts® South Rim employee green team recently implemented a new program to encourage staff to volunteer for environmental projects. The main focus of the program is to identify and advertise volunteer opportunities both in the park and in the greater Grand Canyon area. Flyers were distributed to all Xanterra departments, and a calendar of volunteer events was published in each employee newsletter. Employees were asked to track the number of hours they volunteered. More than a dozen employees received specially marked name tags and certificates for performing at least 10 hours of volunteer service, and several staff members received further recognition for accruing 25 additional hours of assistance.

More than 70 employees logged almost 550 hours of environmental volunteer work, with more than 50 percent of that time spent assisting in the park's condor nest watch program. Xanterra employees were responsible for one in every seven volunteer hours spent observing a condor chick and recording behavioral data. An additional 174 hours were spent picking up litter in the park or on roadsides. Volunteer time was also logged helping on revegetation and habitat restoration projects organized by other local groups.

While the need for environmental volunteering remains a priority, many Xanterra employees are working in less-publicized roles to contribute to the local community. An informal survey by the concessioner determined that hours volunteered by Xanterra employees on all types of projects totaled almost 2,500 hours a year. The most active employees record about 30 hours a month. The average is approximately 100 hours a year. Tasks are as varied as the people who volunteer. Some donate time as soccer referees and basketball or softball coaches, while others function as members of service organizations. They cook to raise money for social services;

they help out at the local music festival; and they volunteer monthly to photograph animals awaiting adoption at the local kennel.

With a resident population that ranges from 2,500 to 3,500, the South Rim of Grand Canyon National Park fits the definition of a small town. For Grand Canyon to truly fit the definition of a "sustainable community," however, caring involvement is required by many working in supportive roles such as Xanterra volunteers.

Interpreters Bike to Work at Hawai'i Volcanoes

The Division of Interpretation at **Hawai'i Volcanoes National Park** recently purchased 12 Trek® bicycles as an affordable and sustainable mode of transportation for staff and volunteers. For some it is a simple solution to a timely commute between office and headquarters, visitor center, and trailhead. For others it is the vehicle of choice as the NPS moves toward a more sustainable future.

Instead of petroleum, interpreters burn carbohydrates and calories. The aerobic workout from bicycling also reduces stress for those who interact with nearly two million visitors a year. Cyclists note improved strength, balance, and focus, as well as pulmonary benefits for those who are also called upon to fight lava-ignited wildfires and search for overdue hikers. Visible and vital, bikers decongest roads and free up parking. For visitors confined within cars and buses, the sight of a ranger atop a bike sets a positive example of alternative transportation.

The slower pace of a two-wheeler mirrors the more relaxed tempo of island life. Interpreters meander beneath fronds of towering tree ferns and chase the elusive rainbows that form in wisps of volcanic steam. In contrast to the high-decibel drone of combustion engines that drown sounds and squelch solitude, cyclists conserve the natural soundscape. They ride ever-mindful of the unique essence of the park—the chorus of forest birds, the rumble of rock falls, and the echo of traditional drumming during a Hawaiian ceremony.

A solitary spin around Kilauea, the world's most active volcano, reminds staff and visitors alike that the ride is about more than the destination, it is about the journey—a journey toward a more sustainable National Park System.



Top: Volunteers from Xanterra South Rim's green team pick up litter near the Grand Canyon Railway.

Bottom: Xanterra volunteers donate time to a variety of Grand Canyon National Park efforts, including observation of a condor chick hatched in the wild as part of the California Condor Recovery Program.

Opposite: Greening charrette participants at Homestead National Monument of America tour an original 1800s one-room schoolhouse.

Park-Level Environmental Management System Basics

National Park Service environmental management emphasizes goal setting and planning at individual parks for lasting environmental benefits. Eight elements provide the framework of any NPS park-level environmental management system (EMS):

- **Environmental Commitment Statement**
This site-specific document affirms the park's intent to strive for exemplary environmental management by complying with environmental protection laws and using best management practices in all operations.
- **Facility Activities and Environmental Impacts**
Procedures are established, implemented, and documented that consider the potential environmental impacts of all activities.
- **Goals, Objectives, Targets**
Parks identify, quantify, and achieve EMS-related goals. Audits and reviews periodically track progress.
- **Roles, Responsibilities, and Accountability**
Personnel are assigned duties to achieve environmental objectives. Position descriptions include EMS-related responsibilities.
- **Document Control, Record Keeping, and Reporting**
Successful implementation of EMS responsibilities is demonstrated through standard documentation.
- **Communication**
Impacts of park activities are emphasized internally and to the public.
- **Training**
Procedures ensure that personnel understand and are able to perform EMS-related duties.
- **Monitoring, Measurement, Corrective Action, and Management Review**
Audits, evaluation, and corrective actions ensure proper EMS performance.



Greening Charrettes Reinforce NPS Mission

The National Park Service Environmental Leadership Program and the U.S. Environmental Protection Agency have recently hosted greening workshops at **Canaveral National Seashore** and **Homestead National Monument of America**.

The greening charrette kicked off a new phase of environmentally preferable practices at Canaveral. Already a proven environmental leader, the national seashore has now started to develop an environmental management system, a disciplined approach to managing the facility's environmental practices. Although the park presently recycles and compresses 75 percent of all aluminum cans using its own baler, the staff is determined to improve this success rate through increased educational efforts. Workshop participants identified numerous ways that public outreach can help achieve objectives such as improving water quality, promoting alternative transportation, and enhancing the volunteer work force to help support greening efforts. As the park implements the resulting five-year sustainability plan, staff will share information with visitors, partners, and adjacent communities on how to become further involved in greening initiatives beyond park boundaries. Remarking on the success of the charrette, Superintendent Carol Clark commented, "This workshop continues to emphasize Canaveral National Seashore's commitment to the NPS mission to preserve unimpaired our natural and cultural resources for future generations."

One of 20 NPS Centers for Environmental Innovation, Homestead began implementing green technology in the 1980s with the installation of

water source heat pumps. More improvements followed, including photovoltaic systems; procurement initiatives for purchasing biodiesel, gasohol, and ethanol for park vehicles; and formation of a green committee. Priorities identified at the charrette include developing an environmental management system, potential use of wind power, community outreach, and integrating sustainability at a new Heritage Center. Superintendent Mark Engler acknowledged the workshop as furthering Homestead's all-inclusive goal, "to be the best that we can be."

Wilson's Creek Wraps Up Hybrid Technology

A partnership with the U.S. Department of Energy Clean Cities Program and Toyota Motor Sales has put a Toyota Prius® hybrid vehicle on the road at **Wilson's Creek National Battlefield**. The car will be used in the park and the Springfield, Missouri, area by interpretive rangers and other park staff. Driving the vehicle will help educate more than 200,000 annual visitors about hybrid technology and the NPS commitment to exploring innovative ways to better protect, manage, and preserve natural resources. Toyota Motor Sales donated the graphics "wrap" for the vehicle, which features images of the battlefield landscape complete with a cannon and rows of corn. Toyota also provided informational cards for visitors that explain hybrid technology and recognize the park's dedication to environmental stewardship and sustainability. ■

Contributors to this section include Lisa McNeilly, Xanterra Parks and Resorts®, Mardie Lane, Hawai'i Volcanoes National Park, and Ted Hillmer, Wilson's Creek National Battlefield.

Compost Makes Comeback

Composting, a centuries-old technology used in agriculture throughout the millennia, is the natural breakdown process that occurs when organic matter is returned to the soil. Popular with people from presidents to publishers (George Washington was an avid composter and regularly wrote on the subject), composting is the subject of books, websites, and even a Gateway National Recreation Area interpretive program called *Backyard Composting*.

When agriculture became heavily mechanized after World War II, synthetic fertilizers generally replaced the ancient practice of applying manure or composts to maintain soil fertility. However, synthetic fertilizer production is an energy intensive process, and the cost of energy is rapidly rising. Additionally, the cost of landfill space has risen dramatically, especially in urban areas. A resurgence of interest in the time-honored tradition of composting is occurring because of these factors, in addition to the rapid growth of the organic food industry and heightened environmental concerns regarding industrial farming practices.

Check these references for innovations in composting:

- The U.S. Composting Council is involved in education, research, composting and compost standards, and expansion of compost markets. Visit their website at www.compostingcouncil.org.
- **Compost Science and Utilization** is a quarterly journal that focuses on management techniques to improve compost process control and product quality. *Bicycle*, a composting and organics recycling magazine, shows readers how to turn organic residuals into value-added products. Visit both websites at www.jgpress.com.
- For detailed information on the Earth Tub from Green Mountain Technologies, go to www.gmt-organic.com.

From Food to Fertilizer: Compost Counts at Zion Lodge



Organic materials such as food scraps, lawn clippings, and shredded paper turn into compost using an Earth Tub.



Compost applied to landscaping beds enriches soil and allows plant roots to complete the recycling process.

Xanterra Parks and Resorts® composts all of its food wastes, lawn clippings, and shredded paper at Zion Lodge in Zion National Park. Wood shavings procured locally are added into this mix. The technology employed by Xanterra is the Green Mountain Technologies Earth Tub. The Earth Tub is designed specifically for on-site composting of food wastes and is a fully enclosed composting vessel featuring power mixing, compost aeration, and biofiltration of all process air (to keep odors down). These units have been implemented at lodges, resorts, parks, and markets across the nation. The tubs work as a pair—while one unit digests, the other cures the final product.

As is often the case, environmentally preferable practices must also be justified based on their financial merits. The two Earth Tub units cost \$19,000 installed (this includes a concrete pad, storage bin, and electrical hook-up). Earth Tub operation and compost separation and handling involve additional labor of about one or two hours a day. Finished compost product is considered quite valuable and generally saleable. However, an abundant supply of compost exists in the local rural area near Zion National Park. Because of this, Xanterra donates the finished compost to a local pet sanctuary for landscaping and to an organic nursery for out-planting. The concessioner does not presently receive any revenue from the composting operation.

Zion Lodge can process more than 200 pounds of kitchen food waste daily through the two Earth Tubs. Waste diverted from the landfill is estimated at 55,000 pounds each year, resulting in reduced landfill fees of approximately \$5,500

annually (based on a five-year average disposal cost of ten cents per pound). According to these figures, composting at Zion Lodge will pay for itself in fewer than eight years. Estimating the life of the Earth Tubs at 10 years, this gives the composting project a 10-year return on a financial investment of approximately \$8,000.

Composting is just one of the many progressive environmental programs Xanterra has recently implemented at Zion Lodge. In January of 2005, Zion Lodge announced a renewable energy commitment, procuring more than 50 percent of their electricity from wind and locally installed photovoltaics. Lighting at the lodge has been retrofitted to energy-saving compact fluorescent and T-8 lighting. During a recent kitchen remodel, Xanterra removed an old diesel-fired boiler and replaced it with a smaller, more efficient propane hot water system. This not only saves energy, but removes a diesel fuel tank from the park. Other environmental programs at Zion Lodge include using propane- and battery-powered utility carts and hybrid vehicles, implementing comprehensive recycling, and offering a selection of sustainable cuisine and retail merchandise.

Xanterra Parks and Resorts® envisions a rich and fertile future for composting, with Earth Tub technology integrated into many company operations. The concessioner also hopes to expand the composting program in the future to Bryce Canyon National Park and the North Rim of Grand Canyon National Park. ■

Written by Brian Stewart, Environmental Affairs, Xanterra Parks and Resorts®.



It's Alive!

Story and Photos by Doug Curtis

Thirty-seven percent of the nation's capital is presently covered with impervious surfaces such as roads, buildings, and parking lots. Serious impairment to streams usually begins when the amount of imperviousness in a watershed reaches 10 percent. Planners are attempting to utilize a number of tools to protect watersheds from the pressures of increased development, but one that is often overlooked in the United States—until recently—is a “green” roof. This technique can be used on structures with flat or sloped roofs to provide additional green space and mitigate environmental degradation related to an ever increasing amount of impervious surfaces.

The National Park Service Center for Urban Ecology in Washington, D.C., which staffs the Natural Resources and Science Division for the National Capital Region, has a vested interest in using sustainable technology that reduces and mitigates the adverse impacts of impervious surfaces in an ultra urban area. The Center for Urban Ecology has taken action to reduce the human-produced, or anthropogenic, impacts on the environment attributable to its facility. A 7,000-square-foot, lightweight, extensive green

roof has been installed to detain storm water, improve insulation properties and conserve energy, prolong roof life, and reduce ambient air temperatures. The “living” roof mitigates the urban heat island effect, fixing dust and particulate matter, while it also provides habitat for birds, bees, and butterflies.

The idea for a green roof for the facility arose after an exchange team comprised of leaders from agencies and nonprofit organizations with an interest in urban watershed management along the Potomac River visited with watershed professionals in Germany. Countries such as Germany have already tackled urban watershed issues similar to those now being experienced in the nation's capital. Germany has long been viewed as a leader in sustainability. For example, policy tools such as an “impervious surface tax,” which requires owners to pay for cleaning storm water runoff attributable to their property, have propelled a national trend toward green roofs. By planting grasses and succulents on roof tops, storm water is absorbed, cleaned, and then discharged slowly into the natural environment. More than five percent of commercial and residential buildings in Germany are estimated to have green roofs.

Top: Creeping thyme grows in a three-inch deep mixture of slate and organic material placed in flats on the roof of the Center for Urban Ecology in Washington, D.C.



Top: Each two-foot-square plastic flat is placed directly on top of geotextile felt pads.

Bottom: Staff members from the Center for Urban Ecology place flats of plants onto the roof of the facility. Once established, the green roof will reduce storm water runoff, increase the building's energy efficiency, and help decrease the urban heat island effect.

Green roofs are divided into two categories, intensive and extensive. Intensive green roofs usually consist of a thick soil or substrate capable of supporting root growth for larger shrubs and trees. Such systems are heavy and can have major structural implications for a building. Extensive green roofs normally feature a thin layer of soil or substrate. Such lightweight systems possess minimal structural implications for a building.

One of the functional constraints of retrofitting a building with a green roof is the weight-bearing capacity of the existing roof structure. For this reason, lightweight, extensive green roofs (soil media usually two to four inches thick) are becoming increasingly popular for their ability to provide environmental benefits and extend roof life. However, before a green roof for an existing structure is considered, a professional structural engineer must conduct a structural analysis of the roof truss system to ensure that the structure can withstand the extra loading. The Center for Urban Ecology staff members were initially disappointed to learn that a section of the building with 2 x 12 in wood trusses would not support a green roof, but they were delighted to hear that the larger part of the building with steel web joists was strong enough to support the additional loading.

Green roofs consist of a wood deck overlying steel web joists, a rigid insulation board tapered to provide positive drainage to gutters, an 80 mm PVC roofing membrane, a drainage mat, and geotextile felt. Plants and soil media are contained in 2 x 2 ft plastic flats that hold three inches of planting media. The flats are placed directly on top of the geotextile and are heavy enough to weight the felt down in the wind. Planting medium consists of 75 to 85 percent inert, expanded slate with 15 to 25 percent organic material. This inert material is important to the long-term success of the green roof. Over time an all-organic soil will decompose and erode. To eliminate the burden for the continuing loss of soil, a durable, lightweight planting medium is used to prevent compaction and maintain the necessary void space for water retention and healthy plant roots. Green roofs are a long-term investment, so successful designs eliminate the need for ongoing maintenance such as replenishing soil and plants.

A compelling sustainable design argument for green roofs is that they prolong the life of conventional roofs by protecting them from ultraviolet radiation and extreme temperature fluctuations—the two primary sources of roof membrane degradation. On a conventional asphalt roof, for example, annual temperatures may fluctuate 170 degrees Fahrenheit. Green roofs,

however, dramatically reduce the temperature differential. A study conducted by the Chicago Department of Environment found that on a 100-degree day, the surface temperature of a blacktop roof reached 165 degrees Fahrenheit, while the temperature of a green roof remained only 85 degrees. Green roofs not only save money by lengthening the life span of roofing membranes, they also yield short-term savings by insulating buildings and reducing energy use. Research shows green roofs can cut energy costs in half in summer and by 25 percent in winter.

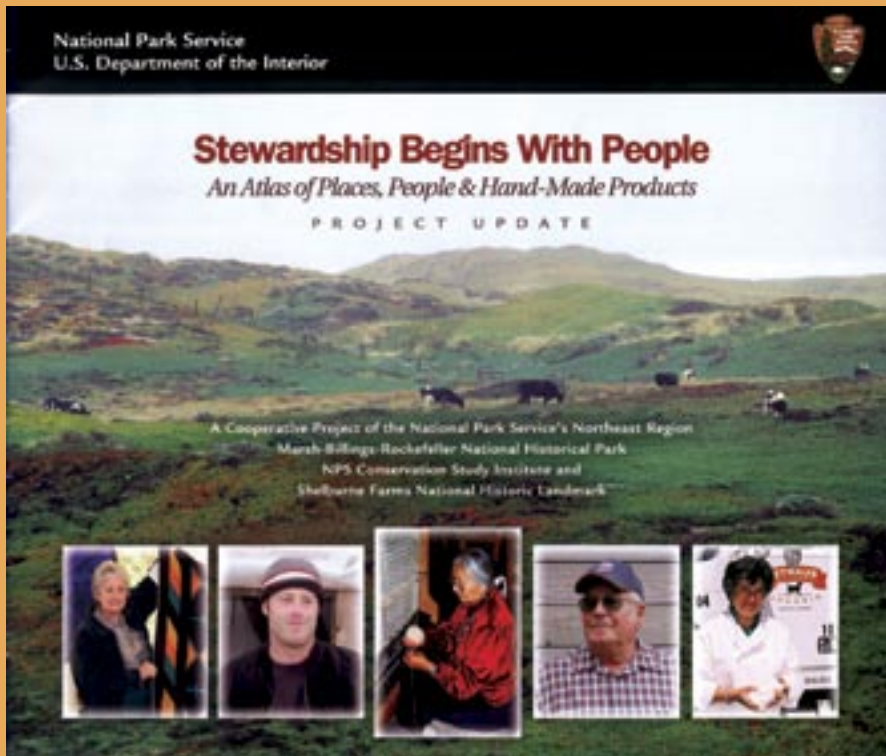
Ed Snodgrass of Emory Knoll Farms, the grower that provided plants for this project, has been testing and cultivating green roof plants for the past five years at his nursery north of Baltimore, Maryland. “The Germans have been testing and building green roofs for the past few decades,” says Snodgrass. “But their climate is milder than ours, and some plants that succeed in Germany often wither under the hot summer conditions here in the United States.” Snodgrass specified the soil and selected the plant palette for the Center for Urban Ecology green roof project. Seventeen species of plants were selected, including sedum, phlox, thyme, and succulents. About 14,000 plugs were installed at eight plants per flat. Certain plants were selected for their aesthetics and year-round interest; however, the most important variable guiding plant selection was long-term viability.

A green roof is easier to realize than most would believe. The weight of an extensive green roof is similar to that of gravel ballast, so structural upgrades are not always necessary. An extensive green roof with three to four inches of soil will reduce storm water runoff, enhance the energy efficiency of a building, and add green space.

The design simplicity of a green roof and its significant benefits offer great potential for many rooftops in U.S. cities. As people become more familiar with the technology and performance of green roofs, they can overcome their resistance to install green roofs because of unsubstantiated fears that they will leak or prove too heavy with the additional loading. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED™) green building rating system provides incentives for the use of green roofs. The program's “Sustainable Sites” category encourages the use of green roofs as an integrated component of storm water management, with additional benefits that can be gained for reducing the urban heat island effect. ■

Doug Curtis is a Regional Hydrologist at the NPS Center for Urban Ecology.

Atlas Project Highlights People, Places, Products



An atlas project update is available at www.nps.gov/csi/new/atlas.htm. Contact rolf_diamant@nps.gov or nora_mitchell@nps.gov to contribute information for the final publication.

Soon to be published by the NPS Conservation Study Institute (CSI), *Stewardship Begins with People: An Atlas of Places, People & Hand-Made Products* offers a fresh perspective on sustainability. The atlas highlights friends, neighbors, and communities who practice a stewardship ethic and a commitment to sustainability in and around our national parks, heritage areas, and national historic landmarks. People are featured who preserve authentic traditional cultures and significant cultural landscapes through their work and the products they make. Publication of the atlas will help build a knowledge network among park managers, partners, concessioners, and cooperators, and provide information for consumers about products that contribute to sustainability and promote stewardship of special places.

The atlas project is a collaboration between CSI, Marsh-Billings-Rockefeller National Historical Park, the NPS Northeast Regional Office, and Shelburne Farms National Historic Landmark. Scheduled for availability throughout the National Park System in late 2005, the atlas “acknowledges and honors the contributions of citizen-stewards who are part of the larger conservation story,” according to Rolf Diamant, Superintendent at Marsh-Billings-Rockefeller.

The atlas benefited from cross-pollination between the NPS, the Italian Nature Conservation Service, and Lazio Regional Park Agency, organizations collaborating under an international agreement to promote best practices in stewardship of national parks and sustainable tourism. The Italian parks, with Slow Food Italia (*see page 22*), produced an “atlas” to describe “artisanal” and regional food products, and the parks where the food is grown or made. While the Italian atlas primarily features products, the NPS publication focuses on people, stewardship, sustainability, and collaboration between parks and gateway communities, as in the following examples:

Cuyahoga Valley National Park

Leasing farmsteads through the Cuyahoga Countryside Initiative, the park’s effort to revitalize an Ohio landscape is well underway with three pilot enterprises demonstrating environmental stewardship while preserving traditional agricultural practices (*see page 26*.)

Canyon de Chelly National Monument

In 1864 the U.S. Army drove the Navajo people from their homelands, destroying irrigation canals and orchards. The Navajo returned in 1868, and brought orchard stock obtained from the Hopi. Canyon de Chelly National Monument is now home to 80 Navajo families, some of whom produce heirloom peaches (*see page 18*.)

Haleakala National Park

Formed to revive Hawaiian culture and stewardship practices, the nonprofit Kipahulu ‘Ohana friends group has restored fourteen l’oi, or taro patches, to active production. The friends group plans to restore the entire ‘ahupua‘a, or tract of land from the mountains to (and including) the sea, to a self-sustaining community circa 1778-1848. This includes rebuilding traditional agricultural and aquacultural elements, removing invasive species, and reintroducing native, endemic, and Polynesian plants.

Hubbell Trading Post National Historic Site

This Arizona park fulfills its stewardship mission by supporting the local economy through collaboration with the Navajo Nation and Western National Parks Association. Traditional weaving demonstrations and semiannual auctions help educate visitors about Navajo culture.

Point Reyes National Seashore

Park environs support oyster aquaculture, ranching, and dairy operations that provide food for the San Francisco Bay Area. Production from its historic dairy district and open pastures reconnect people to their heritage in a landscape that cultivates sustainable agricultural practices. ■

“The true importance of Marsh, Billings, and those who follow in their footsteps, goes beyond simple stewardship. Their work transcends maintenance. It involves new thought and new action to enhance and enrich and even repair errors of the past.”

—Laurance S. Rockefeller



Legacy of Stewardship

MARSH-BILLINGS-ROCKEFELLER NATIONAL HISTORICAL PARK

By Kevin Leichner

Whose woods these are . . .

For many visitors to Marsh-Billings-Rockefeller National Historical Park, a tranquil meander along a spruce-scented trail summons poetic impressions of days gone by. The sweep of easy wind rolls down from the rounded summit of Mount Tom, wrapping around the placid water of a picturesque pond while somewhere near the village, a horse gives his harness bells a shake. It is easy to envision Robert Frost stopping by these quiet woods—this forest offers as many opportunities for inspiration today as it has for the past 200 years. Yet this is not a place where time has stood still. Change occurs in every chapter of the compelling story here, where 20 miles of historic carriage roads converge to make a difference in the lives of educators, students, artisans, and others on a path to discovery, reflection, and renewal.

Marsh-Billings-Rockefeller National Historical Park connects the Currier and Ives setting of Woodstock, Vermont, to the 550-acre Mount Tom forest, one of the earliest surviving examples of planned and managed reforestation in the United States. Closely associated with the lives of prominent American conservationists George Perkins Marsh, Frederick Billings, and Laurance S. Rockefeller—each a contributor to a legacy of continuous, careful forest stewardship—the park is a living exhibit that conveys the emergence of a conservation ethic and illustrates the evolution of forest stewardship in America, from the original models of scientific forestry borrowed from 19th-century Europe, to contemporary practices of sustainable forest management.

Visitors can hike along a network of carriage roads designed and built under the direction of Frederick Billings to showcase his early forestry experiments and provide breathtaking views of the countryside. Winding amid plantations of Norway spruce, white pine, red pine, and European larch set out as early as 1874, carriage roads and trails lead into the depths of rich hardwood stands of native sugar maples, beech, and birch trees and through agricultural pastures punctuated by old stone walls. Scattered along these routes are 400-year-old hemlocks, spared the ax to witness the march of history and the processes of environmental devastation and recovery that shaped this provocative forest—woods that ultimately spurred the conservation movement.

A Legacy Lives On

This was the boyhood landscape of George Perkins Marsh (1801-1882) who experienced the early deforestation of Vermont as a young man.

Later, as President Lincoln's ambassador to Italy, he would advocate in his momentous 1864 book, *Man and Nature*, for humans to "become a co-worker with nature in the reconstruction of the damaged fabric." Marsh believed commerce and conservation could be complementary forces in the cause of stewardship. Published in the midst of the Civil War and a contemporary to Charles Darwin's *On the Origin of Species*, *Man and Nature* became one of the founding texts of America's conservation movement.

Inspired by Marsh, Frederick Billings (1823-1890), who made his fortune in the West, returned to Vermont and established a farm and forest on the former Marsh property that would serve as a model of land stewardship. Billings had a vision of social improvement and rural recovery based in part on reforestation, agricultural improvement, and conservation. As Billings planted trees by the thousands, he simultaneously developed the carriage roads system to demonstrate his pioneer forestry work to the public and enhance his new estate's productivity and beauty.

Billings' work was continued and expanded by his wife, Julia, and daughters, Elizabeth, Mary and Laura, and his grandchildren. In 1934 Mary French, Billings' granddaughter, married conservationist Laurance Spelman Rockefeller. Together, Laurance and Mary infused the property with a new vision of stewardship emphasizing heritage education. They created Billings Farm & Museum in 1983 as an operating dairy farm, maintaining a tradition of agricultural excellence and sustainability. In 1992 the couple gave their residence and surrounding forest lands to create the Marsh-Billings-Rockefeller National Historical Park.

. . . I think I know.

Park Values Transparency and Accountability

The new National Park Service site opened to the public in 1998 with a commitment to interpret the history of American conservation and continue the tradition of demonstrating contemporary stewardship practices. Its commitment to sustainable management was reinforced by visionary enabling legislation, careful planning, and strong partnerships with the local community. One example of this partnership is the national park's collaboration with the Vermont State Forester, local landowners, U.S. Forest Service, and nonprofit partners to offer an annual series of "Working Woodlands" workshops. Workshop participants engage in hands-on sustainable management practices, invasive plant control, trail maintenance, and other activities.



A ranger prepares local school group students for an exploration of the Mount Tom forest at Marsh-Billings-Rockefeller National Historical Park. For further information about the park, go to www.nps.gov/mabi.



PHOTO BY JON GILBERT FOX

Top: Logs are transformed into lumber during a portable sawmill demonstration at the Forest Festival.

Bottom: Children learn how to craft writing clipboards out of wood harvested from the Mount Tom forest.



PHOTO BY JON GILBERT FOX

Many park resource management activities are interpreted, and many are participatory. The annual “Forest Festival” mixes visitors of all ages with local foresters, ecologists, sawyers, mill operators, and artisans for everyone to demonstrate their skills and commitment to sustainability. Visitors can walk the woods with a professional forester, see a portable sawmill in operation, and watch as a crafter transforms a block of sugar maple wood into a beautiful bowl while discussing the importance of sustainability to the profession. Youngsters can make wooden clipboards for sketching and writing their impressions from the forest. A variety of sustainably harvested wood products are on display in the park’s Carriage Barn Visitor Center,

practices, and local craftsmanship. Visitors can literally carry this lesson home with them by purchasing a bowl, pen, or other product made of wood from the park. Such items are sold in the park’s bookstore, operated by Eastern National, the park’s cooperating association.

These products may soon carry another label—a “green” certification logo of the Forest Stewardship Council (FSC), an association of nonprofit conservation organizations and forest product businesses. Participating public and private forests are evaluated by FSC and other forest certification organizations, and are annually audited on criteria related to ecological health, sustainable management, and community well-being. Third-party forest certification is a fast-growing development in forest conservation, assuring that wood products originate in places with consistent, credible, independent verification of best sustainable practices. “This approach to public transparency and accountability is good not only for Marsh-Billings-Rockefeller National Historical Park,” says Superintendent Rolf Diamant, “but hopefully, it will encourage a broader dialogue in the NPS about using

The woods are lovely, dark and deep.

illustrating the concept of “value-added conservation,” the process by which economic value can be added to products because of their association with a special place, sustainable management

more certified wood in our construction projects and how we, as institutional consumers, can do a better job of aligning our procurement practices with our organizational values.”



Forest Festival activities at Marsh-Billings-Rockefeller National Historical Park include woodworking demonstrations by local craftspeople.

When the estate's historic carriage barn was renovated as a visitor center and headquarters in 1999, the park used white pine from its own forest for most of the interior carpentry. Some exhibit furnishings were also constructed from park hardwoods by local craftspeople. Energy-efficient lighting, recycled wood, and natural products and finishes were applied throughout the building. Marsh-Billings-Rockefeller is currently seeking gold Leadership in Energy and Environmental Design (LEED™) certification from the U.S. Green Building Council, Inc. for the renovation of an 1876 barn and construction of a new collaborative conservation learning center. Scheduled for completion in 2006, the project will almost exclusively use wood harvested from Mount Tom and incorporate the latest principles of sustainable design.

The certification process has prompted a broader study by the park and the NPS Conservation Study Institute (located at the park) of the connections between places, people, and special products. The forthcoming publication, *Stewardship Begins with People: An Atlas of Places, People & Hand-Made Products* (see page 9), will highlight good stewardship examples and related authentic products that advance conservation and sustainability in and around national parks. The project is partly inspired by the park visitor center's interactive exhibit on "Celebrating Stewardship," a series of audio interviews that emphasizes the diversity of modern conservationists from urban gardeners to ranchers.

Young People Become Citizen-Stewards
Innovation is a high priority at the park. "We are incubating new approaches to sustainability on a variety of scales," observes Resources Manager

Christina Marts. Middle school math students recently completed a field program inventorying the park's forest and represented their work using bar graphs, frequency tables, line plots, and histograms. Participants then transformed their

... I have promises to keep ...

findings into a recipe for "Carriage Trail Mix," where the proportion of ingredients corresponded to their forest inventory compositions. The students marketed the mix in community stores with an attached interpretive label about the national park and forest stewardship. Proceeds were donated to a local nonprofit conservation program. "When you have young people learning and practicing math, commerce, conservation, and sustainability," reflects Marts, "anything is possible!" Marts exercises this "service-learning" philosophy with summer youth work programs hosted with the Student Conservation Association and the Vermont Youth Conservation Corps. These students work in the park on conservation projects and host workshops for the community on topics such as invasive and exotic plants, a problem the park shares with its neighbors.

Park Proceeds Along Distinctive Path

In many parts of the country, polarization over forest management and conservation is commonplace; however, in Vermont, the park is working to cultivate an open dialogue and demonstrate a better path to sustainability and stewardship. Marsh-Billings-Rockefeller National Historical Park is not only a productive and sustainable landscape of great beauty; it is also a place that contributes to a broader conservation mission. This is hopefully what Laurance S. Rockefeller had in mind when he said, "the message and vision of conservation stewardship and its importance for the future will, once again, go out across the nation from the hills of Vermont." ■

... And miles to go ...



Carriage Barn Visitor Center interiors feature white pine cabinetry crafted mostly with wood from the park's forest.



Developed by local math students, a recipe for Carriage Trail Mix includes nuts, raisins, and stewardship.

National Park Service Institute Explores Conservation Strategies

Successful and sustainable stewardship of national parks and other places of heritage depends on broad-based partnerships, increased community engagement, and a commitment to the future. The National Park Service established the Conservation Study Institute (CSI) in 1998 to help the NPS and its partners stay active in the evolving field of conservation and to develop sophisticated, long-term partnerships using new tools and strategies. Located at Marsh-Billings-Rockefeller National Historical Park in Woodstock, Vermont, CSI promotes outreach, dialogue, and original research about conservation history and stewardship of parks, landscapes, and communities.

ship experience to reflect on lessons learned, and to collectively identify insights and strategies. At a recent partnerships workshop, Superintendent Laura Gates of Cane River Creole National Historical Park commented that “partnerships are key for any kind of concept to flourish, and partnerships are built on trust.” Executive Director Greg Moore of the Golden Gate National Parks Conservancy reflected that the workshop showed him that “partnerships really allow for broader community and societal ownership of what the national parks are all about . . . for people from a variety of backgrounds. This creates a richer concept of what national parks can be and should be for the future.” An Institute publication, *Collaboration and Conservation: Lessons Learned from National Park Service Partnership Areas in the Western United States*, summarizes the findings of this workshop.

To illustrate the tradition and richness of partnerships in the National Park Service, the Institute collaborated with cooperating association Eastern National on a publication, *Branching Out, Approaches in National Park Stewardship*. This booklet reviews management innovation throughout the history of national parks and recognizes the significant role partners play in meeting the challenges of resource stewardship. A passage from the publication states, “partnerships that combine a landscape perspective with a growing community-based commitment to stewardship have become critical factors in the sustainability of all national park areas.”

Engaging Communities

The Institute provides opportunities to become engaged in stewardship by demonstrating and evaluating strategies that forge an enduring connection between people, their communities, and public lands. Land managers and gateway communities now collaborate through a program called the Gateway Communities Leadership Network, cosponsored by the Institute and a consortium of partners. This effort enables land managers and their local partners to identify and address issues of mutual concern, resulting in improved relationships and long-range planning.

In response to the National Park System Advisory Board Report, *Rethinking the National Parks for the 21st Century*, NPS Director Fran Mainella and

“We work to support practitioners in their efforts toward sustainability and stewardship,” explains Conservation Study Institute Director Nora Mitchell. “But we are not just about parks. We also work to promote economic sustainability based on stewardship practices in

gateway communities.” The Institute’s mission is to explore new directions in conservation by sharing best practices and cultivating leadership. A variety of Institute programs creates opportunities to consider lessons learned, exchange leadership experience, and maintain dialogue about conservation.

Promoting Partnerships

The Conservation Study Institute assembles individuals to examine conservation efforts and create vital connections for sustaining heritage conservation among a broad set of partners. Such partnerships cross disciplines, boundaries, and sectors to accomplish large-scale conservation, placing national parks in a landscape context.

To draw on the insights and experiences of seasoned practitioners, the Institute convenes workshops for people with substantial partner-



Above: Conservation Study Institute program participants represent diverse geographic locations. Programs are hosted at additional locations throughout the country in cooperation with a growing network of partners.

Opposite: Workshops explore ways to enhance the use of national parks as learning environments for place-based education.

the National Leadership Council initiated a seminar series designed to explore state-of-the-art education theory and practice, and to consider opportunities for the National Park Service to expand its educational capacity. The Conservation Study Institute performed an important role in organizing this seminar series, inviting scholars and experts from outside the NPS to present and discuss a variety of initiatives and current research with NPS leaders. One result was the creation of the National Park Service Education Council, an interdisciplinary advisory forum established to guide implementation of national actions. The publication *Renewing Our Education Mission* summarizes the national framework for an education program, including priority actions.

Cultivating Leaders

The Institute cultivates leadership that is reflective and collaborative, embraces innovation, and guides change in response to new directions in conservation. The Superintendents' Leadership Roundtable is one such program that allows managers to share experiences and learn about current leadership concepts and research.

National Park Service superintendents share similar challenges: demanding schedules, high community profiles, resolving complicated and contentious issues, and frequently, a sense of isolation. Since the Institute initiated the Superintendents' Leadership Roundtable, four groups of twelve superintendents have met to exchange thoughts on contemporary management prac-

tices. The content of the program is useful; yet, participants remark that what they value most is open dialogue, building mutual trust and long-term relationships with peers, and a chance to reflect on their work. One individual comments, "It is the best learning experience that I have had since becoming a superintendent."

Analyzing Trends in Conservation

By examining new directions in conservation, CSI helps people stay informed on best practices. As the field of conservation evolves, the Institute offers opportunities for evaluation and discussion of emerging strategies.

"What is our conservation legacy from previous generations? What does the future look like for conservation?" These are questions considered during a national symposium, "Reconstructing Conservation: History, Values, and Practice." Fifty invited scholars and practitioners participated, resulting in publication of a book, *Reconstructing Conservation, Finding Common Ground* (Island Press, 2003) and an Institute report, *Speaking of the Future: A Dialogue on Conservation*.

Reflecting on these successes from the Institute's first six years, Mitchell observes, "It is our hope that our work at CSI supports the NPS and its partners in becoming increasingly effective and creative in meeting new challenges, and more open and responsive in building collaboration and commitment for stewardship of our national system of parks and special places." ■



PHOTO BY BARBARA SLABY

CSI Publishes Learning Series

Information about conservation history, current practices, and future perspectives is available from CSI through distance learning and the Conservation and Stewardship Publication Series. These publications are available on their website at www.nps.gov/csi.



Collaboration and Conservation: Lessons Learned from National Park Service Partnership Areas in the Western United States provides a summary of the CSI-sponsored partnership workshop.



Branching Out, Approaches in National Park Stewardship reviews management innovations and partnership roles in resource stewardship.



Renewing Our Education Mission summarizes actions identified in a national framework for NPS education.

Shelburne Farms

~ GROWING FARMS, GROWING MINDS ~

By Kevin Leichner

Shelburne Farms is a 1,400-acre working farm, national historic landmark, and nonprofit environmental education center that collaborates extensively with Marsh-Billings-Rockefeller National Historical Park and the National Park Service Conservation Study Institute to advance stewardship programs. This nonprofit enterprise cultivates a conservation ethic in students, teachers, and the general public by teaching the stewardship of natural and agricultural resources and demonstrating rural land use that is environmentally, economically, and culturally sustainable.

Below: Workers conduct a haying operation on Lila Vanderbilt Webb and Dr. William Seward's turn-of-the-century model farm. Hay produced at Shelburne Farms today supports a dairy of 125 Brown Swiss cows.

HISTORIC PHOTO COURTESY OF SHELburne FARMS

Opposite top: Participants in the *Writing Shelburne Farms* program explore the natural and cultural history of place while learning about farm operations and the relationship between people and the land.

Opposite middle: Students at Shelburne Farms learn how the enterprise produces 100,000 pounds of award-winning cheddar cheese annually.

Opposite bottom: Participants in the *Pasture to Palate* program learn about the land, organic pasturing, care of cows, and milking by visiting a network of local organic farms.

Located on the shores of Lake Champlain opposite New York's Adirondack Mountains, Shelburne Farms was originally an estate belonging to Dr. William Seward and Lila Vanderbilt Webb. It was a contemporary of several model farms for "scientific agriculture" that were built in various parts of the United States in the late 1800s and early 1900s, including Frederick Billings' Farm in Woodstock, Vermont.

"Since the National Park Service arrived in Vermont," explains Megan Camp, Shelburne Farm's Vice President and Director of Programs, "we have developed a relationship with Marsh-Billings-Rockefeller National Historical Park and the NPS Conservation Study Institute that has

opened up a whole new network and set of resources we would not otherwise have had. We have a unique, complementary partnership." In fact, Shelburne Farms was one of the founding partners of the Conservation Study Institute, and also a partner with the NPS on several central initiatives, including *A Forest for Every Classroom* and the forthcoming national publication, *Stewardship Begins with People: An Atlas of Places, People & Hand-Made Products* (see page 9). *A Forest for Every Classroom* is an intensive professional development program for educators that integrates hands-on explorations which address concepts in ecology, sense of place, stewardship, and civics. Collaboration on the atlas project was a natural for Shelburne Farms, whose cheese makers produce an award-winning farmhouse cheddar using fresh, raw milk from a purebred herd of Brown Swiss cows raised on the property using environmentally friendly rotational grazing.

Shelburne Farms has cultivated strong local support from frequent visitors. Megan Camp credits this to the diversity of experiences available. "We've encouraged community participation in the rhythms of nature and farm life," she says. Schoolchildren visit the farm to learn about planting and raising crops, caring for livestock, and maintaining the land. The farm also serves as important green space for area residents.



Programs at Shelburne Farms demonstrate an ability to integrate stewardship with education and recreation. *Forest to Furniture* uses 400 acres of certified forest on the property as an outdoor classroom. Like *A Forest for Every Classroom*, this program offers “place-based education,” learning rooted in the local community, culture, and environment. Students focus on community interests while engaging in activities that build citizenship. Participants in the *Forest to Furniture* program learn about sustainable forestry and observe timber planting, harvesting, milling, and wood craftsmanship. *Forest to Furniture* also introduces students to *Vermont Family Forests*, a partnership of small forest landowners, including Shelburne Farms, whose woodlands have been collectively certified by the Forest Stewardship Council. Working together, *Vermont Family Forests* has produced wood for construction of the new Bicentennial Hall at nearby Middlebury College.



It is not surprising that Shelburne’s dual commitments to local sustainable agriculture and education merge in another pioneering initiative, *Growing Farms, Growing Minds: The Burlington School Project*. Shelburne Farms works with school administrators from Burlington, Vermont’s largest city, to buy local, organically raised food for school lunches through partnerships with area farmers and agricultural producers that are part of the Vermont Fresh Network. Food produced within Burlington’s “foodshed” is delivered to Burlington schools, including produce, milk, and cheese from Shelburne Farms. Critical thinking regarding “food system issues” is reinforced by local food producers who visit classrooms and help develop curriculum. This project allows educators to address social and health concerns—quality food, proper nutrition, childhood obesity—and stewardship concepts such as sense of place, and farmland conservation.



Integral to Shelburne Farms’ success is its entrepreneurial character. “Program support enterprises,” include cheese making, a mail order catalog, farm store, inn, and restaurant that provide nearly 85 percent of Shelburne Farm’s operating revenue. “Sustainability must be economically viable, environmentally sound, and support quality of life,” reflects Camp. “We see a heightened interest and awareness in stewardship of the land. We see young people realizing that food is not just in the cafeteria, but that it starts on a farm, just as wood is not only inside a house; it starts in a forest.” ■



Kevin Leichner, a Public Affairs Specialist at National Parks of New York Harbor, collaborated with Marsh-Billings-Rockefeller NHP, CSI, and Shelburne Farms on articles appearing on pp. 9-17.

PHOTOS BY MARSHALL WEBB

Didzétsoh:



Farmland and orchards vital to the Navajo in Canyon de Chelly National Monument are being lost to erosion, lack of water, invasive vegetation, and soil deterioration. NPS PHOTO

Opposite: A peach harvest typical of the 1950s dries in the sun against a canyon wall in this Laura Gilpin photo from "The Enduring Navaho" (University of Texas Press, Austin, TX, 1968). PHOTO COURTESY OF AMON CARTER MUSEUM

the Peaches of Canyon de Chelly

By Tara Travis

*It's August 2001 and I am eating a canyon peach (*Prunus persica*); it is small (about the size of an apricot), surprisingly firm, and sweet. Ten years ago such a treat might bring pleasure, but not conscious conservation, as I make each bite last. The brown lunch sack that sits on my counter is about half filled with canyon peaches. It was given to me by Navajo farmer and NPS employee Dan Anagal. Sacks of peaches are reserved for relatives, and this gift represents a fortunate exception. Now spring 2005 is upon us, and I may not receive a sack this year. Crops have dwindled to the point where even family members have to share.*

—TARA TRAVIS, NPS ETHNOHISTORIAN

Greetered by profusions of pale pink blossoms outside the National Park Service visitor center east of Chinle, Arizona, spring visitors to Canyon de Chelly National Monument may wonder how peach trees are associated with this timeless landscape. Although their blooms are ephemeral, peach trees endure as an emblem of the canyon community, an important cultural symbol of survival among Navajos of Canyon de Chelly, representing both persistence and renewal in the face of political and ecological challenges. Considering the cultural significance of peaches to the Navajo, declining orchard production in Canyon de Chelly is disturbing—especially to the approximately 80 Navajo families that make their home within the boundary of the national monument. Because of this, the NPS is working with the Navajo people to assist the community in reversing the decline in production.

Navajo Homeland Yields Sweet Harvest

Perhaps the oldest continually inhabited place in North America, Canyon de Chelly contains evidence of American Indian occupation spanning 5,000 years. Ancestral Puebloan people began to farm in the canyon about 2,500 years ago, and farming remains a core activity of the Navajo community. Navajo farmsteads nestle below or adjacent to ancient architectural complexes, and traditional histories and family memories continue to be tied to special canyon places. In 1925 prominent southwestern archeologists expressed concern about the preservation of ancient archeological resources in the canyon. When the matter was brought before the Navajo Tribal Council, it became apparent that Navajos from the area were equally troubled by increasing numbers of visitors digging and removing fragile remnants of the past. In 1931 Canyon de Chelly became a national monument whose land is held in tribal



trust. This resulted in a unique partnership that has continued to evolve and expand over time. The overall canyon environment remains an area of joint decision-making while the National Park Service focuses primarily on the preservation of the “cultural resources.”

The Navajo place name for Canyon de Chelly is Tsegi, or *Tséyí*, the canyon system located in the center of the Navajo, or *Diné*, homeland. For centuries Tsegi has been regarded as the bread basket of the Navajo, who use mountain water from the nearby Chuska range to farm the flooded

alluvial terraces of Canyon de Chelly. Select crops, or *cultigens*, have included large areas of corn, wheat and alfalfa, and family plots of melons, pumpkins, and beans. Peach orchards, however, are the canyon’s notable harvest. During field work in the 1930s, ethnographer W.W. Hill observed that canyon peaches (*Prunus persica*) were traded extensively. Navajos from throughout the region would come to the canyon to trade meat and “. . . baskets, leggings, and buckskins” for ripe peaches. He noted that a sack full of dried peaches was worth five sheep. People from other parts of the reservation, now in their sixties, still remember walking down the canyon’s White House Trail in the 1950s to trade family articles for dried canyon peaches.

Given the delectable quality of a canyon peach, local recipes for peach stew abound. Herbert T. Yazhe, the first Navajo superintendent of the national monument, fondly remembers the peach stew of his youth. He recalled that his family would use a traditional Navajo stew pot—a conical shaped vessel made of local clay—to cook peaches in a broth until the stew thickened into a soft mass of sweetness. Archeologists have even found historic Navajo pottery in the canyons that is heavily glazed from peach stew drippings.



Heavily laden with delectable fruit, peach trees in Canyon de Chelly grow next to canyon walls where they can receive valuable water runoff.

Opposite: Peach blossoms greet spring visitors to Canyon de Chelly National Monument. PHOTO BY JENNIFER LAVRIS

PHOTO BY TARA TRAVIS

Canyon Peaches Remain Steeped in History

Brought from Europe to the Americas by the Spanish in the 1600s, some histories indicate that canyon peaches are the product of exchange between Navajos and Hopi. In 1977 geographer Stephen Jett published an article on fruit arboriculture among the Navajo that detailed various accounts of how and when peaches were introduced to Canyon de Chelly. Ethnographer Alexander M. Stephen postulated during the late 19th century that the Asa Clan (of Jémez, New Mexico, origin who migrated to the Hopi mesas) first introduced peaches to the inhabitants of Canyon de Chelly in the early 1700s. Jett also noted that the Rio Grande Pueblos, Hopi, and Navajo all have a history of peach production and share the southwestern tradition of drying peaches in the sun. Jett detailed historical observations of Navajo agronomy, along with early descriptions of canyon diet. Indeed, those familiar with Navajo country marveled at the canyon farmer's skill. Writing in the *Santa Fe Weekly Gazette* about his journey through Navajo country in the spring of 1853, Indian Agent Henry L. Dodge observed, "... we returned to the valley of the Chella [Canon de Chelly], which we found to be a wide rich valley . . . Their crop consists of wheat, Indian corn, beans, pumpkins and mellons. They have also fine peaches that grow abundantly and of a superior quality"

Eleven years later New Mexico Territorial Governor James Carleton ordered the removal of Navajos from their homeland to Fort Sumner in eastern New Mexico. This failed social experiment forced Navajos and Mescalero Apaches together from 1864 to 1868 at Bosque Redondo, or *Hwééldi*. During the winter campaign of 1863-1864, soldiers targeted large Navajo settlements in Canyon del Muerto and Canyon de Chelly, violently assaulting families,

livestock, and the landscape. These stories are still told by descendants of that period and continue to inform land management decisions today. As Historian Peter Iverson notes, not every Navajo went on the "Long Walk," as the forced march to Fort Sumner is called, but those left behind in the canyons witnessed a "scorched earth" campaign of equal psychological devastation. As Iverson describes it, in the summer of 1864 Captain John Thompson demonstrated a "... determination to destroy the *Diné* environment." Thompson recounted how he and his troops spent days cutting down hundreds of canyon peach trees, describing them as "... the best peach trees I had ever seen in this country." Upon their weary but hopeful return in 1868, Navajos again farmed their canyons and planted peach orchards—storing away family memories from the "fearing time." Over the years Navajo farmers incorporated various crops with the appropriate tools and methods to yield favorable results. The act of farming, helping your neighbor, and instructing young people in old ways, remained a focus of the canyon community and continues to nourish the Navajo today.

Changing Landscape Causes Concern

From 1990 to 1995, in conjunction with an extensive archeological assessment, a survey of the Navajo cultural landscape of Canyon del Muerto (the northern portion of Canyon de Chelly National Monument) was designed and implemented. Historic orchards and features were located again using maps from the 1930s. Existing Navajo farmsteads, fields, and orchards were mapped, photographed, and described. Research also revealed that the Soil Conservation Service had once used Canyon de Chelly as a "Demonstration Area," paying residents to plant tamarisk (*Tamarix ramosissima* and *T. chinensis*) and Russian olive (*Elaeagnus an-*

... we returned to the valley of the Chella [Canon de Chelly], which we found to be a wide rich valley ... Their crop consists of wheat, Indian corn, beans, pumpkins and mellons. They have also fine peaches that grow abundantly and of a superior quality.

—INDIAN AGENT HENRY L. DODGE, SANTA FE WEEKLY GAZETTE, 1853

gustifolia)—now known to be aggressive, invasive species—as part of bank stabilization efforts. This information, along with historic photographs and descriptions by canyon residents of what the canyon “used to look like,” is helping the National Park Service understand physical changes to the traditional community landscape.

A combination of natural and cultural factors has transformed the floor of Canyon de Chelly from a relatively quiet environment to a dynamic, unpredictable setting. Even as late as the 1950s, much of the canyon floor consisted of a broad, meandering stream that flowed year round, bordered by patches of marsh reeds, as well as widely scattered cottonwood and hackberry trees. Fields and orchards were planted in optimal locations throughout the canyon on a seasonal basis. In numerous side canyons, springs and seeps still nourished diverse plants for dietary and medicinal purposes. In contrast, agricultural fields, orchards, and some entire farmsteads are now threatened by extensive erosion, diminished water supply, and advancing exotic vegetation. Today this centuries-old community landscape is in jeopardy.

In 2003 the National Park Service National Leadership Council convened at Canyon de Chelly to examine the NPS role in nurturing cultures and communities. A prominent Navajo farmer, Francis Draper, shared a family story from the Long Walk with the group. He drew attention to his family’s farmstead, composed of a hogan, shade structures, and orchards—a place filled with childhood memories. Draper also identified places choked by invasive vegetation and areas laced by deeply incised drainages, erosion associated with the change in plant composition. Yet, the farmer expressed a renewed sense of hope. He emphasized that working together, the National Park Service, Navajo Nation, and canyon community could keep the old ways going—preserving a way of life that instructs each generation in the *Diné* tradition. By the end of a long day of stories, interest had increased in a watershed restoration effort to help nurture the community of Canyon de Chelly.

To address deterioration of critical park resources and the traditional farms of Canyon de Chelly’s Navajo community, the National Park Service, Navajo Nation, Natural Resources Conservation Service, U.S. Geological Survey, and Colorado State University have initiated two projects to preserve the historical farming landscape and orchards of the canyon floor. The *Watershed Restoration Project*, initiated in October 2003, combines



scientific analysis and applied restoration methods with traditional ecological knowledge of the canyon community. Project elements currently being implemented include a basic watershed assessment; collection of a wide range of data regarding the extent, nature, and environmental consequences of invasive vegetation; small-scale removal of exotic plants in two test locations; and design of a multiyear strategy to identify suitable methods for broad-scale removal of tamarisk and Russian olive.

Momentum for the initiative is provided by strong support from NPS Director Fran Mainella, NPS Associate Director of Natural Resource Stewardship and Science Mike Soukup, and the dedicated partnership of interagency exotic plant management teams. Although the term “restoration” describes the ultimate goal of the project, the basic objective is to reverse the systemic effects of invasive vegetation. In the process, the NPS will be assisting in the preservation of cultural, natural, and community resources, including historic orchards in the canyon. Essentially, successful watershed restoration will reestablish a healthy, sustainable riparian system to meet the needs of park resource management and a new generation of Navajo farmers.

Associated with the park’s restoration efforts is the *Canyon Farms Preservation Project*, which integrates traditional ecological and historical knowledge of the canyon community with a number of old and new strategies. Much of this traditional knowledge focuses on effective use of water, observing and maintaining conditions favorable to native plants, and reestablishing community participation. Canyon de Chelly Superintendent Scott Travis and park staff have already spent several hundred hours meeting with canyon residents about this project. Widely ranging opinions expressed at these meetings reveal that one view is clear—all strongly favor the return of sustainable farms and orchards to the canyons.

Considering how closely the peach trees are tied to the historical memory of the *Diné* at Canyon de Chelly, the National Park Service maintains a special obligation to ensure their environmental survival. These innovative projects demonstrate that efforts to document and preserve the historic farming landscape and orchards of Canyon de Chelly can also embrace concepts that will sustain a way of life and environment well into the future. ■

Tara Travis is an Ethnohistorian with the NPS Office of Indian Affairs and American Culture, duty stationed at Canyon de Chelly NM.

Q&A

Cerise Mayo

SLOW FOOD USA

Slow Food USA is a nonprofit organization which promotes food traditions inherent in the cultural identity of the United States. Promoting land stewardship and ecologically sound food production as part of the broader Slow Food International movement, Slow Food USA works to conserve agricultural biodiversity and protect traditional foods at risk of extinction. Cerise Mayo coordinates national educational programs for Slow Food, including *Slow Food in Schools* and *Terra Madre*.

Sustainability News: What is the connection between Slow Food USA and the national park idea?

Mayo: I think the immediate connection is stewardship for the land. Slow Food encourages those who are building local sustainable food networks and keeping traditional means of growing and producing artisanal foods alive. Slow Food celebrates preservation, biodiversity, and sustainability through a specific lens—pleasure. When you taste an heirloom tomato in late summer or visit a farmer’s market and make a direct connection with a food producer, there is an immediate satisfaction that cannot be substituted or undervalued. This experience is very similar to visiting a special place such as Muir Woods National Monument for the first or fortieth time: it is always life-affirming.

Sustainability News: How does Slow Food USA work to preserve cultural and biological diversity in the United States?

Mayo: Our 140 local chapters (what we call a “convivium”) across the country work to promote our mission and to build sustainable food communities. Each convivium leader holds events in their area that bring people together to share a meal, visit a farm, start a farmer’s market or a children’s “garden to table” project, to name a few examples. Leaders also work to promote our national programs, the *Ark of Taste*, *Slow Food in Schools*, and *Terra Madre*.

A cornerstone Slow Food program that works to defend cultural and biological diversity is the *Ark of Taste*. First developed in Italy where the Slow Food movement began, the USA *Ark of Taste* is



PHOTO BY LEILA LINSEY



A postcard from a recent Slow Food USA membership drive promotes small farms and local food. Members receive invitations to attend local, regional, national, and international events, as well as subscriptions to two publications, *Slow* and *the Snail*.

Information about Slow Food USA, including upcoming events, is available at www.slowfoodusa.org or by calling 718-260-8000. A list of contacts and local convivia is also available online at www.slowfoodusa.org/contact/index.html.

meant to reintroduce Americans to their heritage of traditional foods, and encourage them to seek out these foods and their producers, thereby ensuring survival of the foods. It's an enjoyable task, discovering a raw milk farmstead cheese producer or an heirloom apple grower in your area. We also have recently introduced the RAFT campaign, (Renewing America's Food Traditions), a collaboration with six other organizations which includes Seed Savers Exchange, Chef's Collaborative, Cultural Conservancy, American Livestock Breeds Conservancy, Native Seed SEARCH, and the Center for Sustainable Environments. The coalition is dedicated to documenting, celebrating, and safeguarding the unique foods of North America—not as museum specimens, but as elements of living cultures and regional cuisines.

Slow Food in Schools is a growing national program for children that teaches an ecological approach to food. *Terra Madre*, a meeting of sustainable food communities that was held last fall in Turin, Italy, brought together food producers from around the world, including many from the United States.

Sustainability News: What direction do you think the National Park Service can pursue to sustain cultural landscapes and traditions?

Mayo: Collaborate with people in the community who can help to make the local sustainable food scene flourish. Utilize the knowledge and energy of concerned parents, preservationists, historians, farmer's market organizers, community gardeners, botanists, and farmers. They have a vested interest in preserving cultural landscapes and would be enthusiastic to help.

Sustainability News: How does Slow Food USA work to educate children about sustainability?

Mayo: With more than 20 "garden to table" projects across the country, *Slow Food in Schools* helps children develop an appreciation for real, wholesome food and an understanding of sustainable food practices.

Children are making a direct connection to their food source through this program. Each convivium that establishes a project determines the best way to serve children in that community, whether it is an in-class taste education lesson, revising what is served in the school cafeteria, planting a school garden, visiting farms, or an after school cooking or gardening project. In Ojai, California, there is a wonderful program called *Food for Thought* where they have set up salad bars for elementary school lunches sourcing from local farmers. It has proven so popular that it will soon

be in all Ojai elementary schools and high school students have now formed a student committee to establish the program in their cafeteria. Here in New York City, we have started an after school project called *Harvest Time in Harlem* that brings sustainable producers, chefs, and nutritionists to teach third and fourth grade students how to cook and where to find quality seasonal food.

Slow Food USA also reaches out to our 12,000 members nationwide who can help change what is served in schools throughout the country. A concerned parent has a lot of power and can use it to make a difference in what children are eating on a local and national level.

Sustainability News: How did *Terra Madre*, the world meeting of food communities, contribute to the idea of land stewardship worldwide?

Mayo: The initial idea behind *Terra Madre* was to hold an event that recognizes the achievements of the small artisanal food producer and the cultural and agricultural traditions they keep alive on the same scale as, say, the World Economic Forum. Over the four-day *Terra Madre* conference, 5,000 people convened from a total of 131 countries to discuss the future of sustainable agriculture, their food traditions, means of production, and stories of land stewardship.

The United States delegation alone included 500 farmers, cheese makers, fishermen, brewers, chefs, and advocates from coast to coast. Each delegate was recognized as part of a unique community; a literal community such as the algae gatherers of Ethiopia, or a community of interest, such as the seed savers of Russia. Participants came away inspired to continue their traditions and land stewardship, having shared experiences, stories, and expertise with producers from nearly every continent.

Sustainability News: Can the Slow Food movement help people relate to our national parks?

Mayo: The missions of the two organizations are intrinsically linked—to preserve our cultural and natural resources for our generation and for generations to come. It is not enough to just say why you should care for our environment and keep cultural food traditions alive, it makes much more personal impact if you actually experience it firsthand. Organizations such as national parks can harness the energy and entrepreneurial spirit of this movement to further their own missions by collaborating with a local convivium on any number of events held throughout the year. And, if there isn't a convivium in your area, your local park supporters might consider starting one! ■

By Denali National Park and Preserve Staff



Top: Dense vegetation crowds dangerously close to residential cabins at Denali National Park and Preserve before a hazard fuels removal project began in fall of 2004.

Bottom: Work crews use a two-ton dump truck and a loader to remove piles of cut vegetation from the work site. Some logs were saved for historic preservation work in the park, visitor center displays, and to stock some backcountry cabins with firewood. Other materials were used in land reclamation projects by a nearby coal mining operation.

Successful Teamwork Reduces Hazard Fuels Risk

Approximately every 60 years, fires burn near Denali National Park headquarters. The date of the last fire in the area was 1924. By 2004 eighty years of vegetation growth around structures had placed park headquarters in a wildland/urban interface. Thick vegetation complicated the ability of firefighters to safely control wildland fires and protect structures. This contributed to an already difficult task where the remoteness of the facility required additional effort and resources to protect structures. All of these factors pointed to a significant need to remove hazardous fuels.

The Alaska National Park Service Western Area Fire Management Program, in cooperation with Ancor Incorporated, a private 8(a) small business and disabled veteran contractor from Anchorage, Alaska, removed approximately 24 acres of biomass around buildings in the park headquarters area. In preparation for a wildland fire event, Ancor created defensible space around park structures to reduce the risk of property damage and to improve safety for employees, visitors, and fire suppression crews. Local residents made up 65 percent of the employees hired by the contractor, and work was completed in less than six weeks during fall of 2004.

The Denali hazard fuels removal project sets a precedent as the largest project of its kind to have occurred in a high visitation frontcountry area in Alaska's national parklands. Due to forecasted large quantities of biomass and limited disposal venues, fire management staff arranged to recycle materials produced by the project. Denali used cut trees for a dendrochronology project for the Murie Science and Learning Center, as well as for historic cabin restoration and as firewood for backcountry cabins. Furthermore, fire management staff established an exemplary partnership in order to reduce biomass removal costs. Ancor transported cut vegetation to a staging area for use in a reclamation project at the Usibelli Coal Mine site in Healy, Alaska, 12 miles north of park headquarters.

"Ancor worked with the park to effectively reuse much of the material," says Denali Public Affairs Officer Kris Fister. "Instead of hauling the debris off to a landfill, which is a major local issue, Ancor transported it to the coal mine for use in rehabilitation projects." A family-owned operation, Usibelli has pioneered successful land

reclamation techniques that have revegetated more than 5,500 acres since 1971 by contouring mined land and seeding it with a mixture of plants indigenous to northern regions. Some firewood-size material was stacked separately by Ancor near the end of the project for NPS staff to haul to volunteer fire departments in three local towns. Local community members were then invited to collect the firewood.

The hazard fuels project was conceived in the mid-1990s as a written proposal. Previous superintendents supported the concept; however, present Denali Superintendent Paul Anderson overcame initial resistance and pushed the project forward. "The difference in opinion was mostly on the part of permanent and seasonal employees who live at park headquarters," explains Kris Fister. "Besides the anticipated general disturbance, some were concerned about a lack of privacy that would result once screening vegetation was removed."

Western Area Fire Management staff and the Regional Fire Communication and Education Specialist focused on two project priorities, effective operational and communication strategies. The fire management team utilized the Incident Command System throughout the project to provide employee and visitor safety, foster a team work ethic, provide effective communication channels, and encourage support from Denali employees. Fire Management wrote an Incident Action Plan and revised the division assignment list daily. Weekly updates, a two-part lecture series on fire risk and *Firewise* concepts, and an open-door policy, proved successful in developing understanding of the project. "The fire management staff provided a lot of information on the scope of the project and invited residents to be present while trees were marked around their dwellings. The fire folks also asked residents for information on trees used by birds or other wildlife for nesting and den sites," adds Fister.

Carl Waters, president and owner of Ancor, Incorporated says, "The strategies implemented during the hazard fuels project worked wonderfully." In the spirit of the National Fire Plan, the Denali hazard fuels project exemplifies a proactive, cost-effective, collaborative approach to reduce the wildland fire risk to communities. According to Waters, "This project would not have been such a success without the partnerships." ■

By Andrew Lewis, Natwani Coalition

Corn Nourishes Hopi Culture

Dry and dusty throughout most of the year, the homelands of the Hopi people in northern Arizona appear anything but fertile. Yet for centuries, Hopi farmers and gardeners have nurtured dry-farmed orchards and fields, and even cultivated irrigated gardens to produce crops as varied as beans, melons, squash—and the most sacred food of all—corn.

For the Hopi people, the cultivation of corn is a cornerstone of seasonal activities as well as daily nutrition. Planting, sowing, growth, and harvest determine the Hopi ceremonial year. Corn is planted below mesas in sandy washes and canyon bottoms that naturally collect scarce precipitation. Seeds are carefully placed in the soil in groups of five or six, representing the communal character of the Hopi. Kernels planted in April, before life-giving monsoon rains arrive to the mesas, produce corn that is important for *Niman*, the “Going Home Ceremony,” held in July.

Niman commemorates the return of spirit beings, or *Katsinam*, to their home in the San Francisco Peaks. Having bestowed their blessings on the Hopi people and their land, the masked *Katsinam* perform one last public dance, their arms filled with freshly harvested green corn stalks, signaling that corn will soon be abundant in the fields. Purifying corn meal is sprinkled by the father of the *Katsinam* as he delivers a farewell speech and creates a corn meal path for the *Katsinam* to follow on their westward journey to the spirit world.

For additional information on Hopi agriculture and restoring life to Hopi farming, contact Andrew Lewis, Natwani Coalition, P.O. Box 942, Polacca, AZ, 86402, 928-737-4646.



A First Mesa farmer works in a terrace garden using dry-land farming practices that have long sustained the Hopi.

A complex network of spring-fed stone terraces lies perched on an isolated cliff northeast of the ancient Hopi village of Walpi. Known as *Wepo*, the tumbling walls and overgrown fields are now largely abandoned, but they once produced an abundance of fresh fruits and vegetables—heirloom peaches, apricots, apples, grapes, corn, squash, melons—that sustained the mesa villages for hundreds of years.

The introduction of a wage economy in the 1960s, lifestyle changes, and easier access to the city have struck a heavy blow to traditional Hopi farming practices. Farming traditions are dying out, and few parents encourage their children to take a role in producing locally-grown, traditional, and healthy foods. Since the growing of food plays a central role in the ceremonial Hopi *Kachina* dances, the loss of agricultural activity threatens the very heart of the Hopi religion. In addition, lack of physical activity and reliance on junk foods and other non-traditional food habits has resulted in more than half of Hopi elementary school children being overweight or obese. Diabetes has become the tribe's most serious health problem, with more than half of Hopi adults (some 1,200 individuals) suffering from this nutrition-related disease.

Tribal leaders and farmers worry that the continuation of food and agricultural traditions is more tenuous than ever before. The highly specialized knowledge required to successfully dry farm in this arid landscape is not being passed on, and the physical activity required of Hopi youth as they farmed the land with their families has been replaced by modern sedentary pastimes. The strong Hopi identity as stewards of the land is slowly being lost among the younger generation.



Hopi children participate in a Head Start program at a local farmers' market where healthy, fresh foods are sold.

Natwani Tu'sawyaqam (“coalition dedicated to the rejuvenation of all life”) with the Hopi Tribe and village leaders, is reversing this trend. At the beginning of the 2004 school year, a pilot healthy foods initiative was launched at a Hopi elementary school. A representative of the Special Diabetes Program addressed the Parent Teacher Organization, encouraging adults to offer healthier foods at class and school events. During the year, the school experienced a dramatic turnaround in the foods being offered.

The Hopi Food and Agriculture Summit held in *Kykotsmovi* in June 2004 helped launch additional innovative programs. With participation of more than 300 tribal members, the community suggested initiatives such as creating a summer farming program for youth to work with traditional farmers and assist with terrace garden restoration; developing a culturally based classroom curriculum to teach children about traditional foods, farming, and gardening techniques; increasing the use of traditional Hopi crops by having school children grow seedlings and graft traditional fruit tree varieties; and promoting locally produced foods in school cafeterias.

A pilot greenhouse has since been built at the *Kykotsmovi* youth center, and clan members are returning to *Wepo* terraces. Youth work parties helped restore water flow and cleared terraces for planting. Seedlings from Hopi heirloom fruit tree cuttings will be planted to restore the ancient orchard. Nevertheless, the road will be long. What has been lost over the past 40 years will not be easily regained; yet, in time, the terraces and fields will be abundant again, and ancient practices that sustained a people for centuries will be rekindled in a new generation of Hopi farmers. ■

By Diane T. Liggett

Cuyahoga Valley's Countryside Initiative Breaks New Ground



PHOTO BY LINDY WERTMAN

Spring Hill Farm & Market, Ltd. grower Alan Halko sells sustainably produced flowers and vegetables at the Countryside Farmers' Market. Located at Heritage Farms, a privately owned family farm in Cuyahoga Valley National Park, the farmers' market is a one-of-a-kind operation for national parks in the United States.

For entrepreneurs at Spring Hill Farm & Market Ltd., Blue Hen Family Farm, and Sarah's Vineyard, Cuyahoga Valley National Park is not only a living landscape; it is a lived-in landscape. These growers, farmers, and vintners wake up each morning in a national park; they go to work each day in a national park; and they contribute to preserving the agricultural heritage of the Cuyahoga Valley with the highest standards of environmental stewardship.

A haven from suburban sprawl in the Cleveland/Akron metro area in Ohio, Cuyahoga Valley National Park has provided a rural getaway for city dwellers since its establishment in 1974. As agriculture disappeared from the Valley, the mosaic of crops, woodlands, fields, and farms also vanished, challenging the NPS mission to preserve and protect the park's rural countryside for public use and enjoyment.

In 1999 a new nonprofit organization, the Cuyahoga Valley Countryside Conservancy, was established to help develop and manage the Countryside Initiative, an innovative approach to preserve and revitalize farming in the national park. The Countryside Initiative allows farm

leases of up to 60 years at fair market value rent. Use of NPS lands for agriculture was previously limited to special use permits.

Countryside Initiative farmers are active land stewards who rely upon biological, cultural, and mechanical alternatives, coupled with grass-based, free-range livestock systems. Such methods concentrate on high quality specialty products for direct, local, and retail sale to customers who value products grown in a socially and ecologically responsible manner. Farmers sell their products from roadside stands, farmers' markets, and through customized orders. In the future, farmers plan to offer pick-your-own operations, community supported agriculture (where shares of seasonal production are sold in advance to local families), and sales to local outlets such as grocery stores and restaurants.

Three successful leases have already made the Countryside Initiative a model for other multi-use parks. Working to preserve the park's rural landscape, while practicing environmentally friendly farming, the program demonstrates a successful balance of NPS natural and cultural resource management objectives. ■

May 15-18

Windpower 2005 Conference and Exhibition

Leading wind industry professionals from around the world will meet in Denver, Colorado, to showcase their products and services. Go to www.awea.org/wp05.html for details.

May 31-June 3

Greening the Heartland 2005: Cost, Practice, and Policy

Representatives of the green building industry meet in Chicago, Illinois, to discuss topics from architecture and engineering to urban design. Go to www.greeningtheheartland.org for details.

June 13-15

2005 Business and Sustainability Conference

Participants at this New York event will examine the approaches of emerging corporate leaders to address the promise and challenge of sustainable development. Go to www.conference-board.org/sustainability.htm for information.

June 23-27, June 30-July 4

Smithsonian Folklife Festival

One theme of this year's annual event on the National Mall is "Food Culture USA," where visitors learn about sustainable agriculture, traditional crops, and the cuisine of diverse cultures. Visit www.folklife.si.edu/festival/2005 for further details.

June 28-29

West Coast Energy Management Congress

This San Diego, California, technology expo explores new technologies and alternative energy options for energy cost control and energy supply security. Visit www.aeecenter.org/shows/.

July 19-22

Watershed Management 2005

This Williamsburg, Virginia, conference examines how to manage watersheds for human and natural impacts, with attention to engineering, ecological, and economic challenges. Go to www.asce.org/conferences/watershedmanagement2005/.

August 6-12

ISES Solar World Congress 2005

Participants will focus on global water issues and the challenge of providing clean and convenient water to communities. For details on this Orlando, Florida, event, visit www.swc2005.org.

August 14-17

Energy 2005 - The Solutions Network

Saving energy and renewable energy are the highlights of this Long Beach, California, energy management workshop and trade show for everyone from procurement officials to policy makers. Go to www.energy2005.ee.doe.gov for details.

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Sustainability News and additional NPS information about green practices appears at www.nature.nps.gov/sustainabilitynews.

National Park Service

The National Park Service is a bureau within the Department of the Interior. We preserve unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. We also cooperate with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

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