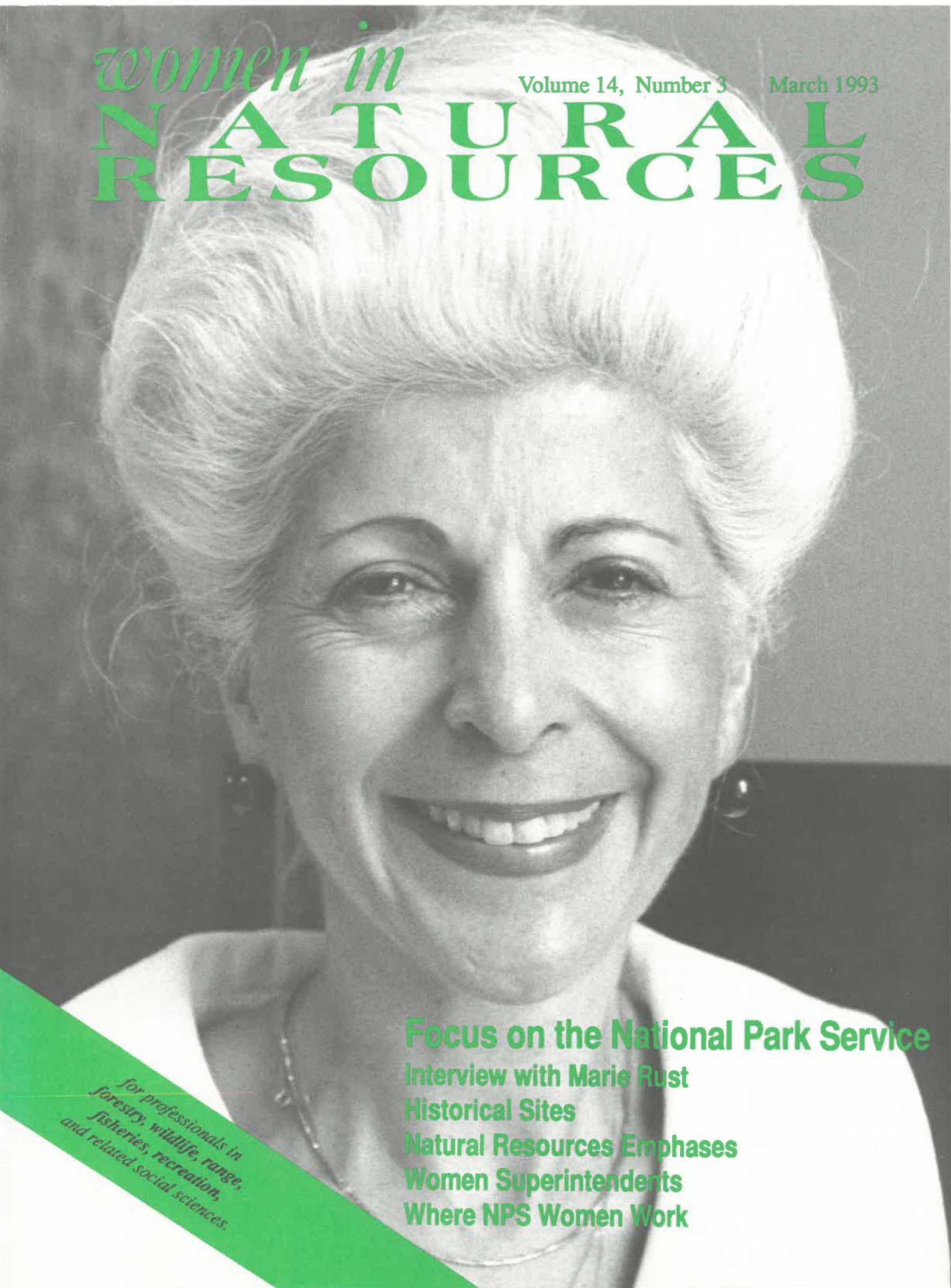


women in

Volume 14, Number 3

March 1993

NATURAL RESOURCES



Focus on the National Park Service
Interview with Marie Rust
Historical Sites
Natural Resources Emphases
Women Superintendents
Where NPS Women Work

*for professionals in
forestry, wildlife, range,
fisheries, recreation,
and related social sciences.*

Yosemite, I love you

Editorial

Karen E. Lyman

Love letters aren't exactly my strong suit. But every now and then something comes along that arouses my dormant romantic nature. While Yosemite National Park may not seem a likely object of anyone's desires, there's a lot to love.

Yosemite's most obvious attribute is, of course, its stupendous beauty. Secondly, you just have to appreciate how smoothly this park functions, particularly when you realize that it is probably under-funded, under-staffed, and over-used.

I don't live near the park, but I have relatives who do. And when I visit, they always suggest a day trip to Yosemite. I jump at the chance—not only to see the incomparable Yosemite once again, but to see it through their eyes, too. My aunt and uncle love that park, regarding it as an old and very dear friend. And like an old friend, they know it pretty well. They've mapped out all the best places to see. They can give you the abbreviated or full-length versions of Yosemite's history, tell you what's new, what programs are available and the scoop on park politics. They make it their business to keep up.

Each season in Yosemite has its particular charms according to my English professor uncle. Although all of my visits have occurred in the fall, he and my teacher aunt have purposefully taken trips there during winter, spring, and (naturally) summer—to experience Yosemite in all her seasonal glories. They plan trips—pilgrimages actually—as a treat for themselves in addition to squiring

out-of-towners like myself. When you go with them, you can't help but catch some of their enthusiasm. But loving Yosemite is more than something contagious.

It's partly magic, you see. Just one little visit to this scenic phenomenon and anyone can easily understand what motivated our forefathers to preserve it. Just squint your eyes and imagine seeing El Capitan or Half Dome for the first time. It probably was darn near a religious experience. It's one of our rich moments in history where men stepped back from personal gain to safeguard something for future generations simply because it was unique and worthwhile.

Our national parks are as American as apple pie, more a part of the American cultural experience than baseball or prom nights. These institutions are an important part of our heritage. The public's love affair with the parks bypasses all the politics, environmental degradation, budget cuts, and under-staffing. There are generations of us who have created powerful family memories by visiting together these national treasures. How many of our personal photo albums contain precious photographs of families posing together at a national park? It's the ultimate family adventure.

The beauty and awesome scenery of the Grand Canyon National Park not only inspired a movie recently (not the first, certainly) but served as paradigm for one person's moral view of the world. I don't doubt for a minute that many folks have had such personal revelations while gazing

at the spectacular scenery of Glacier, Yellowstone, Acadia, or one of dozens of others. You can't ignore the obvious example of nature's power in these places.

I know that many people worry about—and work to mitigate—the inch-by-inch destruction that too many visitors can cause in our national parks, Yosemite included. And they should worry. But let me tell you that from my point of view, and from the point of view of my dear relatives and other Friends and Lovers of Yosemite, the power of this park endures. Something truly wonderful is still happening. In spite of all the problems, our national parks continue to inspire and astonish millions of Americans every year.

Yosemite, I love you!

Karen E. Lyman

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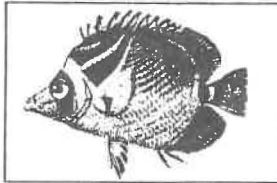
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You put out a good publication—interesting and diversified. I especially liked the editorial, the interview with Kathy Johnson, and the Lee Douthit piece on Alaska in the December issue. I also enjoyed the update on the programs at Colorado State University. A profile of all natural resources colleges might be a good idea.

Gene Bammel,
 Morgantown, West Virginia

The agroforestry article (wheat and trees) in your December issue should remind all of us that research which would lead to multiple use of crop lands—trees, fish farming, wildlife, domestic animals, crops, together or in rotation—should be a high priority everywhere, even here in this country. I would welcome more articles on this because it is part of the diversity of landuse which we all give lip-service to, but don't put our research money into.

Alexandra Shoberg,
 Portland, Oregon

I just saw the Soil Conservation Service focus issue (September 1992) and

I would like extra copies. How do I go about getting them?

J. Chris Notely, Washington DC

Eds. note: So glad you asked. In lots of 10 or more, the cost is \$4 each and you pay the postage. For fewer, it is \$6 each and we pay the postage and handling. Just send us your check and indicate what you want. These prices apply to all of our issues.

Kathy Johnson's interview ought to be in every natural resources agency office in the country, and on the required reading list of every professor who teaches policy.

Caren Docks, Akron, Ohio

Minnesota Department of Natural Resources
NATURAL RESOURCES SPECIALIST
Fish Management

Closes April 30, 1993

Announcing the creation of an eligibility list through competitive examination to fill an anticipated 10-15 vacancies in the next 12 months. Duties include: lake and stream surveys, preparation of lake and stream management plans, warmwater fish culture, environmental review, presentations to angling groups, habitat improvement, and special projects. Associate Fisheries Scientist Certification or the following coursework is required: four courses in fisheries and aquatic sciences, two of which must be directly related to fisheries; four additional courses in other biological sciences; and one course each in physics, chemistry, college algebra, and statistics. A transcript is required as part of the application. Salary range \$25,700 to \$33,600 annually, plus full state benefit package.

Request information and application forms from: Paul J. Wingate, DNR Fisheries, Box 12, 500 Lafayette Road, St. Paul, Minnesota 55155.

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OPINION: Defining "mentor"

I know that there are still not enough of us in high positions in every office or lab in the country, but we ought to be thinking more seriously about being mentors wherever we are. Some of us have had the benefit of help. Now that we have moved up the ladder, we know that it is not always easy or profitable to stick our necks out for those coming along behind—but we ought to do it. Traditionally, a mentor reaches out a helping hand to those they see (usually on rungs of the ladder below) who are worthy. These needy folks have talent and drive, the mentor can see it, and the needy are looking for the best, least troublesome ways to further their careers. The mentor actively responds *without being asked* to that situation, offering counsel and active career planning advice. This long-term, one-side-benefiting activity should not be confused with networking.

Dixie L. Ehrenreich, Editor

Cooperative Fish and Wildlife Research Units
US FISH & WILDLIFE SERVICE

The US Fish and Wildlife Service invites applications for Research Fishery Biologists (GS-482-11/12) to serve as the Assistant Unit Leader for Fisheries at the Iowa Cooperative Fish and Wildlife Research Unit. The successful candidate will be located at Iowa State University, in Ames, where the Unit is housed. The candidate will receive a courtesy faculty appointment. Assistant Unit Leader duties include establishing a strong research program, teaching at the graduate level, and technical assistance to resource managers on fisheries issues. Requirements of the position include a record of research productivity or resource management training and experience, an ability and commitment to teach, and an ability to administer research grants and program budgets. Candidates must meet the requirement for a faculty appointment (earned doctorate). To apply, send a completed Standard Form 171 and OPM Form 1170 (List of College courses to Ms. Dorothy Easley, Personnel Division, Research and Development, US Fish & Wildlife Service, mail stop ARL SQ 725, Washington DC 20240 (703-358-1771). Applications must reference the Iowa Assistant Unit Leader-Fisheries position, and must be postmarked no later than May 1, 1993. For application details, contact Dr. Ervin Klaas at the Iowa Cooperative Research Unit at 515-294-3159. The Service will pay up to \$10,000 for associated moving expenses as authorized by Federal Travel regulations.

USF&WS is an Equal Opportunity Employer. Applications are encouraged from women and minority candidates.

Opinion: Position sharing does work

Russell Galipeau, Chief, Resources Management, Wrangell-St. Elias National Park

In 1990, the largest National Park Service unit, Alaska's Wrangell-St. Elias National Park and Preserve (13.2 million acres) advertised to fill a Natural Resources Management Specialist position. *Bill Route*, an expert in fur-bearer biology, was hired, but shortly after accepting the position, he married *Karin Kozie*, who was working for the Fish and Wildlife Service in Michigan. They dove into the chronicles of the personnel management guidelines and learned in 1991 that they could share Bill's job.

There are obvious benefactors: Karin and Bill come to mind first, but the park benefits immeasurably by increasing the professional depth of expertise. Karin works with bald eagles, trumpeter swans, and breeding landbirds to develop inventory

and monitoring protocols. As a member of the national monitoring working group of the Partner-In-Flight program, Karin has contributed a chapter entitled "Monitoring Toxic Chemicals in Neotropical Migrants" to their 1992 publication *Needs Assessment: Monitoring Neotropical Birds*.

Karin has taken the lead in Alaska to develop off-road protocols for monitoring landbirds. Through the Alaska Neotropical Bird Working Group, she is helping to develop sampling techniques and protocol design.

All of this work has earned her national and international recognition. And brought credit to Wrangell-St. Elias which recognized the significant benefits and possibilities inherent in a job-share opportunity.

I especially like your focus issues. I have learned, in depth, about some agencies and disciplines that I never would have taken the time to research myself. Please do a focus issue on the professional natural resource woman as a person. By that I mean the woman who balances a career with a family and competing outside interests. There must be experts out there who can help me

head off the continuing crises I find myself in. I don't think it is just time management that is my problem—but maybe it is. Am I just greedy? I want to get ahead in my career without losing the kids, my church, my sanity, or my husband along the trail. Do us all a favor—write on the dark side of us as persons and find us some solid help.

Natalie Mildred, San Francisco

Dean for Research and Director FLORIDA AGRICULTURAL EXPERIMENT STATION

Closes May 14, 1993

The Dean for Research and Director of the Florida Agricultural Experiment Station administers statewide food, agricultural and natural resource research programs for the UF's Institute of Food and Agricultural Sciences (IFAS). Research activities are located in 20 departments in Gainesville, 13 Agricultural Research and Education Centers throughout the state, eight multidisciplinary centers, the School of Forest Resources and Conservation, and the College of Veterinary Medicine. The Dean provides programmatic leadership for research in food and agriculture, natural re-

sources, environmental quality, human nutrition, rural development and related areas, and is responsible for implementing the Affirmative Action Programs of the University of Florida and the Florida Agricultural Experiment Station. Applicants for this position should submit a resume of education, experience and publications, and the names and addresses of five references by May 14, 1993. Those wishing to nominate candidates should do so by contacting the Search Committee Chair by April 2, 1993. Send to: Dr. Robert J. Ferl, Chair, Search Committee for the Dean for Research, University of Florida, PO Box 110180, Gainesville FL 32611-0180. Women and minorities are especially encouraged to apply.

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FOREST ECOLOGIST

Closes April 15, 1993

The University of Georgia, Warnell School of Forest Resources, invites applications and nominations for a 12-month, tenure-track position beginning as early as July, 1993. The appointment will be made at the assistant professor level. Candidates are expected to conduct independent research and to teach appropriate graduate and undergraduate courses in forest ecology. Please submit a curriculum vitae, statements of research and teaching interests, reprints, and four letters of references to:

Dr. Bruce C. Bongarten

Warnell School of Forest Resources
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Responsibilities include preparing exhibits for the nature center, leading groups in field experiences, assisting with prairie management and restoration, assisting in the design and use of prairie plantings in the rough areas of a new golf course on site, and assisting in the development of a comprehensive site use program.

Education/Experience: BS minimum and a minimum of three years of experience in similar work.

The Byron Forest Preserve is committed to education, preservation, and recreation.

This is an exciting opportunity to build programs and develop potential. Weekend work will be necessary.

Salary Range \$22-26,000.

Send resume to Jack Philbrick, Director
Byron Forest Preserve
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Byron, Illinois 61010 (815-234-8535).

Do you need to advertise a
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THIS IS A FASCINATING CHRONOLOGICAL RECOUNTING OF THE HIRING AND PROGRESS OF WOMEN MANAGERS IN THE DEPARTMENT OF INTERIOR'S NATIONAL PARK SERVICE.

WOMEN SUPERINTENDENTS: A HISTORY

POLLY WELTS KAUFMAN

Introduction

Before the thrust for equal opportunity in the early 1970s, the Park Service promoted very few women to line positions with direct authority over personnel in parks, or in regional or central offices. Male administrators were much more comfortable with women as secretaries than as colleagues. Although the men depended on secretaries to keep their offices running when they were in the field and to accomplish a myriad of bureaucratic tasks, they did not easily share their power.

Early in the spring of 1971, Carol Martin, a young administrative officer at Custer Battlefield, received an unexpected call from Frank Kowski, director of the Park Service's Southwest Region. "I've been keeping an eye on you over the years," he said, and "you've been doing a good job. I have a vacancy at Tuzigoot for a superintendent. How would you like to be superintendent of a park?" Martin remembered being "flabbergasted."

Being a park superintendent had never occurred to her or to virtually any other woman in the Park Service at the time. Having a woman superintendent was outside nearly everyone's experience and expectations. Park superintendencies are the service's most coveted positions. There is an aura about the job: one woman administrator compared them to the Knights of the Round Table.

The first two park superintendents who had been Carol Martin's predecessors did not set a precedent for women who followed because they were selected outside traditional channels. In 1940, President Franklin D. Roosevelt appointed Gertrude Cooper superintendent of Vanderbilt Mansion National Historic Site. A decade later, Wilhelmina Harris took charge of the Adams

National Historic Site because of her previous experience with the Adams family homestead. The move in 1971 to promote women park superintendents from within the ranks of Park Service personnel was indeed a break with tradition.

Two Early Women Superintendents

The proportion of women administrators to men in the Park Service before Carol Martin's appointment is graphically illustrated in the series of photographs taken at superintendents' conferences. The 1965 photograph shows Superintendent Wilhelmina Harris, a lone woman marked by her white blouse, standing with 221 men. The 1941 photograph includes two women, standing with 66 men: Superintendent Gertrude Cooper and the service's first director of public relations, Isabelle Story.

Because of the unusual nature of the appointments of the first two women superintendents, Gertrude Cooper and Wilhelmina Harris, they were not only seen as different, but they were treated differently and operated with different rules from their male peers. In turn, the women either ignored or successfully opposed Park Service directives they disagreed with.

By executive order, for example, President Franklin D. Roosevelt appointed Gertrude Cooper superintendent of Vanderbilt Mansion in 1940. Roosevelt had several reasons for making the appointment. As neighbors of the Roosevelts in a summer colony on Canada's Campobello Island off Maine's easternmost point, the Cooper family was involved with one of Roosevelt's favorite projects: harnessing the power from the extreme tides of Passamaquoddy Bay. When the Canadian government withdrew its support, the Coopers lost their investment. By the time she was widowed in 1938, Gertrude Cooper needed a job. At the same

time, Roosevelt was anxious to preserve the Vanderbilt mansion because it was the property next to his estate in Hyde Park, New York, where both sit on bluffs high above the Hudson River. The niece of Frederick Vanderbilt, the last owner, offered the property to the federal government after Vanderbilt's death and Roosevelt pressured Harold Ickes, secretary of the interior, to accept it.

Gertrude Cooper believed that a woman should be in charge of the mansion because "the government wants it to appear as a house, not as a museum . . . to show how people of that time and wealth lived." She developed guided tours of the first and second floors of the house, refusing to put up barriers in the rooms, because she wanted visitors to feel like guests in a home. She worked with CCC men to repair the house, its facilities, and grounds. She had some major problems: lack of potable water in the house, a system that discharged raw sewage into the river, and the necessity to prepare housing on the third floor for 45 men hired to protect the president during World War II. Roosevelt took a great interest in the mansion and whenever Cooper had to make a decision, she communicated directly with the president himself. She resigned soon after his death in 1945.

Wilhelmina Harris, the only woman superintendent for the 21 years between 1950 and Carol Martin in 1971, was the superintendent with the longest period of service in one park in the Park Service when she retired in 1987 after 37 years. When the Adams Memorial Society decided to turn over the building in Quincy, Massachusetts—which was home to four generations of the Adams family, including two presidents—to the Park Service, Wilhelmina Harris was the logical person to take charge. For seven

summers before her marriage, she lived in the house as secretary to Brooks Adams and his wife, the last Adamsses to summer there.

The family suggested that Harris be hired to arrange the furnishings and objects and interpret the house. Recently widowed with three sons still in college, Harris became an historical aide in 1948 and superintendent two years later.

Like Gertrude Cooper, Harris believed a woman should be in charge of a historic house so visitors would feel as if they were coming into a family home and not a museum. Her major goal, she said, was "to fight the trends" in historical interpretation. Backed by members of the Adams family, she opposed a plan to turn the house into a period house and allowed it to reflect all four generations. She removed recorded talks designed to take the place of an interpreter and insisted that visitors be guided through the house. She resisted efforts to put in a superintendent over her and decided not to wear a uniform. Harris instituted a lecture series, published a guide to the house, and documented its furnishings in nine volumes.

The Park Service came to respect her as a woman with an independent mind. The Service allowed her to continue as superintendent until she was 91, although the day-to-day work was carried on by Marianne Peak, the woman who succeeded her. Harris was recognized for her work when the Department of Interior presented her in 1970 with its highest tribute, the Distinguished Service Award. Her "standard of excellence" the citation stated, was "unsurpassed by that of any historic house on exhibition in the National Park Service."

Women Superintendents from the ranks

Carol Martin's appointment in 1971 represented the cautious beginnings of a new policy to promote women to administrative positions. In many ways, she was a logical choice. Six years before, her husband Phillip drowned in a canoeing accident in Lake Powell at Glen Canyon National Recreation Area where he was a ranger, leaving her with two pre-school boys. Because she enjoyed the life-style of the service, including their assignments at the Grand Tetons and Carlsbad Caverns, she decided to bring up her boys in the parks. She began as a clerk-typist at the Tuzigoot pueblo ruins in the Verde Valley of central Arizona before transferring to Custer Battlefield where she was promoted to administrative officer.

As the widow of a ranger, Martin qualified as Park Service family; her honors in Spanish in college followed by a Fulbright scholarship in Austria proved her ability; and her five years in Park Service administration, including specific knowledge of Tuzigoot, provided her with the necessary training.

Like the other regional directors, Frank Kowski was under pressure from Park Service Director George Hartzog who was being urged by the secretaries of the interior under President Nixon to promote women and minorities to management positions. Hartzog set a goal of appointing five women to field management positions. At a special Equal Employment Opportunity [later EO] workshop in Washington in January 1971, he made his position clear. Kowski, who had been director of the Albright Training Center when the first women rangers entered in 1964, was quick to respond to the challenge. When the Western Region took over Tuzigoot later in the year because of regional boundary changes, he complained that they took away his woman superintendent. But he did not appoint another.

Other regions also followed Hartzog's directive. The Southeast Region chose historian Kathleen Dilonardo to take charge of Fort Caroline, a reconstructed fort in Jacksonville, Florida. An Albright graduate who had developed a successful interpretive program at Fort Pulaski, Dilonardo at 26 became the youngest superintendent in the service. After four years, Independence selected her as chief of interpretation. The Midwest Region advanced administrative clerk Elizabeth Disrude to superintendent at Perry's Victory, a memorial on an island in Lake Erie, after she had trained three superintendents who stayed for only brief terms. Lorraine Mintzmyer, who had risen from secretary to chief of programming and budgeting in the Midwest Region was named superintendent of the Herbert Hoover National Historic Site which not only preserved Hoover's home but his boyhood neighborhood. Outside the District of Columbia at Wolfrap Farm Park, a center for the performing arts, new superintendent Claire St. Jacques brought specific experience to the position.

The new Western regional director, Howard Chapman, developed a plan to train and promote women to superintendencies with Margaret Wilson, his chief of employee relations who was also Federal Woman's Program coordinator. The plan was to use the John Muir home in Martinez, California,

as a training ground for women superintendents. He selected Doris Omundson, who had been chief naturalist at Muir Woods, the only costal redwoods park preserved during Muir's lifetime. When she acquired experience, Chapman moved her to Cabrillo National Monument, where an 1880s lighthouse marks the tip of Point Loma in San Diego. Phyllis Shaw then succeeded Omundson at the John Muir site. Chapman also chose Mike Hackett, a long-time management assistant at Yosemite Valley, for a training position at Fort Point National Historic Site in San Francisco's Presidio. Three years later she was ready to assume a superintendency in Arizona combining the historic pueblo at Wupatki with nearby Sunset Crater, a volcanic cinder cone from the same era.

The current situation: pioneering park superintendencies

The ups and downs of the number of women appointed to superintendencies has depended almost entirely on the amount of support—or lack of it—from the top administration in the Park Service and the Department of the Interior. Between 1971 and 1980, the number of women superintendents gradually rose to 23, about nine percent of all superintendents, with a jump from about six percent around the time of the first Park Service Women's Conference in November 1979. In 1980, near the end of the administration of President Jimmy Carter, Director William Whalen named women to half of the new superintendencies, an all-time high. Whalen also named Lorraine Mintzmyer, by then superintendent of Buffalo National River, the first woman director of one of the Park Service's 10 regions. Starting in the Southwest Region, she transferred to the Rocky Mountain Region in 1980 where for more than 10 years she not only served as regional director but continued to be the only woman at that level. It was a particularly significant appointment because the region supervises many of the service's premier parks including Yellowstone, Glacier, Zion, and Canyonlands.

With the advent of the administration of Secretary of the Interior James Watt in 1981, the situation changed radically. Of the 30 new appointments to superintendencies in 1981, only two went to women. This pattern continued until early 1989. By then retirements had reduced the number of women superintendents to seven percent.

The downward trend ended with the change in administration in 1989. On March



1, at a public meeting where he cut the ribbon opening a traveling exhibit about women's history in the parks, Manuel Lujan, secretary of the interior, was questioned about the low number of women park superintendents. He responded positively to the challenge by saying: "Come back a year from now and see the changes that have been made." In order to keep his commitment before the public eye, the EO office decided to issue progress reports on a regular basis. By mid-1991, the number of women superintendents had nearly doubled; 14 percent of park managers were women. Five of the new women superintendents were African American women. At the end of 1992, the Rocky Mountain Region named the first Hispanic woman superintendent. Judith Cordova, was selected as manager of Colorado National Monument, noted for its sandstone canyons and wildlife.

One difference between women and men superintendents is their routes to the superintendency. Of all women who had been superintendents by the early 1990s, nearly half came from administrative or professional ranks, and only a little more than half from the park ranger job series, the traditional route for male superintendents. Part of the reason for this different pattern is that more women in administration had reached the higher grades necessary for promotion to park manager. Of the women who had been park rangers first, all but a few had attended the Albright Ranger Training course. Without these alternative routes, the Park Service would have been even slower to promote women and minorities to superintendencies.

Georgia Ellard (see above photo), the first African American woman superintendent, came from administration. She was the first person of color in the office of National Capital Parks when she started in the Park

Service as a GS3 clerk typist. After gaining experience at the Design Center and in personnel, the National Capital Region chose her to be the administrative officer at the new National Visitors' Center in Union Station prior to the Bicentennial. She was promoted to manager and trained many women who later became Park Service managers. After the roof of Union Station literally began to fall down, she had to close the Visitors' Center. The region selected her as assistant superintendent and then superintendent of Rock Creek Park, an urban park in the District of Columbia after she had more than 25 years in the Park Service. A pioneer for both women and African Americans in the Park Service, Ellard noted that she was told by many women, including her three daughters, that she was a role model for them.

When the service increased the number of women superintendents in 1989, the top administration may also have been worried about the possibility of a sex-discrimination suit. Since nearly 20 percent of the graduates of the Albright ranger training program between 1964 and 1984 were women with a similar retention rate as the men's, a reasonable goal for the number of women superintendents in the early 1990s could be 20 percent or about 50 positions. There will be another jump in numbers of women qualified to be superintendents by the mid-1990s; since 1985, 40 percent of the ranger trainees at Albright have been women.

These goals could also apply to regional directors, a position often selected from park superintendents, but still filled in early 1993 by nine men and one woman. Lorraine Mintzmyer retired in 1992 after Director James Ridenour transferred her from director of the Rocky Mountain Region to director of the Mid-Atlantic Region. Behind the

transfer was Mintzmyer's testimony before a congressional committee that Department of Interior officials shelved the Yellowstone Vision Plan, designed to protect the greater Yellowstone ecosystem, because of pressure from timber, ranching, and mining interests. Ridenour then selected Marie Rust as director of the North Atlantic Region, keeping one woman regional director.

Rust's career also demonstrates women's alternate routes to park manager and regional director positions. Rust came into the Park Service in 1974 from another federal agency as the first personnel officer in the newly organized North Atlantic Region. She later served as associate regional director for administration and deputy regional director and is a strong advocate for equal opportunity.

Where women superintendents serve

As regional directors began to appoint women park superintendents another pattern became clear. They selected women for small or medium-sized historic parks. Of all women who have been superintendents, three-quarters served in parks devoted to history; of those, one-third were military parks. Only four of the women in place as park superintendents early in 1993 were managers of large national parks devoted to natural areas. Two of them are in Alaska: Karen Wade at Wrangell-St. Elias NP and Anne Castellina at Kenai Fjords NP. Maureen Finnerty, manager of Olympic National Park in the Pacific Northwest, came to her post after serving as the first woman president of the Association of National Park Rangers, and Judith Cordova came to Colorado National Monument after serving as EO Manager.

Another difference between women and men superintendents is their ability to move from park to park as a way of earning higher grades. Once a woman becomes a park manager, she often finds it difficult to be selected for another park. Of the 67 women who had been superintendents early in 1993, only six moved three times and 14 moved twice. Although more than half of the women superintendents on duty in the mid-1990s have served less than three years, most of the early superintendents retired in their first positions, even though they applied for transfers to higher-graded superintendencies.

The proportion of women superintendents varies by region. Both because of the number of historic parks and the commitment of its regional directors, the North Atlantic region has been a leader in appoint-

ing women superintendents, reaching one-third in 1991. Surprisingly enough, one quarter of Alaska's parks, the largest in the country in acreage if not in staff, are run by women, again reflecting the commitment of its regional director.

Women on the job: differences right from the beginning

Women superintendents have brought an enormous amount of energy to their positions along with new points of view. They have brought an immediacy to local environmental issues on both a large and small scale. During the cleanup of the Exxon oil spill in Alaska's Prince William Sound in 1989, Ann Castellina, at Kenai Fjords chaired a multi-agency coordinating group including 10 local, state, and federal agencies who met daily to discuss the cleanup and advise Exxon by speaking with one voice. That group became permanent, ready to handle other emergencies. Park staff and residents felt such a sense of loss, Castellina said, that managing "the people resources" was as important as managing "the physical resources" during the spill.

In another example of a different point of view, at the Statue of Liberty nobody paid attention to the cost of cleaning up chewing gum until Ann Belkov became superintendent in 1991. She found that three maintenance employees did nothing else but remove chewing gum amounting to 600 pounds a year. Visitors immediately responded to the explanation of the problem and since that time leave their gum in specially marked trash cans as they step off the boat.

Women superintendents have been responsible for coordinating the production of park brochures, exhibits, and new walks and talks. One woman superintendent radically changed the interpretation of the story of Native Americans. Barbara Booher, of Cherokee and Ute descent, not only enlarged the American Indian story at Custer Battlefield, but was instrumental in changing the park's name to Little Bighorn Battlefield. The park brochure now emphasizes the "clash of cultures" and the pictures of Sioux leader Sitting Bull and Lt. Col. George Custer are equal in size.

Before such service organizations as the Kiwanis and Rotary Clubs allowed women to join their groups, women superintendents found other effective ways to develop community networks. JoAnn Kryal was the first woman superintendent at Fort Smith in Arkansas, famous as a frontier

federal court and fort. Since community support was essential before she could implement the general management plan for the park, Kryal made her contacts through such groups as the Chamber of Commerce, the United Way, public schools, and with regular appearances on live talk shows and on local television. Using her facility at cutting through paperwork learned as an administrative officer at Buffalo River, she set in motion and supervised the restoration of the fort's parade ground. She directed the removal of an old Coca-Cola bottling plant and the closing of two city streets. She developed a drainage system so grass could be restored in the cleared area, and installed a one-hundred-foot Douglas fir as the flagpole after an archeological survey determined its location. She also supervised the repointing of the brick and repair of the roof on the fort and spent some time rigged up on the roof to check on the contractors' work. She found funding for a curator and published a new park brochure. In addition to handling the crew and actors who filmed part of the TV mini-series, "The Blue and the Grey," at Fort Smith, she was the first woman on the annual rodeo committee, and joined members to lead the Grand Entry into the arena after only one riding lesson.

From the beginning, women superintendents were different from men superintendents who were not only expected to be married but to bring the unpaid services of their wives to the post. The price of becoming a woman superintendent in the Park Service is the acceptance of an androgynous model. The group of women superintendents who began their positions in the early 1970s followed a pattern that was continued by future women. The majority were either single or the person on whom the family depended for its financial support. Of all the women who have been park superintendents, two-thirds have been single, including women who were divorced or widowed. Nearly a third of those have also been single parents.

A twist on the pre-70s perception that if a woman wanted to be a park ranger, she had to marry one can be found in superintendencies. Two current women superintendents, who received their first training in the role of volunteer wives, eventually became superintendents themselves when they developed independent careers after being divorced from Park Service managers.

Looking to the future

At the end of the Bush administration, the number of women superintendents had dropped to 32 or 12 percent of all park managers. In early 1993, a new administration in Washington more dedicated to the advancement of women raised expectations that Park Service women would soon achieve a more equitable share of leadership positions.

Polly Welts Kaufman has been working on a book on the history of women and national parks over a hundred year period for the past eight years. It is scheduled for publication in the spring of 1994. Kaufman, who recently moved to Maine, teaches women's history at the University of Massachusetts, Boston. She is the author of Women Teachers on the Frontier (1984) and editor of The Search for Equity: Women at Brown University, 1891-1991 (1991).

WE'RE DEFINITELY NOT IN KANSAS ANYMORE—OR—YOU SHOULD ALWAYS START OUT FOR THE HOSPITAL BEFORE YOU START INTO LABOR.

PARK SERVICE LIFE

LOIS DALLE MOLLE

Warm quilts, quiet Sunday. My clock says 9:30 am. The radio says the temperature is -47° and the Inupiaq word of the day is *qayyuqtak* (bumpy piles of snow left after a west wind storm). Outside, the street lights reflecting on ice fog make eerie orange nebulae in the darkness. It's too dark to see the endless sea ice which stretches from my front yard to Russia. In another four hours the sun will just rise above the horizon and roll along it between white ice and white sky. Three hours and a thousand miles of ice later the sun will slip below the horizon and it will be dark again.

My sons and I put on our caribou mukluks, parkas, facemasks, beaver hats and mittens, and walk over snow so cold it crunches hollowly under foot. Fifteen minutes later, we might easily be in Seattle or San Diego. We are seated in a large, lovely dining room; green carpets, jade inlays, high backed upholstered booths, and we've just ordered Sunday brunch: strawberry waffles, eggs Benedict, juice, and fresh coffee. I work for the Northwest Alaska Areas of the National Park Service.

We live above the Arctic Circle on the edge of the Chuckchi Sea. I am finding here, as I have throughout my "Park Service life" that living in remote areas is a composite of unusual challenges, weary inconveniences, mellow benefits, and unexpected rewards.

People who work for the National park Service sometimes spend most of their career years living within actual Park boundaries (instead of Regional Offices in cities like Denver or Boston, or more urban monuments, historical sites, or battlefields.) Since parks, by definition, are areas of great natural wonder, Park service employees often live in some of the most breathtaking, magnificent, beautiful landscapes in the United States. We get to live in places the rest of the

world can only visit as tourists. I believe most of us lucky enough to live in National Parks thoroughly appreciate this special privilege. After all, it's part of a very romantic image: park ranger, remote cabin, pristine surroundings, glorious vistas, solitude.

The corollary, however, is that living in National Parks can also mean living in some of the remotest lands and harshest climates in the country. Because they are examples of unique natural features, National Parks are often places of extremes. Climates may exhibit extreme cold (interior and Arctic Alaska), extreme heat (Death Valley), or extreme wet (rain forests). They often have limited access: a desert, a sand dune, an island, a mountain, a canyon. These Parks, therefore, are often located in sparsely populated areas: "sparsely" populated because normal people don't WANT to live there! And yet, here we are, happily choosing to live absurdly far from conveniences. Assuming we're not all demented, (which is often not apparent to visitors who endlessly ask, "But what do you DO?"), why DO we choose this lifestyle?

There are certainly both advantages and disadvantages when it comes to living in isolated areas. The obvious problems which come with remote places: high prices, lack of access to basic services, few educational or entertainment options, and dressing children for a walk to school at -70°. These may be outweighed by some surprising bonuses to family life: easy access to wonderful country, surrounding awareness of natural cycles, and all the other benefits of life in the "slow lane."

The tradeoffs however, between these advantages and disadvantages shift over time. The initial romanticism of living in a National Park may be gradually replaced by reality. While keeping our original appreciation of "place," we gain, sometimes painfully, an adjoining ap-

preciation of the real difficulties posed by living in that romantic remote cabin, without neighbors, public transportation, or a washing machine. As we mature and acquire families with the accepted realities that brings, we are faced with reevaluating the lifestyle we have chosen.

For some of us the great pleasure of remote living is gradually outweighed by the realities of things like 250-mile-trips to pediatricians, getting children to school 20 miles away at -50° for "The most important basketball game of the year, Mom," and the logistics of ordering and storing enough powdered milk, peas, toilet paper, and cat litter for one whole year. Priorities shift, stresses mount, and moves to towns and regional offices offer good solutions.

Some of us find living in remote areas, however, remains a continual source of pleasure not outweighed by the difficulties. The perils of a porcupine, a bear or a moose in the backyard, or the drudgery of hauling water, thawing drains, chopping wood, and country music instead of public radio, still don't compare with the benefits of living where you hear only the wind.

I consider myself one of the very lucky Park Service women. For the past 19 years I have lived in National Parks. I have found such absolutely, unexpected rewards in legendarily difficult locations that I have been able to remain in far places happily, even enthusiastically. With each transfer I have migrated to the northwest at least 500 miles. This is unremarkable except for the fact that I was in the most northwest continental state to begin with.

From 6,400 feet on Mount Rainier, my husband and I moved to Alaska where winters were 40° colder, three months longer, and the distances to ANYTHING seemed multiplied by five. At Denali National Park, we first lived in a Park Service apartment, 150 miles

from town but with central heating, which I'm afraid we didn't fully appreciate at the time. As we accumulated children, sled dogs, and "stuff," we built our own home—warm, lovely and above all OURS—but without running water, or electricity, and still 150 miles from town. I still felt my job and our living situation compensated for the inconveniences.

There was the 150 mile trip to the hospital. In labor. In a Volkswagen. With my husband trying to explain calmly to the flagman that "No," we really didn't think we could wait 45 minutes for the pilot car to come back and show us the route through the road construction.

There was the day it took five hours to switch on the vacuum cleaner. You know how it goes: Vacuum cleaners need electricity. To make electricity you need to run the generator. It is too cold to start the big generator. To warm up the big generator you need to start the little generator. After the little generator has run long enough to warm up the big generator you are out of gas. To get the gas you need the tank key, which is in the pocket of your husband, who is out with the dogs hauling wood for the stove... You know...

There was the Halloween that the plastic portions of the costumes froze, cracked and fell off when the kids got out of the car at the first of our three possible Trick-or-Treat stops. And then there was the fine summer day I sprayed the "super-killer" bug repellent spray on the walls and seat of the outhouse. I knew that stuff dissolved sunglasses! Unfortunately, what I didn't understand, until my bare bottom sat down on it, was that the super-killer bug spray also dissolved the outhouse seat. Well, not really dissolved... more like turned it to contact cement...

We all have stories. It's become very clear to me that "Sense of Humor" should be a required KSA (Knowledge, Skills and Abilities) on the Park Service job application for persons living in remote parks.

Still, the rewards for a family living in a remote location are great. By sheer lack of other things to do, families spend a great deal of time together. Lack of electricity limits television and Nintendo time. Reading, games, family projects are pleasures. An awareness of the natu-

ral rhythms of your surroundings is unconscious and integral.

There eventually came a time for us though, when we could no longer do it. Like many other families, we found the three hour trip to any basic services just too long. We needed to be closer to medical care. We transferred to a town in Washington.

I worked for the school district in a challenging, creative position. I also found myself commuting; leaving home before my children went to school, returning after they did, never with the time or energy to visit, play, or just listen. I felt successful to get laundry done! This may be familiar to a great many American families, but it was certainly new to me. I found it overwhelming. My greatest admiration goes to women who make it work.

I reevaluated and started applying for jobs in the Park Service again, and here I am, back in an Alaskan park in one of those inconvenient places. Superficially, it may not seem a logical move. I am a single parent, I am a recent widow. I am away from any real support system I might have. I moved to an area where I knew only one family within 500 miles. I find that I am a member of a 10 percent white minority in a 90 percent Inupiaq Eskimo society. I live NORTH (for heavens sake!) of the Arctic Circle. Remember? That's where the sun doesn't even rise in December! I'm much closer to Russia than I am to any other part of the United States. I live on a treeless, windswept peninsula bordering the Arctic Ocean. Sea ice covers the water in front of my home from October to June (count it... three months of open water). There is no access by roads, railroads. Plane fare to Anchorage (the nearest gynecologist, theater or MacDonald's) is \$580.

My mother says, "You've gone about as far as you can go!" Well, that's true, but, incredibly enough, I'm happy and find life infinitely easier. I've discovered, as many of us have found over the years in odd places, that there are unexpected rewards to be reaped in unlikely places. I not only don't commute, I don't even

have a car. I don't need one! Kotzebue is one mile in length. Anything we need (in fact ALL that's available anyway) is within that one mile. The grocery store is five blocks away, the post office seven, school eight, and airport, two blocks. At -47°, I just put on my mukluks and walk. No cars to get started or keep repaired—it's heaven.

My office is next door to my home. My travel time to work is about 90 SECONDS a day. I have no child care necessities. My children leave home at 7:55 for school, I leave at 7:59 for work. They check in when they come home, and then they're right next door. Summer was equally easy. My boss accommodated a 6:00am—2:30pm schedule. The kids got up at 11:00am, we had lunch/ (their breakfast) together, and I ended my work day two hours later.

School quality is always a concern for parents where there is only one school. But what we may lack in variety may be compensated for by lessons which are not part of the curriculum. I know my sons will grow up with a better understanding of cultural differences and human similarities. Hopefully they will have a perspective on words like "self esteem" or "discrimination," that few white kids get.

Yes, I pay \$5.69 for a gallon of milk, \$2.89 for a loaf of bread. But I don't worry about getting stuck in traffic or what to do with my children after school.



Within five minutes we can be berry picking, ice skating, or heading on a snowmachine picnic. It wouldn't suit everyone, maybe not even us forever, but right now I'm unexpectedly delighted to be here.

Lois Dalle-Molle is Subsistence Manager for Kobuk Valley National Park, Cape Krusenstern National Monument, and Noatak National Preserve. She worked in Denali National Park (1978) and also wrote and taught audio conference courses for the University of Alaska Distance Delivery Program. Her MS in Forest Resources, her MA in economics, and her Ph.D. in Natural Resource Economics, are from University of Washington.

FOSSIL PREPARATION REQUIRES ADEPT HAND-EYE COORDINATION, DOCUMENTATION SKILLS, A KNOWLEDGE OF ANIMAL AND PLANT STRUCTURES, AND A RESPECT FOR THE INFORMATION HELD WITHIN.

JOHN DAY'S CLUES

CAMILLE EVANS

I bend over the microscope all afternoon scraping rock, grain by grain, from a tiny jaw, and finally—the lingual side of a tooth is emerging, a shadow under the last thin layer of matrix, a glint of dark enamel. Soon it will be possible to identify this little critter, to stitch its moment of life and death into the rich tapestry of the ancient past exposed at John Day Fossil Beds National Monument. It really doesn't get much better than that.

John Day Fossil Beds National Monument, with 45 million years of geologic time represented, was established in 1975 to preserve and protect the paleontological resources found within its 14,000 acres in eastern Oregon. From the Clarno Formation with strange, large brontotheres slogging through steamy subtropical jungles, to the Rattlesnake Formation and *Pliohippus* racing across grasslands, much of the story of mammal evolution is recorded.

The minerals replacing bone, teeth, plant stems, and forming the rock that surrounds the small percentage of organic material to have been buried quickly enough to avoid destruction, are mostly volcanic in origin. Mudflows, layer upon layer of claystones of ash mixed with soils, sandstone and consolidated gravels eroded from earlier mountains, have provided protection to these fossils for many millions of years. And now, these layers are slowly crumbling at the edges, the result of erosion by water and wind. The preserved remains of inhabitants of environments long gone have again become a visible part of our world.

In 1986, NPS paleontologist Ted Fremd initiated a systematic research program at the monument that continues as a model of excellence for a well-documented collection. Exacting field notes, air photos, and computer technology make it possible to pin-point where each fossil came from, and its relationship to others. For without knowing the precise stratigraphic location, a fossil becomes a bit of evidence lost in time—interesting, often beautiful, but lacking scientific value.

Following a cyclic prospecting plan that is based on rates of erosion and collecting history, we carefully cover designated areas—often on hands and knees—searching for a shape, texture, or a color, that indicates a fossil. An isolated chip of bone with no identifying characteristics, and not part of a “bone trail” leading up to a source fossil, is not collected. A single tooth, which may be all that is necessary to identify the animal, is collected. And then there are those times when the tip of a tooth leads back into the rock cliff to a complete skull, and much of the skeleton. A major excavation can take months of hard work with chisel, hammer, pick, saw, and culminate in a plaster and burlap jacket securely wrapped around the specimen and surrounding matrix. The largest block we have collected here at JODA

weighed about 350 lbs. To bring it safely to the lab required the strength and finesse of nine employees and volunteers using ropes and pulleys, and a litter designed for carrying injured hikers.

Within our small, but well-equipped fossil preparation laboratory, I use hand tools and sophisticated power equipment to uncover fragile bones. Although they have survived all the processes of burial and fossilization, and are harder than the rock around them, most of the specimens I work on are brittle as glass. A slip of the tiny pneumatic “jack-hammer” stylus can shatter the bone surface. A fine stream of abrasive from the miniature sand-blaster will etch into a tooth. “To do no harm” to a fossil remains a preparator’s creed—and sometimes this means stopping short of total exposure.

I use plastic consolidants and glues to strengthen and reconnect bones. Materials developed for other uses have been assimilated into fossil preparation work: “Friendly Plastic,” CarboWax, latex, RTV silicones, and epoxy resins for fossil replication. Each fossil area within the National Park Service is different. Each fossil is unique—demanding individualized treatment. It follows that a complete record of what is done to each fossil is critical—which tools, which consolidants were used, how long it took.

The level of preparation is determined by the ultimate goal for that fossil. While some fossils are destined for exhibit in our limited museum space, most of the work I do results in an addition to the cataloged museum study collection at the monument. This collection is in constant use by our paleontologist, Ted Fremd, as he studies the dynamics of environmental change and evolutionary adaptation. Many other researchers travel here to study, compare, and add their particular knowledge to further understanding the paleontological resource of John Day Fossil Beds. Uncovering a bone end, or cusp on a tooth that reaffirms a theory or begs a question is my contribution, my job.

Preparators are, by necessity, adaptive. There is no formal education for entry into the field. Most of us have learned basic techniques from a mentor, have taken courses in geology, paleontology, and comparative anatomy, and have skills in art. We draw on vast reservoirs of patience.

Camille Evans has been a Museum Technician (Fossil Preparator) at John Day Fossil Beds National Monument since 1990. She has a Bachelor's from the University of Minnesota. In addition to this work, she is a sculptor and illustrator, and learned preparation techniques and museum procedures as a long time volunteer at the Burke Museum, University of Washington. There are only two other NPS permanent preparators: Ann Elder and Scott Madsen, both at Dinosaur National Monument.

USING THE POWER AND THE SWITCH, INTERPRETERS IN PARK SETTINGS CONVEY THEIR LOVE AND KNOWLEDGE ABOUT THE RESOURCES TO THE POLITICAL PUBLIC WHO PROVIDES SUPPORT AND PROTECTION FOR THOSE RESOURCES.

THE CHANNEL ISLANDS STORY

CAROL J. SPEARS

"Wow! This is better than Jacques Cousteau!"

Spiky purple urchins, bright orange garibaldi fish, and gray-speckled octopus dart across the screens of the three television monitors mounted in a wooden building on the dock of Anacapa Island. Cold, salty sea spray from the rolling Pacific surf lightly mists the visitors to Channel Islands National Park in California as they crowd around the monitors.

A National Park Service interpreter is diving with an underwater video camera and a special SCUBA mask that allows her to speak into a microphone and to be heard by the visitors on the dock. Her labored breathing makes her sound like Darth Vader from *Star Wars* as she struggles against the underwater surge to keep the camera focused on the intricate marine life. An interpreter at the television monitors explains to visitors what they are seeing in this "Underwater Hike Through a Kelp Forest" program. The quote at the opening of this section came from a young boy who was watching the program, and reflects the uniqueness of seeing a *live* underwater video program, not one that has been pre-recorded with narration dubbed over.

Through the magic of innovative interpretation, and a great deal of hard work, the wonders of the diversity of marine critters that inhabit the underwater forest of giant kelp are revealed to visitors of all ages who come from across the country. Half of the 250,000-acre park lies under the sea. Most of the visitors to Channel Islands National Park do not dive, and would never see, face-to-face, some of the over 1,000 organisms that thrive in the kelp forest if there were no underwater video programs. For that reason, the park's marine plants and animals could truly become a neglected resource, for how can we humans care about something that we do not even know exists? That is why interpretation is vital at all of our parks and protected areas.

Interpretation is one of the most challenging professions in the overall discipline

of preserving our world's natural and cultural resources. Those of us who work in the field of natural resources at times may suffer from a type of tunnel vision that sees the world of environmental protection as an "us" against "them." The "us" is composed of all the scientists, resources managers, site managers, and educators who make a living from protecting resources. The "them" is composed of the public who uses, enjoys, abuses, loves, cares for, and pays for the protected areas.

The "us" and "them" attitude can cause us to sometimes lose sight of the fact that all the research in the world does not preserve our precious biological diversity; park managers do not preserve our country's natural areas; interpretive hikes do not preserve the functioning ecosystems that provide critical survival benefits to our human culture. People preserve our parks, forests, and natural areas. People comprise the political public that



creates and supports our preserved areas. But along with that power of the public to create, comes the power to disassemble the parks, something that park managers must be aware of as they plan long-term preservation and conservation strategies.

So how and why do the public support our parks? People preserve things that they love and value. That love and value come from personal knowledge and experience. Personal knowledge may be about an abstract concept, such as an intact, thriving marine ecosystem, or knowledge of a very specific event, such as an individual gray whale trapped in the invisible lines of gill nets that litter our oceans. We would be hard pressed to come up with a list of threats to the resources that did not involve humans and our human culture. If there is to be real, long-term preservation of these resources, we must include the public in on our efforts. The end goal of all interpretation must be to encourage our visitors to acknowledge what they value, honestly question how their every-day behavior may threaten the resources that they value, and take action to accomplish changes they should make in their behavior to continue the preservation of the resources they value.

At the same time, we interpreters must communicate in a way that is fun and that visitors truly enjoy. To be successful, interpreters must intimately know their site's resources, be knowledgeable about the most up-to-date research and scientific theories associated with the resources, be expert communicators in the written and spoken word and in intuitive communication, and know the intricacies of social science.

"You must really love the ocean life. I can see it on your face."

At Channel Islands, we face the added challenge of interpreting a resource that is never seen by most of our visitors. The five islands in the park are part of a chain of eight lying offshore of the most heavily-populated part of our country, southern California. For half of the year the fog and marine layer of



clouds obscure the islands from sight from the mainland. Even if the islands are seen by the millions of people on the coast, most of them do not know that the islands are part of a national park, and that they can actually visit them. The distance from shore, from 11 to 45 miles of open Pacific Ocean, is a natural barrier. There are many people who will not set sail in a boat or venture onto a small plane due to lack of money, sea-sickness, or fear of the sea or flying. This is definitely not the average drive-to national park. And for those who do make it to the islands, many will not experience the underwater world because they do not snorkel or dive.

An average of 180,000 visitors each year come to the visitor center on the mainland. Contrast that number to the 60,000 people who go to the park's waters or islands. Park interpreters' difficult task, clearly, is to bring to life the remote, unseen resources of Channel Islands to the thousands of visitors who will not see the islands or the sea around them for themselves. The remark "You must really love the ocean" did not come from a visitor to the off-shore islands. It came from a woman from the mid-west after attending a tide pool talk at the mainland visitor center, where she saw for the first time in her life some of the strange marine creatures that share the earth with us.

Even here on the mainland, interpreters can show their love of the resource, through a state-of-the-art reproduction of a living tide pool. The tide pool is complete with a wave machine, plastic mussels that look good enough to eat, and viewing windows that go down to the floor so children of all ages can get an underwater, close-up view of the goings-on in a tide pool.

The exhibit took a year to plan and construct, and is the most effective mechanism we have to interpret the marine resources to mainland visitors. Twenty-thousand-plus school children squealed and giggled during their visits throughout the year as they got their first touch of critters such as a sea cucumber, an animal that looks like a cucumber and will eviscerate its innards as an escape maneuver if provoked enough by a predator. Or they gingerly supported in their hands the alien-looking purple sea urchin and learned about its complex relationship with kelp, sea otters, and humans.

In addition to tide pool talks at the mainland visitor center, interpreters present scheduled weekend programs about a variety of the park's natural and cultural resources, two-hour long interactive school programs throughout the week, and roving interpretive talks at other exhibits.

Visitors who make it to the park waters and islands learn about the park through interpreters on the concession-operated boats and/or interpretive hikes on the islands. Some of the hikes include a 16-mile round trip trek across wild, windy San Miguel Island for a once-in-a-life time view of over 20,000 elephant seals. The seals are breeding, fighting, pupping, and just hanging out on Point Bennett, a lonely spit of white sand that stretches into the gray ocean and points to the next piece of land far to the west—the Hawaiian Islands. San Miguel is the only place in the world where five species of pinnipeds breed and pup.

Visitors to Santa Rosa Island can fly for 30 minutes or take a three-hour boat ride one way and be met by an interpreter who drives them in a four-wheel drive carry-all to the eastern-most point. Because of limited time on the 53,000 acre island and limited access, the vehicle tour is the best way to allow visitors to get a glimpse of the resource. They can hike through ancient Torrey pines, that are found at only one other place on the planet, investigate Indian middens, relax at the ocean's edge on white sand beaches, or explore tide pools. A segment of the interpretive hikes includes a rendition of what it is like to grow up on Santa Rosa on an island cattle ranch that still uses Mexican vaqueros (cowboys) on horseback, given by the 16-year old daughter of the ranch foreman, who volunteers with us for the programs.

Channel Islands may have one of the best ratios of visitors to interpreters in the National Park Service. All visitors are greeted as they step onto the islands. On San Miguel and Santa Rosa, visitors must be accompanied by a ranger. And throughout the year, several concession trips have interpreters on them who are with their group for two days and nights, in the confines of a boat or on the island trails. For these trips, interpreters embark with passengers at 1:00 a.m., sleep on the boat, lead the hikes on San Miguel and Santa Rosa Islands, and interpret the marine life that is encountered on the journey.

"Knowledge is power, but enthusiasm is the switch."

These programs are dynamic, with interpreters changing them from year to year to improve the telling of the stories of the park. But interpretation in the national parks is not serendipitous. A successful interpretive program is the result of a great deal of long-term and short-term planning, research, and practice. Channel Islands is a relatively new park, established in 1980. Interpretive planning at the still-developing Channel Islands dictates innovation, experimentation, close cooperation with other divisions and non-park entities, and long-term thinking. Interpretive themes are identified in the enabling legislation that established the park, the park's General Management Plan, and Annual Statement For Interpretation. Each interpreter must use these documents and the counseling of supervisors to select a program topic, write the theme, goals, objectives, targeted audience, methods, and outline of the program.

Then the interpreters must call on their creativity to supply what I call the magic of interpretation. This magic is found in the introductory hook, just the right alignment of words, the clever prop, the effective interactive method, the unusual sensory technique, that will touch the visitors' hearts and make them remember the theme of the program. This added touch, this magic, is inspired from the love within the interpreter for the resources and love for the people who use the resource. This love was called the priceless ingredient by the founder of the philosophy of interpretation, Freeman Tilden, in his book, *Interpreting Our Heritage*, published in 1957.

I recently reread the old quote (found at the top of this section) about knowledge is power. You could think of the knowledge, "the power," as all the information about the resources and the theories of interpretation. The enthusiasm, "the switch," are the personal qualities of the interpreter. You must have both knowledge and enthusiasm, the power and the switch, to turn on the public to preserving our natural resources.

Carol J. Spears has worked for the National Park Service as an interpreter since 1980. In 1987 she received the National Park Service's Freeman Tilden award for excellence in interpretation. She has a M. S. in zoology from Oklahoma State University and has worked three years on a Ph. D. in wildlife ecology at Oregon State University. Spears is currently Chief of Interpretation at Channel Islands National Park in southern California.

Jessie A. Micales

Research

In

Progress

Focus on:
tropical forestry

expansion of Forest Service research in the tropics coincided with an initiative by the New York Botanical Garden to coordinate the publication of a basidiomycete flora of the Greater Antilles that will formally describe all of the basidiomycete fungi found in this region. What a daunting task! There are only a small number of mycologists who specialize in tropical fungi, and we are spread very thinly around the globe. The number of basidiomycete species alone in the Greater Antilles has been roughly estimated at 2,000 to 2,500. This project will involve much collaboration with mycologists outside the Forest Service and will require the training of new tropical mycologists.

The Greater Antilles are a chain of islands separating the Atlantic Ocean from the Caribbean Sea. They extend from Cuba and Jamaica in the West to Puerto Rico and the Virgin Islands in the East. Although most of the Antillean Islands fall within tropical latitudes, there is a great diversity of forest types caused by differences in elevation, rain shadows, and soil types. Rain forests are found on the larger islands with high elevations, such as Jamaica, Puerto Rico, and Hispaniola. The Dominican Republic on the island of Hispaniola has the highest mountains in the Greater Antilles (close to 10,000 feet) and has native pine forests above the tropical rain forests. It is not unusual for water to freeze at night on the higher peaks during the winter months. Moist and dry forests dominate the lower islands and portions of the higher islands that fall in the rain shadows of the major mountain ranges.

Researchers at the International Institute of Tropical Forestry and collaborating scientists at the Caribbean National Forest in the Luquillo Mountains of Puerto Rico established the need for the publication of a comprehensive regional fungal flora. Fungi play many different roles in the tropical forest. They are crucial in recycling nutrients through the decomposition of wood and litter, thus making nutrients available for tree growth. Wood-decomposing fungi can actually compete with trees for limited soil nutrients. For this reason, the short-term effect of wood fall from Hurricane Hugo was to slow the rate of tree growth and recovery.

Basidiomycetes in the fine forest floor litter prevent soil erosion and accompanying nutrient losses from these tropical forest ecosystems, located on steep mountain slopes, by binding the thin litter layer into a mat. The wet forest and rain forest life zones typically receive 3,000 to 5,000 mm of rain per year, so the potential losses from erosion are very high. Furthermore, most trees are dependent to some

degree on mycorrhizal fungi for their nutrient uptake; in fact, some trees cannot grow without their fungal symbionts. Such relationships are especially important in highly weathered tropical soils or where water availability is seasonal.

There are also pathogens and fungi that cause heart rot. One of the undescribed species of heart rot fungi has a beneficial effect; it hollows out the favorite nest trees of the endangered Puerto Rican parrot.

Despite the importance of fungi in maintaining the productivity of tropical forests, our knowledge of the fungal flora of the Greater Antilles region is fragmentary. Of more than 300 species of macrofungi we've identified from Puerto Rico, only 27% were previously reported from the island. Among the mushrooms, approximately 50% of the species can be found in the Agaric Flora of the Lesser Antilles. A slightly higher percentage is described in the Fungal Flora of Venezuela. Depending upon the group of fungi, 10 - 30% of the macrofungi are undescribed and new to science. Such large gaps in our knowledge are partially due to incomplete coverage of this area in other fungal floras, but also result from speciation and the limited dispersal of new species among the islands and to the mainland.

Each island has many unique species. The Basidiomycete Flora of the Greater Antilles will improve our knowledge of the mechanisms that produce high biodiversity.

D. Jean Lodge received her B.S. (with Honor's thesis) in aquatic entomology from Kent State University in 1976. She has an M.S. in Plant Pathology with a minor in Entomology and a Ph.D. in Botany from North Carolina State University.

Biomass of Tropical Forests and the Global Carbon Cycle

Sandra Brown
University of Illinois

The increase in atmospheric concentrations of greenhouse gases and their potential to change the world's climate is a topic of great concern today. The most important of these gases is carbon dioxide. While most of the CO₂ emissions are produced from burning fossil fuels, changes in land-use in the tropics, particularly conversion of forests to agriculture, are also a source. The net flux from the tropics is not well known because of the large uncertainty in the rates of land-use change (including forest degradation, logging, conversion to permanent agriculture, conversion to slash and burn agriculture, and reforestation) and the difficulty in

**Basidiomycete Flora
of the Greater Antilles**
D. Jean Lodge
U.S. Forest Service, Puerto Rico

The U. S. Forest Service's Center for Forest Mycology Research (CFMR), located at the Forest Products Laboratory in Madison, WI, recently expanded its research into tropical forestry using funding from President Bush's Tropical Forest Initiative. This additional funding allowed CFMR to create a position for a tropical forest mycologist stationed in the Caribbean National Forest in Puerto Rico.

I had been working in Puerto Rico since 1983 on the ecological roles of fungi in nutrient cycling in wet tropical forest and accepted CFMR's position in 1992. This

estimating the amount of biomass, or carbon pools, in the forests undergoing these changes. Reducing the uncertainty in the estimates of carbon pools of tropical forests, with emphasis on estimating the vegetative biomass, is the focus of one of my research areas. This research is done in cooperation with colleagues at the U. S. Forest Service and Illinois Natural History Survey and is funded by the U. S. Department of Energy's Global Change Research Program.

For the past decade, I have been refining the estimates of biomass of tropical forests as new methods, data bases, and technologies have become available. By biomass, I mean the above ground biomass density (biomass per unit area) of the tree component, including leaves, twigs, branches, bole, and bark. The tree components account for the largest fraction of the total biomass, and my research has focused on improving the accuracy and precision of this quantity. Work is now underway on improving estimates of below ground biomass and coarse litter (e.g., wood debris) as well.

Of obvious relevance to the global carbon cycle is the need to know the biomass density of the forests undergoing conversion. This implies that we need to know the spatial distribution of forest biomass density. This can be done by producing biomass density maps. Today, remote sensing technology can be used to detect changes in land-use patterns, but it cannot be used to determine biomass density of complex tropical forests. This led us to use geographical information systems (GIS) technology to estimate and extrapolate forest biomass density

estimates across the whole tropics and to generate maps. To date, we have used GIS techniques to generate maps of biomass density and biomass density change for Peninsular Malaysia for two periods of time, and biomass density maps as of about 1980 for all of tropical Asia and tropical South America.

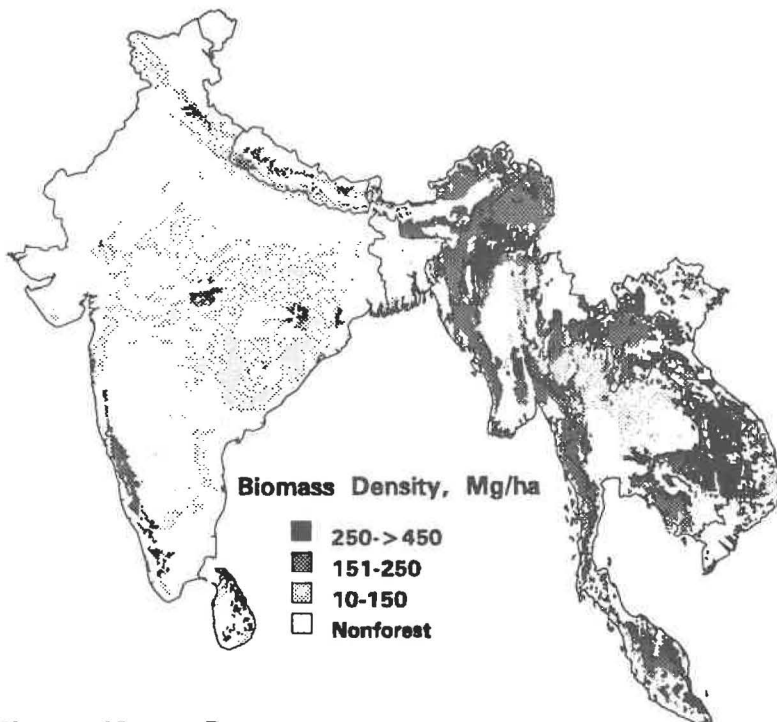
Maps of biomass and its change for Peninsular Malaysia were generated from data in two national forest inventories (1972 and 1982) using new methodology that we developed and from forest maps. Results from this work demonstrate that large areas of so called "undisturbed forests" lost biomass over the ten year period (generally caused by illicit log poaching), whereas others gained biomass. These changes in biomass density were correlated with forest fragmentation: the more fragmented, or the more edge per unit area, the greater the losses in biomass, whereas those forests that gained biomass became less fragmented or were remote.

Because suitable forest inventory data for tropical Asia and America are lacking, we used GIS technology and modeling to generate a series of biomass density maps. Our model assumed that the present distribution of forest biomass density is based on the potential amount of vegetation that the landscape can support under the prevailing climatic, edaphic, and topographic conditions as well as the cumulative impact of human activities, such as forest clearing, logging, fuelwood collection, and other degrading activities. We first modeled the potential biomass density of the regions by overlaying, in GIS, data layers or maps of precipitation,

climate, soil texture, slope, and elevation according to simple relationships, and calibrating the model output with actual biomass data. We then masked this potential biomass density map with a map of the forested areas as of about 1980 to account for deforestation up to this point in time. The final step was to add the influence of human activities that reduce biomass density to produce a map of actual forest biomass. Figure 1 shows an example of this product for tropical continental Asia, where biomass diversity classes have been regrouped into three classes from the original nine of the color map. For this step, we developed regression equations, stratified into three main climate zones, between degradation ratios and population density, both estimated at the subnational level of resolution. The degradation ratios were determined from actual biomass estimates based on forest inventories done in the regions to potential biomass based on our model.

One advantage of using the GIS approach to estimate biomass density of tropical forests is that it enables estimates to be made over the whole region where lack of suitable data precludes direct estimation. More importantly, GIS also provides a spatial representation useful for coupling with maps of land-use change and spatial terrestrial carbon models. I am also now using a similar approach to generate maps of soil organic carbon for the same region.

Sandra Brown is an Associate Professor in the Department of Forestry, University of Illinois. She obtained her B.S. in Chemistry from the University of Nottingham (U.K.), her M.S. in Engineering Science from the University of South Florida, and her Ph.D. in Systems Ecology from the University of Florida.



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THIS SUPERINTENDENT RELISHES HER ROLE. DISTINGUISHING THE HISTORY OF THE AMERICAN PEOPLE FROM THAT OF OUR NATION COMES CLEAR AS A CONCEPT.

MANAGING A NATIONAL PARK IN NEW YORK CITY

GEORGETTE NELMS

My career with the National Park Service has included a variety of roles. I have worked in Park conservation programs for youth and young adults, environmental education programs, and in community/public relations. I am now a Park Superintendent. Each of these roles has provided me experiences from which I have built anew. For me, the challenge has been to incorporate my life experience with the mission of the National Park Service.

My experience includes encountering a number of obstacles thrown in my way, notably because of my race and gender. People who have problem attitudes are ever-present today, but I've learned to confront them with less emotion and more authority, secured by a self-knowledge rooted deeply in the past. Why should I, an African-American woman, with a clear mind and firm purpose frighten anyone? I'd like to hope that my race and gender are no longer an issue, but they are. Even in the 1990's, many people prefer dealing with my white male subordinates to accepting me as an authority figure. This includes people inside and outside the Park Service.

Because of my unique position as the first African-American Superintendent of the Manhattan Sites, as well as the first female to hold that post, I believe that I have a particular sensitivity to our Park's urban audiences. Here, as in other urban centers, "minorities" now constitute the majority of the population.

The splendid traditions of the Park Service extend directly back 75 years to the establishment of the Service in 1916, and indirectly back to the creation of the first park, Yellowstone, in 1876. But these time-honored traditions have, however, little to tell us, as Park Managers, about operating within the conflicting pressures of today's urban environment, or of communicating

effectively with urban audiences. The Service and the traditions have preserved for millions of Americans the vestiges of a primitive wilderness, cultural resources, and the westward-ho pioneering spirit, but these vestiges are not always "owned" or "bought into" by urban minorities who come from different traditions. Making visitors, regardless of origin, see how the historic connections in this country relate to them is part of my job.

As I view my responsibilities, I feel an obligation to apply my own insights, derived from my urban background, race, and gender, to achieving the mission of the Park Service in the immediate context of New York City. Each day, as I administer the six historic sites comprising this Park, I am confronted with a new problem, suggestion, or demand. I must be gracious, yet firm in pursuit of the Park's purpose. I must be inquisitive, yet knowledgeable. I maintain this flexibility, both for the purpose of preserving my own sanity and in order to achieve as much unity of purpose as possible among all with a stake in how well Manhattan Sites does its job.

I believe that we all are better able to do our jobs—within the Service and for the public we serve—through our internal diversity. The National Park Service has provided me over the years with the opportunity to explore environmental issues, history, art,

and architecture. More important, however, it has allowed me to meet and work alongside many people of different social, ethnic, educational, and cultural backgrounds, interacting with others who are performing different duties. It is the mutual support of diverse individuals, with differing perspectives and resources, which has created the generally high level of performance of the National Park Service.

The duality of diversity and unity in our history

Each of the six sites for which I am responsible as Superintendent is different, yet each raises intriguing issues in its role as an "historic" site. Educators today are confronting challenges to our traditional concepts of what is "historic," and what constitutes the subject-matter of American history. The ethnic and cultural diversity of our society imply that our history cannot be meaningfully presented as the account of any *one* group. Yet must there not be some common ground upon which we can base our concept of our country's identity? I believe that it is useful to distinguish the history of the American people from that of our nation.

What I am saying is that the *social history* of America is a history of diverse ethnic and cultural groups, sharing in a common society. The *political history* of the American nation, on the other hand, is a history of the origins, growth, principles, policies, and transformations of a political entity, the United States of America. Thus we find, once again, the duality of diversity and unity.

Our job at Manhattan Sites is primarily to relate the political history of our nation through the interpretation of historic sites having national significance. The reason for this approach is that it is primarily for this reason that the Congress of the United States created these units of the National Park System. Secondarily, we attempt to person-



alize our history by relating these sites, and those individuals associated with them, to life as it was and is in New York City. The challenge, of course, is to communicate our given message to our given audience. If we should lose sight of either one, we shall have failed.

Visiting the sites

I would like to take you on a journey to each of the Manhattan Sites, in order to shed a little light on my job and to demonstrate some of the historical issues our park presents.

Federal Hall National Memorial. I will begin with Federal Hall National Memorial, the administrative headquarters, and location of my office. It is situated in a commanding location on Wall Street, amidst the hustle and confusion of the financial community, directly opposite the New York Stock Exchange. The historical significance of Federal Hall lies both in the events which occurred on this site, and in the building which currently stands here.

When the City of New York built its second City Hall in 1702, the structure was placed at the head of Broad Street, at the corner of the newly-surveyed Wall Street. Throughout the 18th century, this building was the center of local and colonial government, as well as a general court, jail, library, and temporary home to many local groups of all kinds. As a court, it was the scene in 1735 of the trial of printer John Peter Zenger. Zenger's acquittal of libel charges on the simple ground that he had printed the truth was to become an important foundation of our freedom of the press. As the American Revolution approached, Federal Hall was the meeting place of the Stamp Act Congress in 1765, and of Committees of Safety and Correspondence in the 1770's.

Following the Revolutionary War, the hard-pressed Continental Congress found a home at Federal Hall in 1785 and, in 1789, the newly-elected First Congress of the United States met here as well. Thus the old building became the first capitol of the United States. It was the scene of momentous events, including the inauguration of President George Washington and the passage of the Bill of Rights during the brief 16 months it remained the nation's capitol. Finally, in 1812, the old building was demolished when the City built its present City Hall.

Yet the importance of the site was not diminished, since, in 1842, a grand new Custom House for the port of New York was completed in the same location. This out-

standing example of neoclassical architecture still stands today, and has been recognized as both a national and New York City historic landmark in its own right.

Castle Clinton. Just a short walk from Federal Hall, down at the tip of Manhattan Island, lies Castle Clinton National Monument, another of our Manhattan Sites. Built as a coastal fort prior to the War of 1812, Castle Clinton was never to fire its guns in anger. It was transformed in 1824 into Castle Garden, a fashionable center of entertainment and public demonstrations. Most important, perhaps, was its role as the immigrant receiving station for New York City, when, between 1855 and 1892, it welcomed some eight million new Americans to our shores. Today it serves not only as a museum but also as the origin of the ferry service to Ellis Island, which followed Castle Garden as the immigrant entry station.

Theodore Roosevelt's National Historic Site. As our tour heads uptown, our next stop is Theodore Roosevelt's National Historic Site, found in the historic Gramercy Park area of Manhattan. The home of our 23rd president (and only "native New Yorker" to achieve that office so far) is located in a beautiful row of brownstones recalling the restrained elegance of the mid-nineteenth century city. This is the only Park unit currently offering furnished and decorated period rooms, and it truly conveys a sense of life as it was lived in style and comfort. The building itself is a reconstruction, lovingly created as a memorial to President Roosevelt in 1925, six years after his death.

Hamilton Grange National Memorial. The next two Manhattan Sites are both "uptown" in legendary Harlem, where names like the Apollo Theatre and Cotton Club are cherished. Hamilton Grange National Memorial was the last home of Alexander Hamilton, Revolutionary leader, author of many of the *Federalist Papers*, and first Secretary of the Treasury. The Grange, built in 1802, is a fine example of the graceful architectural designs of John McComb, Jr., also architect of New York's City Hall.

I am extremely excited about the prospects for renovating this structure, and creating period rooms containing original furniture and decorations here as well. Because of its important location in the community, I see this site becoming a magnet for young people in the area. There is a real opportunity here to create pride and a sense of participation in American history.

General Grant National Memorial. The second Manhattan Site in this area is General

Grant National Memorial, better known as Grant's Tomb. The largest mausoleum in the United States, this imposing building was completed in 1897 through the fundraising leadership of Richard T. Greener and the Harlem community. Greener, the first African-American to graduate from Harvard and a resident of Harlem, focused the attention of the nation on the importance of completing a suitable monument to Grant. Greener and the Harlem community wanted attention drawn to all those who sacrificed so much during the Civil War in order to bring an end to the curse of slavery and set our nation on its journey toward recognition of equality of all its citizens.

St. Paul's National Historic Site. Our final stop is Saint Paul's National Historic Site, located just north of the Bronx in Mount Vernon, New York. During the American Revolution, it served as a military hospital and burial ground. The adjoining cemetery is one of the most extensive colonial era burial grounds in this area, containing approximately 9,000 graves. Here, in 1733, occurred the illegal election which was protested by John Peter Zenger and which led to his trial at Federal Hall.

The human rights story

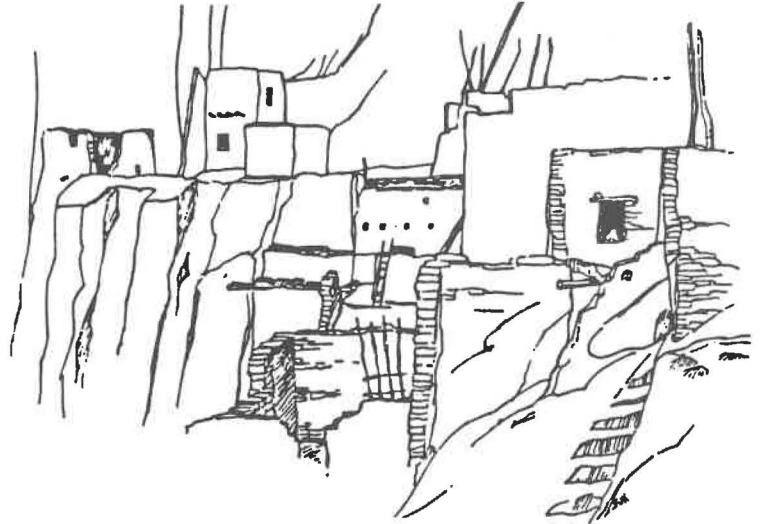
The story of Manhattan Sites is largely the story of the long struggle for human rights, played out in our nation's greatest metropolis by people of various ethnic and cultural origins. Early in our national lives we became aware of different experiences. Each site contributes a story to the whole of what we ultimately became. The same is true of individual lives: new experiences are a form of rebirth, from which we emerge a bit changed, and in possession of elements both old and new.

Georgette Nelms, prior to her current Superintendency, worked at Gateway National Recreation Area, and prior to that at the Environmental Protection Agency. She received a Dr. Martin Luther King, Jr. fellowship award in graduate studies. Her Bachelor's is from Fordham University, and her Master's in History is from St. John's University.

NAVAJO NATIONAL MONUMENT PRESERVES, PROTECTS, AND EXHIBITS THE AMAZING INDIAN RUINS THAT CAN BE FOUND THROUGHOUT THE SOUTHWEST.

CLASSIC PARK SERVICE WORK

ANNA MARIE FENDER



Set in the canyon country of the Western Navajo Reservation are the three small units that comprise Navajo National Monument. Visitors driving through the country on Highway 160 between Kayenta and Tuba City, Arizona, have no roadside clues to prepare them for what might lie at the end of the SR564. What lies ahead, however, are Indian ruins, cliff dwellings, and mystery about the people who once lived there.

Doing what the NPS does best

Set aside in 1909, the monument originally contained a huge 160 square miles, most of which was still unsurveyed. Betatakin ruin had yet to be discovered and Inscription House ruin was not included in the new monument. By 1912, under President William H. Taft, the monument was reduced in size to 160 acres around the Betatakin Ruin (newly discovered) and Keet Seel ruin. Inscription House ruin with 40 acres was added later. The total size of 360 acres make up the monument units today.

Inscription House ruins were closed to the public in 1968 in order to protect the area from unsupervised visitation. The structures have undergone some stabilization work during the past years, but almost no reconstruction has occurred; Navajo National Monument still remains some of the most "intact" ruins in the southwest.

This site was one of the classic remote monuments in the Park Service family. In the early years there was no easy way to get there; it did not fit the mold of a tourist attraction for the first few decades. With time, however, visitation to the monument has grown to over 125,000 visitors in 1992, a new record for the area.

Visiting the ruins is not for the faint-hearted

Most visitors walk the one mile round trip Sandal Trail, named after the brass footprints that at one time showed visitors the way across the open areas of rock along the rim of Betatakin canyon. Interpretive signs along the trail describe the plants and animals of the area, and a display at the over-

look provides visitors with more details about the ancient ruins. A telescope allow visitors to look across the canyon and into the alcove within the Betatakin ruins. Although most visitors will not get any closer than the overlook, they can see the still intact roofs and ladders in place. Many do not believe that it has been 800 years since the pueblos were inhabited.

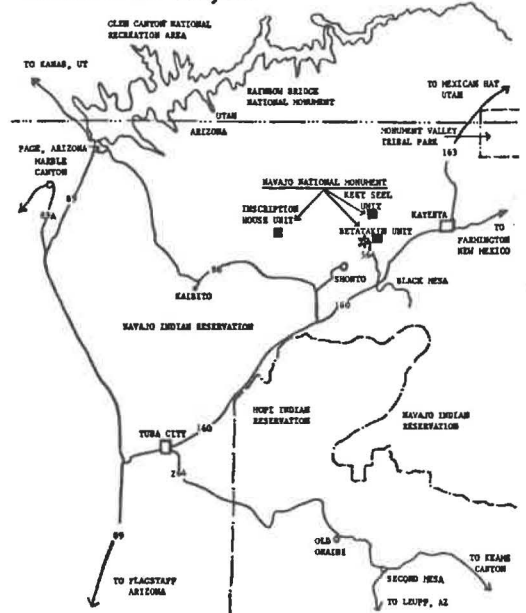
The visitor center museum provides a closer look at the many artifacts from the area and a "family home" room display allows visitors to relate to the size of a typical room group. A short slide-show and movie round out the stay at the monument. Some visitors stay the night in the small campground adjacent to the visitor center.

Betatakin (means "hillside house" in the Navajo language) ruin is the most accessible of the sites, but strict ceilings on the number of visitors limits the site visitation to about four percent of the monument's total visitation. Guided hikes are offered twice a day during the summer and are limited to 24 people. Tickets are available on a first-come basis at the visitor center the day of the hike. The chosen few meet at the visitor center then caravan to the trailhead. Approximately five miles in length and a six hour round-trip, the arduous hike starts by going out to Tsegi Point along an abandoned road then begins the 700 foot drop down narrow switchbacks into the canyon.

The trail then turns and heads up Betatakin canyon through Navajo reservation land which is heavily grazed by the local residents. The mouth of the canyon is dominated by pinon-pine trees, grasses, and sand dunes. A gate and fence mark the boundary of the park and almost immediately the vegetation changes to include Aspen and oak, an environment similar to the same environment the ancient Indians lived in nearly 800 years ago. The unique environment is de-

scribed as an "inverted" or "upside down" ecosystem because the vegetation, aspen and oak, found in the cooler, damp bottom of the canyon would normally grow at elevations higher than the rim top vegetation, pinon pine and juniper.

Betatakin ruin is located in a large alcove with a running spring. The rock, Navajo sandstone, is not as stable as it appears and frequent rockfalls throughout the last eight centuries have destroyed most of the center section of the ruin. The southern section of pueblo style dwellings is closed to the public and has remained mostly intact with original roofs still in place. The public is allowed to walk through the center section of the alcove and climb to a high ledge in the northern end where several rooms can be closely inspected. After an hour or more in the ruin, visitors are allowed to hike out at their own speed, giving many folks an opportunity to enjoy the unique ecosystem found at the bottom of the canyon.



Keet Seel ("broken pottery" in Navajo) ruin looks today just as it must have within days after the departure of the original inhabitants. Access is difficult: a strenuous 16 mile round-trip hike or a horseback trip through the canyon bottoms. This limits the number of people interested in visiting the area; only about one percent of the total visitation have the opportunity, time, and energy to visit Keet Seel ruins. Limited to 20 per day from Memorial day through Labor day, visitors can make reservations up to two months in advance for the ruin tour, but must either hike in and out the same day, or they can camp overnight at Keet Seel. Some visitors choose to ride horses out to the site with the local Navajo family that has the monument's horse operation.

No matter what form of transportation, visitors are usually in awe of the ruin when they first glimpse the alcove from below. The tour includes a climb up a long ladder, not for those afraid of heights, and a walk along the "street" that fronts the northern half of the ruins. The avenue through the southern half of the site is closed to the public, but visitors peering down the ancient path can almost see the inhabitants. Corn cobs, 800-years-

old, can still be seen inside the rooms that served as storage for the inhabitants.

Eroding natural resources

The cultural resources form the basis for the monument, but the natural resources both within the units and surrounding the park are of vital interest to the staff. Since the establishment of the monument, the erosion of the Tsegi canyon system has played a dramatic role in the changing environment. Today, at Keet Seel and Inscription House, the washes cut 20 to 30 foot gullies below the ruins, carrying away alluvial sediments and vegetation.

The environment of Betatakin Canyon, which is relatively untouched by erosional changes, is the example of what Keel Seel canyon must have once looked like. Some believe that increased grazing on reservation land surrounding the units is the major culprit in the erosional cycle. The debate may never be settled about the changing natural environment. Archaeologists have theorized, however, that the same natural



massive erosion may have been one of the reasons for the departure of the inhabitants 800 years ago.

Anna Marie Fender has been Superintendent since June 1992. Prior to that she worked at Flagstaff Arches, Natural Bridges, Arches, Rocky Mountain, and Black Canyon. She has been with NPS since 1971, when she began as a volunteer. Fender participated in the Women's Executive Leadership Program in 1987 as the very first NPS participant and the only participant from the NPS during the first year. This is a government wide mid-level management training program. During the course, she trained in the Rocky Mountain Regional Office, Bryce Canyon National Park, and four months in the Congressional offices of Congressman (now Senator) Ben Nighthorse Campbell, of Colorado. Fender's Bachelor's is in History from Ft. Lewis College, Colorado.

TENNESSEE SOIL CONSERVATION SERVICE HAS THE RIGHT KIND OF MEN

MARY K. DAUGHERTY

As women you've probably heard it many times. You have just had a meeting or received a report from one of the Special Emphasis groups and your male co-workers say something like "Well, when are we going to have a program for us?" This got me to thinking: why not?

There are many of the male persuasion who have contributed to the advancement and promotion of women in the Soil Conservation Service and they often go unrecognized in the process. So, we sent out a survey to every SCS woman employee in Tennessee to see who they felt had been the most influential in their career as a mentor, role-model, or coach.

The response was overwhelming—50 percent of the state's women responded with remarks that were positive and encouraging about males who had assisted them over the years. All that was needed now was a way to highlight this collection of comments and showcase the men who were positive influences on these women.

Jerry Lee, Tennessee State Conservationist, provided the opportunity with the suggestion to hold a luncheon around an upcoming women's event. The next big one was Women's Equality Day in August 1992. A pre-luncheon seminar entitled "Improving Your Quality of Life" was arranged with Anna Belle Clement O'Brien, the first woman legislator in the state, as speaker.

Reservations poured in from SCS and Soil Conservation District employees and their families for the luncheon and seminar. Forty of the 100 attendees were men.

The awards portion of the program began as a slide tape presentation set to music with a

narrative. Imagine the men's surprise as the narrator started listing the many favorable traits and qualities described by the women. Faces were shown on the screen.

Especially important, too, during our program, was discussion of the research done for the book, *Breaking the Glass Ceiling*. In surveying top female executives, the author found only one item had been named by all of them as helping them achieve their goals and move up the corporate ladder: *help from above*.

It was very encouraging to know that we in SCS-Tennessee, have several males in our midst who strive to show equality in the everyday things they do for others.

Mary K. (Kathy) Daugherty (pictured above) is SCS-Tennessee Federal Women's Program Manager and District Conservationist in the Dayton Field Office.



Award winners from left: Will Nesby, Tennessee State University USDA Liaison; Jeff Craig, State Administrative Officer; Jerry Lee, State Conservationist; Tommy Hunt, Cartographer; George Prewitt, Area Conservationist; and Jim Lansford, Resource Conservation and Development Coordinator. Not pictured, Bill Adams, Resource Conservationist.

SOME VERY GOOD AND NEEDED SCIENTIFIC WORK IS BEING DONE FOR NPS BY VOLUNTEERS. THIS ONE CAME ALL THE WAY FROM WALES.

A WINTER WITH THE BIGHORNS

VALERIE NAYLOR

Ann Humble is working on a bighorn sheep research project at Badlands National Park in South Dakota. A native of Great Britain, she is a biologist who is learning more about resource management in the United States by working in the field.

Since she is not an American citizen, a paid position was not an option. So Humble applied to the Student Conservation Association (SCA), a non-profit organization that places students and other adults in volunteer positions in parks and forests throughout the United States. The SCA provides a small stipend for food and part of her travel expenses, while the non-profit Badlands Natural History Association pays her rent.

Humble's assignment is to study bighorn sheep under the direction of Frank Singer, a National Park Service wildlife biologist who oversees—from his headquarters in Fort Collins, Colorado—bighorn sheep research projects in several national parks in the Rocky Mountain Region. The Badlands project is a full ecological study. It is designed to (1) determine the habitat areas used by the sheep for different purposes, (2) monitor the general behavior of the sheep, (3) determine the effects of prescribed burning on sheep feeding area selection, (4) calculate their home ranges and determine why they do not disperse from one concentrated area into adjacent habitat that by human standards appears quite suitable. The research also



(5) addresses diseases and lungworm, a prevalent parasite that often wipes out entire populations of bighorn sheep. Another goal (6) is to develop an aerial sightability model, an index that compares the number of sheep seen in ground surveys with the number observed from an airplane. Once perfected, the model will allow park personnel to make more accurate estimates of the sheep population from just an aerial count.

Audubon bighorn sheep once roamed the Badlands, but were hunted to extinction by 1925. In 1964, 22 Rocky Mountain bighorn, a closely related subspecies, were introduced into the park to restore a lost component of the ecosystem. The introduced population stagnated for nearly 20 years, but numbers have recently increased to over 150. Despite recent breeding success, the health of the herd is still fragile; one epidemic could wipe the sheep out. The current study should help park resource managers ensure the continued success of the bighorn population.

Originally, Humble was hired to assist NPS biological technician Kevin Fox to examine rutting behavior and mating success. When Fox left the park for a new job in Alaska, however, Humble continued the field work alone.

The Badlands were named by the French, who called them "bad lands to travel across." Badlands National Park consists of 244,000 acres of eroded spires, pinnacles and canyons, interspersed with mixed-grass prairie. While roads have made automobile travel easy for the sightseer, the backcountry terrain is extremely rugged. Add

South Dakota winter weather with sub-zero temperatures, knee-deep snow, and howling winds, and hiking in search of an evasive bighorn sheep is hard work.

Humble's typical day starts before sunrise. She drives to Pinnacles Overlook, a high point along the park's scenic drive for the "morning call." Using radio telemetry equipment, she determines whether the 21 collared and numbered bighorn sheep are still alive and their approximate locations. She then sets out to find a sheep that she has not observed for several days. Again using telemetry equipment she pinpoints the bighorn's location by triangulation. Then the hard work begins as she hikes into the 64,000 acre Badlands Wilderness in search of the sheep.

After Humble hikes several miles with a pack full of telemetry equipment and extra gear, she must approach the sheep without disturbing them or altering their behavior. On an average winter day, the sheep spend the early morning foraging on grasses and other plants. By mid-morning they generally bed down, getting up occasionally to graze. If disturbed by a coyote or other predator, they may run to nearby "escape terrain," the steep Badlands slopes that only bighorn sheep can comfortably traverse.

Humble usually observes and records the behavior of the target sheep and others in its group for an hour, noting its location and distance to the crucial escape terrain. On a recent day, for example, Humble scrambled up a slippery butte and peeked over the

top, trying not to alert the small band of bighorn sheep grazing on the other side. Suddenly, a large pair of curled horns popped up. The left horn was badly broken, a distinctive characteristic of just one ram. After five days of hiking, Ann had finally found the elusive "Number 2."

If there is fresh scat in the area, she collects it so that it can be analyzed to determine what the sheep are eating and the frequency of the lungworm parasite. She then makes the long hike back to the pickup. On good days, she returns to headquarters an hour before dark.

Despite frequent tough conditions, it is the field work that Humble enjoys. Her journeys into the Badlands backcountry have provided her with experiences that she will always remember. She has observed the classic head-butting behavior of bighorn sheep in the rut. The first bison she ever saw was charging toward her and Fox, and she once observed mule deer fending off a coyote with their hooves. A birder, she has seen golden and bald eagles and a rare snowy owl.

Since she knew of her assignment just two weeks prior to her departure from her home in Wales, she did not have time to prepare herself for the Badlands. Her grandmother dug out a 1927 edition of the *Encyclopedia Britannica*, and faxed her some ancient black and white photos, but the fuzzy pictures "didn't do the Badlands justice." Humble did not realize that she would be working in a prairie habitat, and the unique Badlands formations were very difficult to visualize.

Even though the topography is different, Humble is no stranger to the National Park idea. In Wales, she lives in the town of St. Davids which lies *within* Pembrokeshire Coast National Park. One of three national parks in Wales, Pembrokeshire protects 120 miles of rugged coastline and islands and is a refuge for birds and other wildlife. Because national parks in Great Britain were not established until

the 1940s after World War II, most are comprised of a combination of private and common ground. Many incorporate existing towns like St. Davids. There are strict building codes and restrictions on growth, however, so even if a homeowner just wants to build a porch on a house, permission from the National Park is required.

She also worked in Chillingham Park, a 320-acre private park which was once the grounds of a castle. Seven hundred years ago, the owner at the time, Lord Ridley, decided to keep some wild cattle within the 12-foot walls of his estate. Today, descendants of his herd are the last of England's indigenous white wild Chillingham cattle. Humble's job as a field researcher was to conduct a botanical survey of the park which is comprised of native woodlands and meadows and some ornamental trees. She also studied bracken (*Pteridium aquilinum*), a poisonous fern that is invading the meadows of the cattle refuge. Although the same species, commonly called brackenfern, is also found throughout much of the United States, it is rarely considered a problem. In Chillingham Park, however, the live bracken crowds out native species, and hydrogen cyanide compounds released by the dead ferns prohibit the growth of other plants. Since bracken has carcinogenic spores, Humble wore a face mask and protective clothing during the research project.

After she finishes her assignment with the Badlands bighorn, Humble will take the time to see more of the United States. Except for a look at the inside of the Minneapolis airport, western South Dakota is all Humble has seen of North America. She arrived in the United States on Halloween, and the first American she met was an Immigration Officer dressed as a ghost. Coming to the country just four days



before the presidential election was also an eye-opener, as everyone was talking about politics. Meeting cowboys and listening to country music, have also given her a different look at America than what she would have seen as a tourist. In comparison, she says,

Great Britain is very reserved: "In the United States, things just hit you between the eyes. It's larger than life."

She is applying for another position with the SCA, and is considering work on a master's degree in wildlife ecology in this country. Eventually, she hopes to complete a Ph.D. in England; perhaps again working in the wild cattle park. Humble has a Bachelor of Science Degree with First Class Honors from the University of Newcastle Upon Tyne in England. Her degree in Agricultural and Environmental Science with honors in Terrestrial Ecology required a thesis, which she wrote on "Changing Ecological Communities of Bryophytes (mosses and liverworts) on a Hillside."

She would like to learn more of the American perspective on conservation. Since Great Britain is so heavily populated, there is no true wilderness left, so natural resources must almost always be heavily managed. Humble observes that resource management is often less intense in the United States, and believes that there are more opportunities to preserve resources without actively managing them.

Author Valerie Naylor is Assistant Chief Naturalist at Badlands National Park. She supervises the seasonal park ranger-naturalists who educate the visiting public on the natural and cultural resources of the area. Other duties include coordinating the park's volunteer program and serving as the museum curator. She has also worked at Organ Pipe Cactus National Monument, Colorado National Monument, and Theodore Roosevelt National Park. Her B.A. and M.S. Degrees in Biology are from Eastern Oregon State College and the University of North Dakota.

Marilyn Nickels was named recently to manage the Bureau of Land Management's new Cultural Heritage Resource Division in Washington DC. She will have a \$10.7 million budget and management of an estimated four million archaeological, historic, and paleontological properties located on BLMs 270 million surface acres of public lands. Nickels came from the National Park Service where she was Chief of the Battlefield staff of the American Battlefield Protection Program where she implemented a partnership program to preserve 25 Civil War battlefield sites in 15 states. Her Bachelor's is from Mount St. Joseph College in Cincinnati, her Masters and Ph.D. are from The Catholic University of America in Washington DC. She has expertise in church history and African-American history.

Dona S. Chambers won an Urban Forestry Medal from *American Forests* for her work as a volunteer in Trees for Houston. She led the way in organizing the Houston/Galveston Urban Forestry Council in 1988 and is an active member and supporter of the State and National Urban Forest Council.

The Chief of the Forest Service, *Dale Robertson*, announced recently the opening of the Aldo Leopold Wilderness Research Institute and the Arthur Carhart National Wilderness Training Center, both in Montana. This is the 106th anniversary of Leopold's birth. He and Carhart were instrumental in preserving wilderness areas in the National Forest System which today holds 34 million acres, almost one-fifth of all NFS lands. The National Wilderness Preservation System today totally includes 95 million acres in 44 states. The new units will aid the Forest Service to train personnel and expand research and management into wilderness problems.

Jeff DeBonis leaves the Executive Director's position with AFSEEE, an organization which is devoted to forging "a socially responsible value system for the Forest Service, based on a land ethic which ensures ecologically and economically sustainable resource management." This group was largely Forest Service employees and FS oriented. He leaves to start another

organization—Public Employees for Environmental Responsibility (PEER) which will, he believes, attract membership from BLM, EPA, NPS, and others.

Yale's Admissions Director *Richard Silverman* has formed what he calls "alumni SWAT teams" to find out why women are staying away from enrolling in Yale's School of Organization and Management. Eleven years ago, the enrollment was 51 percent women, today it is 24 percent. In other schools, e.g. Wharton, women dropped from a 1987 high of 32 percent to 27 percent; UCLA's business school dropped 25 percent since 1980. Some administrators are theorizing that women are discriminated against in the workplace on pay and promotions. *Business Week* reported that there are few role models on faculties: only eight percent in the Top 20 B-School faculty are women. *Stephen Christakos*, Dean of Admissions at Northwestern points to the massive influx of foreign students, the vast majority of whom are men. Others theorize women don't want number-crunching jobs, are afraid to leave their current jobs in order to go to graduate school, or don't see the diversity in a business degree.

Judith Cordova, a 12-year veteran of the National Park Service and a native of Colorado, has been named Superintendent of Colorado National Monument, a 20,400-acre area near Interstate 70 at Fruita, Colorado. The site has some 400,000 recreational visitors per year and is noted for its colorful formations, dinosaur fossils, and relics of prehistoric Indian cultures. Prior to this assignment, Cordova was Equal Opportunity Manager for NPS's Rocky Mountain Region and the Denver Service Center (a 600 employee planning and design unit which serves the NPS nationwide) for five

years. Prior to that she was acting superintendent at Curecanti National Recreation Area and Little Bighorn Battlefield. Cordova is the first Hispanic woman superintendent and is active in the Hispanic community. She noted that she want to encourage young women of color to look into natural resource careers. Her Bachelor's is in political science from the University of Colorado.

Jo Ellen Force, professor of forest resources at the University of Idaho has been elected a Fellow of the Society of American Foresters for her outstanding service to forestry and the SAF. She was one of 27 members chosen in 1992 from the 18,000 member organization.

Barbara Mandula is leaving the editorship of *AWIS Magazine* (American Women in Science) and will be replaced by *Sheila David*. Writing in the January/February 1993 issue, Mandula noted that being the editor for more than a decade gave her a "unique vantage point for following the major issues concerning women scientists."

Susan LeVan, *Robert Ross*, and *Jerrold Winandy* of the Forest Products Laboratory in Madison recently received the USDA's Superior Service Award. The award was given for their research leading to improvements in heat resistance and durability of fire retardant treated (FRT) plywood used in roof sheathing. Their research led to the development of guidelines for the processing and use of FRT plywood, ensuring safer buildings and reduced costs due to damage or failure. Susan LeVan is the Assistant Director for Protection and Market Research. Her Bachelor's is in engineering science from the University of Virginia and a Bachelor's in chemical engineering from the University of Wisconsin. Robert Ross is Supervisory General Engineer; his Ph.D. in

engineering science is from Washington State University. *Jerrold Winandy*, is a Research Wood Scientist; his Bachelor's and Master's are in wood science from Purdue University.

Holly Wichman, Assistant Professor of Zoology at the University of Idaho, was awarded grants in the amount of \$105 million from the National Institutes of Health, and the National Science Foundation for her genetic study of mammals. Her work focuses on genetic parasites that cause mutations, and possibly cancer in humans. She studies genes that can move around on chromosomes. In the past, she worked on a wide variety of mammals, and is currently collaborating with *Oliver Ryder* of the San Diego Zoo, on genetic research with zebras.

Rosemary Maher of Fairbanks, Alaska was the only woman (six males) appointed to new three-year staggered term to the National Public Lands Advisory Council. The 21-member Council advises the Secretary of the Interior and the Director of the Bureau of Land Management on national-level policies and programs for the management of more than 270 million acres of public lands and resources under BLM jurisdiction. Maher is Chairman of the Board of Directors of Doyon, a private landholding company.

Women in Natural Resources celebrates 15 years of publication with the September 1993 issue. If you have a favorite article to nominate for reprinting again in that issue or a funny story about the journal to share with our readers—let us know. FAX it to 208-885-5878.

BORN AT A TIME OF CUT-BACKS, THIS PUBLICATION THRIVED BECAUSE NPS PEOPLE SUPPORTED IT.

PARK SCIENCE

JEAN WORTH MATHEWS

Like Topsy in *Uncle Tom's Cabin*, *Park Science* "just grewed."

As its creator and editor since its birth, I take what I hope is pardonable pride in the way this quarterly bulletin has caught among people in the National Park Service field—its role as an information "connector" among the 10 NPS Regions, and the support it enjoys from readers and contributors alike.

Park Science is a resource management bulletin whose title page carries this self description: "A report to park managers of recent and on-going research in parks, with emphasis on its implications for planning and management." Currently, it runs 32 pages an issue, which is double the size at "birth," more than 12 years ago.

In the summer of 1980, after 18 years of working in Washington, D.C., I requested transfer to my native Oregon. Since I had served my nearly two decades at the Interior Department as a speech writer for a succession of Secretaries and Assistant Secretaries (although based in the National Park Service for the latter dozen years of that duty), there was some question as to what I could do if I were to go "out to the Regions."

Don Field, who was then Assistant Director of the NPS Pacific Northwest Region, suggested that I might start some kind of "newsletter" that would substitute for the annual Regional meeting of research scientists and park managers—a meeting that fiscal constraints had eliminated.

Bear in mind, this was the summer of 1980. So, just two months before Ronald Reagan was elected, the maiden issue of what was then titled *Pacific Park Science* appeared. It was a modest 16-page publication, typeset and printed in black and white at GPO on regulation typewriter size paper, carrying articles about research in the Pacific Northwest national parks and written in layman's language, to make it accessible to both resource managers and interpreters.

In addition to giving park personnel an easily understood account of the scientific work going on throughout the Region, *Pacific Park Science* walked a careful tightrope that made it possible for scientists to share the gist of their work and its management implications with other Service personnel without

jeopardizing their ability to publish in the professional journals once the work was completed. As a most important result, the information about scientific research could be shared as it was happening in the parks, thus short circuiting the abusive time lag mandated by the glacial dignity with which such information works its way into the professional journals.

An additional benefit was that *Pacific Park Science* articles were directed not just to other scientists, but to the entire range of field personnel. An editorial guideline included the instruction to authors that they discuss management implications of their research, so that managers (who rarely read the journals) could make immediate use of the information.

Soon after the first issue appeared, in October 1980, there was a request from the Washington office of the National Park Service that the publication be made nationwide. I asked for two assurances: first, that we be allowed to continue as a purely Regional publication for a full year, to work out our guidelines, priorities, and standards; and second, that I need not return to Washington, D.C. to do the editing. Both assurances were given, and I wish I could say "The rest is history," but not quite.

One of President Reagan's first actions was to declare a moratorium on all government publications. In order to obtain clearance even to continue publishing, let alone start anything new, a whole minefield of requirements had to be negotiated. The initial trap to avoid was any generic term (such as newsletter, magazine, document, etc.) that was specifically banned. We searched the executive order and found that someone had forgotten to include the word "bulletin." Thereupon, *Pacific Park Science* became "A Resource Management Bulletin." The way in which it finally worked its way through the jungle of "approvals" necessary to gain the required okay from the President's Office of Management and Budget is another story, and one that might usefully occupy a full hour of a civics class. Suffice it to say that by dint of perseverance, animal cunning, and some questionable tactics that will forever be veiled in secrecy, the bulletin emerged in 1981 as *Park Science* and has continued so to this day.

NPS field personnel are both the heirs to and the reason for its success. They recog-

nized it at once as *their* publication; they detected none of the horn-blowing hoopla that too often accompanies publications that originate in D.C. and carry not only such central blessing, but the propaganda currently in vogue. The articles for *Park Science* have poured in, unsolicited, from every quarter of the National Park System. Its "departments" (e.g. Regional Highlights, Information Crossfile, etc.) were mostly created at the suggestion of field personnel and they continue to reflect the information and the presentation that field personnel want.

It is largely on account of *Park Science* that I regret I am not immortal. For reasons that are easily evident, I am currently less reluctant to lay down the reins of editorship than I would have been at any previous moment in the history of the bulletin. Throughout, my Region has been stoutly supportive of the effort to keep *Park Science* a faithful reflection of the field. This has entailed picking up a major portion of the costs for production, even though all 10 Regions contribute substantially.

I feel strongly that the continued success of *Park Science* in giving NPS field personnel a useful vehicle for communicating with one another lies in guarding the integrity of its mission and keeping its roots in the field. Only there can the science and management of the incredibly precious National Park System escape the withering winds of partisanship that too often blow out of the halls of central management.

Jean Mathews, Editor of Park Science, lives in Corvallis, Oregon. She was a reporter for The Dalles Chronicle, United Press (Northwest bureau headquarters in Portland), the Eugene Register Guard, the San Antonio Light, and the Westport/Fairfield Town Crier in Connecticut; political campaign writer (speeches, films, ads, etc.) for a New York ad agency (Communications Research and Advisory Corporation), all between 1943 and 1962. In 1962, Mathews joined the staff of Interior Secretary Stewart L. Udall as a speech writer and Information Officer, GS-15. In 1968, after writing and receiving awards for the first five Conservation Yearbooks for Interior, she voluntarily transferred to the National Park Service at a step down in grade. Mathews continued until 1980 as primarily a speechwriter for Secretaries, Assistant Secretaries, and NPS Directors, with ancillary duties such as news releases and producing environmental education materials. She retired in 1986, but has continued with Park Science as a rehired annuitant. Her Bachelor's is in Journalism with a minor in science from the University of Oregon.

MEADOW CREATION, EXOTIC PEST MANAGEMENT, ARE PART OF THE JOB WHEN YOU WORK AT A PARK IN THE MIDDLE OF WASHINGTON DC.

MANAGING THE VEGETATION AT ROCK CREEK PARK

PEGGY FLEMING

The bees in the visitor center exhibit hall at the Nature Center in Rock Creek Park were ailing. In evaluating the cause we realized that there was not a sufficient food source for them in the summer. Over the years the habitats in the park on which bees depend had been reduced to riparian, mowed lawn, and mature second growth deciduous forest. Missing, for the bees and the ecosystem, were the early successional stages of meadow, brambles, and pioneer trees.

In January 1977, I was hired as a temporary intermittent Park Ranger in the Resources Management office to implement a meadow management program. Now, still a Park Ranger, permanent part-time, in Resources Management, I am the vegetation management specialist and deal with many plant related issues: meadow management, exotic pest plant management, a voucher collection for an inventory of all the vascular plants in Rock Creek Park's jurisdiction, protection for significant indigenous species, and coordinating the planting program for areas other than the annual flower display beds.

Rock Creek Park

Approximately one fourth of the city of Washington D.C. is under the jurisdiction of the National Park Service (NPS), National Capital Region (NCR). Rock Creek Park (RCP) is one of five administrative units of NCR that cares for NPS land within the city. Rock Creek Park's jurisdic-

tion covers approximately 3,000 acres and includes natural, cultural, and park development zones which include recreation areas.

Approximately 90 percent of the area under Rock Creek Park's jurisdiction is zoned natural and is, therefore, under the protection of the legislative mandate for "...protection of natural resources and values...while ensuring their availability to future generations." (Management Policies, National Park Service, 1988). These natural areas are particularly significant because they are remnants of the eastern deciduous forest ecosystem and provide habitats for the diversity of plants and animals that are still here. Being surrounded by the city, the natural parks provide refuge for visitors as well. The parks are threatened by urban development: buildings, roads, commuter traffic, recreation needs, and utilities corridors. The challenge of my job is to manage and protect our natural resources.

Meadow Management

Most of the Rock Creek Park meadows were formerly mowed lawn. The meadows came about by simply not mowing designated sections of the lawn during the growing season and allowing herbaceous growth to occur. All the meadows were located in areas that were not actively used by visitors. Most of the meadows have a woodedge on one side and mowed lawn on the other.

Educating the public took several forms. Meadow signs were placed in the meadows to announce the changes that would be

happening: the Nature Center Interpreters gave special related programs; local publicity to alert the public to the coming of this successional habitat appeared in the *Washington Post* and on local television.

There are now 21 meadows, occupying about 20 acres. They are managed, which means they are mowed once a year. Mowing occurs early in the spring, before bird nesting activity. By delaying the mowing until then, food supply and perching places are left for the animals over the winter. Year around the meadows offer the best habitat for bird activity, especially during the spring and fall migrations.

If the meadows were not mowed they would succeed on in just a few years through brambles into forest. The main problems with meadow management in the eastern deciduous forest ecosystem are (1) exotic pest plants and the (2) naturalness of the meadow to grow to forest.

The Rock Creek Park meadows are now 15 years old and most of them have one or the other situation. Our current challenge is how to deal with both problems. Returning a meadow to mowed lawn, (mowing 15 times in one year), for up to three years is not effective in controlling either the exotic pest plants or the woody vegetation. So seasonal rangers are digging out the roots of exotic vines in selected meadows. In 1993, we will be trying different mowing patterns including allowing new meadow to grow in current lawn and returning the older meadow to lawn.

For the first, second, third and eighth years, I ran transect lines in five meadows to record what happened when mowed lawns were no longer mowed regularly. I found that: native species eventually outnumbered exotic species; native annuals, ragweeds (*Ambrosia artemisiifolia* and *Ambrosia trifida*) and tick-seeds (*Bidens* sp.) increased in abundance; grass species diminished in frequency; vines, saplings and brambles increased; plantains, thistles, dandelions and clovers did not persist. Birds, butterflies, small mammals, and insects responded to the presence of the new habitat.

Monitoring the meadows is essential. It is easier to respond to the problems when they are still small. For diversity in a meadow we found there is no need to do plantings. However for aesthetics one might want to plant. If planting native wildflowers in the meadow, it is best to use plants instead of seed, use common indigenous species and buy from reputable nurseries.

We maintain extensive photo documentation, which is labeled and filed in the office. A Meadow Management Action Plan is filed in the Resources Management Plan.

Pest Plant Management

The key words to understand when dealing with flora and fauna in natural areas are indigenous/ native/ introduced/ cultivated/ exotic/ alien. "Indigenous" and "native" mean naturally occurring without having been introduced by people or animals. A species or sub-species is indigenous if it grows and spreads without human intervention. Generally this means having been in a location for at least 400 years. Under this ecological definition native and indigenous are synonymous.

"Introduced," "cultivated," "exotic" and "alien" indicate plants or animals that were brought into an area (across natural barriers) by people and were not previously there. Exotic species are those that occur in a given place as a result

24 WOMEN IN NATURAL RESOURCES

of direct or indirect, deliberate or accidental actions by humans. An exotic species is not a natural component of the ecological system characteristic of that place. If "introduced" plants are reproducing and are commonly occurring they are "naturalized," but not "indigenous." The terms indigenous and exotic must relate to the given site being addressed. Conflicting definitions and inaccurate use of these words occurs regularly.

Exotic pest plants are the number one threat to the natural resources of Rock Creek Park. And the most critical element of my job description is Exotic Pest Plant Management. I have compiled a list of 41 of the most aggressive problem exotic plants. Mapping of the locations of these plants is underway. A current prioritized list of sites for exotic plant removal is maintained, for scout and school groups and other volunteers.

Research on ways to get rid of three pest plant species has been completed. These species are kudzu, *Pueraria lobata*, wisteria, *Wisteria sinensis*, and English ivy, *Hedera helix*. Dr. L. K. Thomas, Jr., Research Ecologist at the Center for Urban Ecology, NPS, directed the research and made management recommendations: getting the target exotic out of dominance, with Krenite or Roundup for kudzu, and flame wilting with a kerosene torch for English ivy, and then hand grubbing the regrowth.

Since 1987 we have been implementing his recommendation for kudzu. As of 1992 kudzu is still in the park, but it is less than one percent abundant in any of the 36 sites. (In contrast, there were more acres of kudzu than meadows before eradication of kudzu began.) Each year a small crew of seasonal rangers searches for the trailing kudzu vines and digs out the roots or applies Ammate to the cut crown if removing the roots would cause considerable soil disturbance. Since succession occurs on all the kudzu

sites once the kudzu is removed, increasingly more time is spent looking for the vines than is spent on digging out the tubers. Even when kudzu is not found at a site for several years, the site needs annual monitoring. The tubers are up to two meters long and can produce new growth after being dormant for a few years.

The goal in exotic pest plant removal is to have native species fill the vacated niche. When the exotic plant that had been in dominance is removed, the area is opened up for succession. If the exotic plants can be removed gradually, the native seed sources can revegetate the area. So in situations where there are just a few exotics surrounded mainly by indigenous plants, treatment is to remove all the exotics, usually by careful hand pulling. Removal begins at the outskirts of the growth, where the exotic density is the least and moves towards the more dense exotic growths. The removal of exotic pest plants becomes trickier in the sites where several aggressive exotics are growing since removing one exotic opens up space for the remaining exotics to spread. A satisfactory approach for this situation is still being pondered.

Additional exotic pest plant management research has been done. Japanese knotweed, *Polygonum cuspidatum*, is being studied by Leslie Seiger, a PhD graduate student. My own field studies target base information on the three most aggressive threatening species: lesser celandine, *Ranunculus ficaria*, porcelain-berry, *Ampelopsis brevipedunculata*, and Asiatic bittersweet, *Celastrus orbiculatus*. For a year, 1987-1988, I made a weekly collection of lesser celandine to have a record of the plant's morphology. Based on this collection, it is known when the plant forms roots, leaves, flowers and seed. The specimens are mounted, labeled, and in the park. Various cutting methods have been tried on the vines porcelainberry and Asiatic bittersweet.

To determine what is most effective in reducing resprouting we have tried multiple cuts, covering stumps with black plastic, smashing the stumps, and digging the roots out. All removal techniques are quite labor intensive and require repeat treatments. As we have staff we will implement control measures for wisteria and English ivy and the other exotics. We will continue to enlist research on control methods for the remaining pest plants on the list.

Exotic pest plants arrive in the park in many ways: through grass/legume lawn mixtures, top soil, rip rap, root balls of nursery material, from neighbors' yards and dumping in the park, from plantings by the Park Service, by animals (especially birds and raccoons), through horse feed, and even from green thumb happy gardeners who take a section of the park as their own.

Much of the interior of Rock Creek Park has a limited number of exotics. Substantial amounts of the edges of the park, however, whether the edge is road, streams or trails, are affected. Usually there is an impenetrable wall of exotic pest vines smothering the edge habitat and unchecked, moving towards the interior.

Extensive photo documentation with labeled slides are in the office. An Exotic Pest Plant Action Plan is being written and will be in the Resources Management Plan.

Inventory of vascular plants

Since 1986, Raclare Kanal, a Volunteer, and I have been collecting voucher specimens of the vascular plants in natural areas of the District of Columbia. We have approximately 700 species for Rock Creek Park. Close to one third of the species are "exotic." They are on loan to the Smithsonian Institution and part of The District of Columbia and Vicinity Herbaria. This collection will be used, along with the historic collection of 90 years

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ago, for a publication of the vascular plants of the District of Columbia.

Learning about the species composition and their relative abundance in the park has been helpful in determining which indigenous species are significant and need to be protected as well as having a better understanding of the threat of the exotic species.

Succession is best

Being sure the correct plants are ordered and planted is another aspect of my job. I coordinate the annual planting list for natural and landscape areas. Throughout the year, I maintain a file for park-wide planting needs. For natural areas, I evaluate the conditions of each site (dry, wet, shady, sunny etc.) and check what common native species are growing adjacent to the area. Only common native species are planted when planting is necessary in the picnic groves, parking medians, etc. Plantings in natural areas follow ecological rather than horticultural principles. For landscaped reservations, I request and review all landscape plans and review plans for land adjoining park land.

In the past, when park roads were improved, bridges repaired or trails refurbished, the disturbed areas were replanted for erosion control as well as for aesthetics. As often as not exotic species were planted because they were the current "in" plant and available in nurseries. The most common native species in the park are often not available in the nurseries.

Our current thinking is that planting should be the last step. If possible, an area should be left

alone and succession should occur. If exotics start coming in, they should be removed. If cover of the soil is necessary, use clean, seed-free straw. If the area is

steep, secure the straw with biodegradable netting. If planting has to occur, we use only common native plants that are already growing proximate to the site.

Several problems arise with ordering nursery plants. The common species may not be available. For example the flowering dogwood, *Cornus florida*, is mainly available as an improved variety and plain, unimproved *Cornus florida* is hard to find. For the nursery to grow the desired native species, several years notice may be necessary. My experience is that even when we have indicated the botanical name on our plant list, approximately five percent of the plants we receive are not what we ordered. I have prepared a list of common indigenous species of Rock Creek Park—trees, shrubs, vines, ferns, grasses, wildflowers—with a list of nurseries that supply these species, as a handout for use within the Park Service as well as to give to developers and contractors. Otherwise, when buying from a nursery, one does not know where the plant was grown or where the seed is from. In addition, the root balls are full of "exotic" plants and fauna as well. Even in lawn grass mixtures the "weed" seed percentage is listed and the legumes all prove to be invasive species. From my experiences with exotics, they are all suspect and should be treated with extreme caution.

Peggy Fleming began working for the National Park Service in 1977. Before this, she worked on Civil Rights issues for John F. Kennedy when he was a Senator and then President. She has taught 6th grade, and was an anthropologist with a multi-disciplined team studying the drought in the Sahel, West Africa. She has an MA in Cultural Anthropology from George Washington University and a Certificate of Accomplishment in Natural History Field Studies from the Graduate School, USDA. Her publications include: "Newly Documented Species of Vascular Plants in the District of Columbia," The Journal of the Southern Appalachian Botanical Club, CASTANEA 57(2); and "Annotated Checklist of Vascular Plants in Rock Creek Park at the end of the Twentieth Century" is in progress.



MARIE RUST

AN INTERVIEW BY DAINA DRAVNIKS APPLE

W E R V I E W I N T E R V I E W

WiNR: As I understand it, your family lived in Brooklyn, New York when you were growing up. When we interviewed Denise Meridith (now Director of Eastern States for the Bureau of Land Management) she said she grew up there, too.

Rust: I know Denise quite well. I did not know Denise growing up, but it is incredible how our paths have crossed. We had a very similar childhood. We certainly do understand Brooklyn and urban life and have all the scars and the joys to prove it.

WiNR: I'm sure that not all NPS people want to be brought up in a big city.

Rust: No. As an employee of the National Park Service, one of the highest compliments you can have about yourself is to say that you were born in a national park. I was born about five blocks from the present Gateway National Recreation Area. So, I take some credit for being born *near* a National Park. I enjoyed the beaches of Gateway, Riis Park, Sandy Hook in New Jersey, and then I grew up around a recreational and a lovely natural resource, called Jamaica Bay Wildlife Refuge.

WiNR: Where is that located?

Rust: At Brooklyn in the Jamaica Bay Unit of Gateway National Recreational Area, a wonderful refuge full of birds. In fact, it is my understanding that there are almost as many species as in the Everglades. The variety and the natural wonders of that area are spectacular—very important for New York City people. Even when I was a child, we visited it while it was under private management. Indeed, the very resources that I enjoyed and grew up in, I ended up managing, which is absolutely incredible. I would never have thought that when I was a kid growing up in Brooklyn. But everything evolves—Gateway was not a national recreation area at that particular time, it was a conglomerate of city beaches, military installations, even New York's first municipal airport, Floyd Bennett Field. But I did know such places as Cape Cod National Seashore. I had also visited Acadia as a youngster, and I was most impressed by a summer visit to the Tetons. I really did not understand the "national park" concept, however, until I had seen the Tetons.

WiNR: Did you have the classic 50s television family life?

Rust: I grew up in a religiously diverse neighborhood, probably 90 percent Jewish. My high school experience, mixing with a different group of young people from a different religious background, I think,

shaped me. It sounds funny, but I did get to understand the different ways of coming at things. I had been brought up in a Catholic home. My parents were strict and religious, but I did not go to a Catholic school. I think they felt that the education in the public schools was better. And I think it was, it was a fine high school. My parents would not let me go to Europe, so I hatched a plan to go to Marymount College which had a junior year abroad program. That would be a great way, I thought, of my getting my parents to let me go to Europe because I really wanted to learn French. I also wanted to study in the Institute of Political Studies in Paris. I have been pretty much fortunate enough to do the kinds of things that I like to do. I guess I would say that I was lucky.

WiNR: In reading your resume, I notice you have a degree in economics and French.

Rust: I really wanted to major in French, but they told me I would never get a job, so I then used my practical nature and said that I would go into the economics and political science end of it, which is what I majored in.

WiNR: What did you do after you graduated?

Rust: I went on to work for a number of non-profit temporary agencies, such as the Council for Student Travel, The Ford Foundation. I knew French and was able to work in the international community. I was involved in a great many student exchange programs because of the French and because of the fact that I had lived and worked in Europe. I then earned a Masters degree in what today would be called Public Administration at Columbia. I was trying to decide whether or not I wanted to go to law school and use all of my international experience to become an international lawyer. I was very interested in solving problems and in human resources. I spent a lot of time in foreign countries working with different cultural groups. Having studied politics and economics I understood the problems between people and I was very interested in the whole realm of international relations.

WiNR: When you say you travelled and worked in foreign countries, was this representing the non-profit organizations?

Rust: Yes, and then while I was in school in Europe I worked to support myself. After I finished my Masters, however, then I got married. My husband at that time was studying for his Ph.D. and one of us had to work. I had begun law school, but, as you very well know, it is difficult to have two students in a

family. He was a political scientist. He had a legal background. His research was in international politics and I, of course, was very much interested in that. I thought his research work was excellent. I did not feel bad that I could not start law school for a year but I had to find a job.

WiNR: What kind of work did you do?

Rust: My first job was as a teacher of social studies and English in what was called a 600 school for emotionally disturbed young people. This happened to be out in Staten Island with young women who were junior high age. These young women had been brought to this religious institution, which had a public school on its grounds, because the court believed they had problems that came from their home atmosphere. I thought I was not competent to do it because I really thought they deserved special treatment. What the heck could I offer them?

WiNR: Was it emotionally tough to work with them?

Rust: It was emotionally scarring for me. We talk today about battered women and abuse against women and children as if it was a new thing. But it has been there a long, long time.

WiNR: You were really like a counsellor, too?

Rust: It was a real test for me. These were African-American, Hispanic, and white youngsters, who came from the pits, the ghettos of New York City. They would tell me everything that was wrong with me, what they did not like. They were quite frank. They were not interested in me, in the books, the school, life, or their parents whom they hated.

WiNR: How long did you work as a teacher there?

Rust: Two years. I used to find comfort doing a lot of walking and hiking on the weekend in New Jersey, because this job really was a killer. But from that experience I learned to relate to people who came from different cultural backgrounds.

WiNR: What was next?

Rust: My husband got a job at a university in Boston after his Ph.D. which was great. I also needed a job, but I was not sure whether I wanted to go back to law school. I thought about the theater. I was just all over the place—not focused to one particular thing.

WiNR: What kind of work did you start with?

Rust: I began my civil service career with the Department of Defense, mainly in administration because of my degree in economics—budgeting, programming, contracting, in-take programs were thrown at me. They needed personnel people. They needed people to do college recruiting. I was into everything.

WiNR: Then you went to the Park Service?

Rust: I had a friend, Larry Bemby, who went to the National Park Service from DOD. NPS had just reorganized, created a new region, and opened a Boston office because of the bicentennial celebration and all the new parks coming on. The North Atlantic Region had been part of Northeast Region, headquartered in Philadelphia. He told me to apply for a job. My knowledge of parks was limited as I just mentioned to you. But I came in as a GM-13.

WiNR: Why did they hire you?

Rust: When I was interviewed I was asked if I knew anything about New York. I said quite a bit. Then they started naming sites in New York City, many of which I knew. I knew about Franklin Roosevelt's house, Grant's Tomb, and the Statue of Liberty. And then they mentioned Gateway. I had been on those beaches many times. What also happened was that no one in the Park Service wanted jobs in the new region. It was eastern, it was Boston—everybody had heard about what Boston was like. You know, cold, expensive, not much fun, big city, pushing around. New England is not known to be friendly, certainly New Yorkers have a bad reputation. There were very few candidates for the job, to be perfectly honest.

WiNR: So you got the job. What then?

Rust: I was personnel officer and set up the new office. When you set up a new office you begin from the ground floor. There was not a record, not even a form, nobody even knew what they were. I had to beg, borrow and steal from all these other regions, which was good, because then I had to get around and got to know everybody. I got immediately into the Park Service culture.

WiNR: Did you experience any impediments or other kinds of discrimination because you were from a different kind of background or were a woman? Did you sense any of that?

Rust: Yes. Definitely. Being from the East thing was very difficult because they did not think I knew anything. I would not know a natural resource if I looked it square in the eye and I did not know anything about rivers and mountains—was their attitude. On the other hand, I want to compliment the Park Service people of those years, in that there were those who wanted to teach you if you were interested. They were the teachers and I sat for weeks and months and years listening to Yellowstone stories

Marie Rust is Director of the NPS North Atlantic Region. She is the highest ranking woman in the Park Service.



and listening to Smokey stories and listening to Yosemite stories. They brought me into their family because of the fact that I was interested. And seriously, they had fun educating me.

WiNR: Personnel could have been dead-end, couldn't it?

Rust: Yes, but I had learned I was able to do a number of service-wide programs. I set up a lot of in-take programs in the East, either as pilots or transferred them elsewhere. I became part of service-wide task forces so I got to understand similar problems in other areas of the service. You know as well as I know that personnel issues are intricately tied to the natural and cultural resources of the Park Service. You can not preserve the resource without the human resource. I got to know a lot of parks, I got around to the regions, I got to know the Park Service real well in the six years in the position due to those service-wide programs.

WiNR: What then?

Rust: I went into the Department Management Training Program in Washington, DC for two years. I worked at Interior level on assignment in legislation. I spent time on the Hill, on both the Senate side and the House side. I also took details. Larry Bembry had acted as a mentor so I asked if he knew a good place for a detail and he said he knew just the person to talk to, Denise Meredith. She said she was leaving and asked if I would like to be detailed to Sacramento. I said, "Are you kidding? You don't even know who I am." She said, "Yes I do." That is the beginning of my friendship with Denise Meredith. I sat in her job for two months and was exposed to this fantastic western natural resource.

WiNR: But another decision after that.

Rust: Yes, after that I was asked to go back to Boston to my home office. In fact, I was supposed to go back to my old job, which I really rejected, because I had gained all this terrific knowledge. You know you think you can do anything after a training program! Other parts of the Park Service were offering me jobs in other areas. There was an opportunity, for example, to work as an assistant superintendent in a very large park. But the Regional Director, Herb Cables, asked me to stay because of a real problem in operations. He also had been my mentor and had helped me get into the Departmental Management Training program. I said, "You don't have the job." He said he would create a job and he did indeed. I came back in 1983 as the Deputy Associate Regional Director of Management and Operations. I had spent a long time in

this training program, running around parks and gaining understanding about how you operate them. I was a breath of fresh air, perhaps, in a place that could use a little bit of a push.

WiNR: What do you mean, a little bit of push.

Rust: The operation wasn't functioning very well. Priorities weren't been set and deadlines weren't being met. New programs couldn't be started given the amount of work and the level of chaos. The regional director wanted things done right. At that time in the Park Service a new operations evaluation program had come on-line. He wanted me to come in, move a couple of bodies, energize the place, put up the programs on-line, build a team, and talk to the field.

WiNR: Field folks don't always respond well to shakeups. How did it work?

Rust: I had to make the field understand that there there were good people like me who would respond to their problems. I wasn't going to pretend that I knew law enforcement or was a law enforcement ranger. But, I certainly could recognize a law enforcement problem when I saw one and could use the skills of the people in operations to help them. There was a lot of tension at first because people within the organization saw me again as an outsider. Here she comes back from a training program. What does she know? She doesn't have 25 years experience working in Yellowstone. All the same things I experienced when first coming into the Park Service came out again. While they were willing to accept me as someone who knew something about X, they weren't willing to accept me as someone knowing something about Y. What they didn't understand was that it is not knowing the Y, it is knowing how to manage. Management means how you utilize your resources and how you work resources. The associate director was the first to recognize that I was there to support him. We got along. The Chief Ranger in the region, however, resented me for all kinds of reasons. All of the typical reasons. I wasn't a Westerner, I was a woman, I didn't have the same training he'd had, I never wore a gun, you name it. We became friends later, I'm glad to say.

WiNR: Did you have a lot of support during this period?

Rust: Yes, from the Regional Director, Herb Cables, who is now NPS Deputy Director. I also had very good contacts in the administration because I knew Jim Ward. Tom Ritter spent hours with me talking about operations and evaluations. People like Jack

Ogle, the Deputy of the Southeast Region right now, taught me the system, took me out into the field. So, in terms of mentors, yes, I had people in the Washington office and the other regions that brought me through this transition. I also knew how to get budget figures. I knew how to get personnel figures. I knew how to run administration.

WiNR: How long were you in that position? Were you able to get the things done you had been hired to do?

Rust: I was there from 1983 to 1987 and we had a number of projects. I'll give you some examples: We had to bring on-line the repaired Statue of Liberty. As you know the opening of the Statue of Liberty in terms of law enforcement and region-wide coordination was a difficult undertaking. The opening ceremony, fire works, the very famous people who came, and the security operation came out of the regional office. All of that I was very much involved in. Another was building the fire program. There was a great fire in Acadia many years ago and we wanted to establish a fire management program in the North Atlantic Region. Receiving funding for it was something we worked very hard on. We were determined to secure more funding for natural resource projects for a number of areas and we were successful.

WiNR: Getting back to the chronology, what happened in 1987?

Rust: The Associate for Operations retired. I was really ready to leave to find something in cultural or natural resources. The Regional Director leaned on me not to leave. He said not only did the Associate for Operations retire, but the Associate for Administration also retired and we had problems in administration. I knew it was a tough job. It was also a powerful job and that entertained me quite a bit. I was career-minded and I thought it would be a nice stepping stone. Also, I had some personal difficulties that I needed to work out at that time and I felt that it was very important for me not to leave the area. Again, it was a difficult transition because I was moving out of one area into another area and I had already alienated the people in the new one. That happened because I was telling them earlier how badly they were running administration—now I was sitting there and was the head of it.

WiNR: You don't shy away from controversy, do you?

Rust: It's easy to criticize other people. But when you have to produce now what you said you wanted them to do, the shoe is on the other foot.

WiNR: How do you turn that situation around so they are marching in line with you on the same road at least?

Rust: I basically decided to create a revolution. What I mean by that is that I was going to boost this area. So, what did I do? I moved people. I switched people around. One of the best persons I had was leaving, a young woman who was getting a promotion to Fish and Wildlife, and I said you're not going to leave. We need you. So I simply moved the person who was in the job that she would have done very well in, out of that job to another, because he was good also at doing something else. I also moved the problems. I brought with me the knowledge of how to make deals. I simply knew what I wanted to do. I knew what the area could become. And I got the kinds of people in place that could make it happen.

WiNR: You know, that is really interesting, because there are such extreme limits to the federal personnel system. To move people around to any significant degree at the lower grade level, below senior management level, takes a lot. I guess your personnel and budget background really helped you figure out how to do that.

Rust: That was very handy. Knowing where the money was was also important—I knew how to put my hands on money. I knew operations well. I understood what the parks wanted in administration. You see, to be able to do that kind of thing you have to get field support. The field wanted changes in administration so I simply went to the Regional Director and said look, you've got to do this because this is what the field wants. And he would say, well, how do you know that? And I would show him how I knew that. The field said you have to get rid of such and such. My attitude is that it is their program. If they are unhappy, they have to tell me why they are unhappy. Because of my attitude, I got a great deal of support. A key element to it was that I also brought in superintendents from the field to critique the administration

area. One superintendent did our survey, sent it to the field areas, critiqued the field areas, and told me what was wrong. I didn't have to tell them what was wrong. They told me. Given that kind of ammunition, you have to have your head in the sand if you are a Regional Director not to move. So I kind of said there was no other choice. He was a very fine Regional Director and very supportive, but he wasn't easy. When everybody is vying for attention, you have to build support among your constituencies. The constituency was the field.

WiNR: Give me some examples of what happened.

Rust: We instituted special pay for rangers in the North Atlantic Region as a model. In New York and Boston, because of the high turnover, we needed to have a pay differential to attract rangers. We made our case because of our turnover. What do I mean by turnover? In some cases, in the ranger ranks, 25 to 35 percent.

WiNR: Turnover is terribly expensive for the agency.

Rust: It is. The point is, though, that the increase came about because what we did was respond to the field problems. The field superintendents were saying, hey I can't keep people, how am I going to keep people? They want more pay. Why should they stay here and pay \$500 a month rent when they can go to Wyoming and spend \$200 a month on rent. We then also started a program called Stars. It really was a strategic program and a recruiting strategy not only to pay people the pay differential, but to go out there and recruit like crazy, to tell people about the resources here in this region. We used the *Wall Street Journal*. We used the *New York Times*. Those are expensive advertising venues. We used any kind of recruitment thing we could to bring new people, people who had been in or out of the agency, into this region. We also used a concept of a better quality of life—trying to make their life better

here. We started in-take programs. When I became the Associate for Administration in this region we had at least 70 percent of our administrative officer jobs in the field vacant. So we knew we had to do something about AO's so we started in-take programs to address that.

WiNR: You said this went on for about two years until 1989. What happened then?

Rust: There was a change in Regional Directors at this particular point. I was very happily the Associate for Administration and having a lot of fun. Jerry Patton, the new Regional Director didn't think he had the right people at the Directorate level in the right jobs—so after an operations evaluation and the background that came from it, he decided, obviously, that he had to make some changes so he switched people around. Basically he switched me from the Associate for Administration to the Deputy. So I lateraled into the number two position as Deputy. And the Deputy lateraled into the Associate job I had.

WiNR: The Deputy position has a lot more variety, doesn't it.

Rust: Yes. It was great. Terrific. It was the change I had been looking for. Instead of being just support, I was more involved in operational problems in the parks. It also gave me the opportunity to move more into the area of park planning and I enjoyed that, and also into the area of legislation, which I knew something about. But I also knew a lot about the construction program from the point of view of budget and understood it.

WiNR: What is the Region's budget? Is it enough?

Rust: It's about \$70 million which is not enough to run our 42 areas to standard. Comparatively, we have the largest maintenance backlog of any Region in the system. Our parks are small, exquisite jewels, for the most part, except places like Gateway. Frankly, no one should be surprised about the cost of doing business in New York City or Boston or anywhere in the industrial north-east. It's very expensive.

WiNR: Were you in the Deputy position until you became Regional Director?

Rust: I was there two years—until July 1992. But shortly after I became the Deputy I applied for the SES program so I was away more than I was here. Then when I came back from the Senior Executive Service program, which was in January 1992, I felt I was going to leave. I had applications out.



WiNR: But you didn't leave. Why?

Rust: Just as I was coming back, the Regional Director told me that he intended to leave. He had a wonderful opportunity to become the head of the Office of Strategic Planning in Denver; he loved strategic planning and he loved Denver and would do a fantastic job. So, I became Acting Regional Director in January until July of 1992. During that time I did not know whether I would remain in the region or not. All that time it was pretty much up in the air until about a month or so before it was announced.

WiNR: I am very interested in this major organizational change that you are leading in the region. You had been going through reorganizations and changes since 1983, so what kind of change are we talking about here now, and what prompted it?

Rust: I knew one of the problems was a lack of leadership in the region and another was the need to support the field areas technically, to be advocates for the resource. And further, we had to try to muster support for funding and for public support to conserve the resource. My reorganization was driven by a sense of change to resolve issues that were longstanding. They were issues maybe I was even responsible for creating. But even knowing that, you can't allow fragile resources to deteriorate.

WiNR: Did the Vail Conference in 1992 (held at Vail, Colorado) have anything to say to problems you are addressing?

Rust: Yes. The 75th Anniversary of the National Park Service was moving—emotionally and intellectually. It was a great year. I did not see what happened at Vail as a criticism of the Park Service. I saw it as an opportunity like New Year's Eve—taking stock of where you are and pledging to do better. In the 75th year, the Director of the Park Service wanted to put emphasis on what he considered critical areas. One area was the cultural diversity of the Park Service. He wanted to celebrate our cultural diversity. The second thing he did was say that we can't support ourselves by ourselves—the Park Service can't run unless we can understand how to be better partners. He began this theme of partnership and he ran a partnership conference. The third theme was how can we prepare ourselves for the 21st century? How do we need to plan differently? Another theme was, how do we need to conserve differently? What must we do to conserve our resources? How do we go back to the Organic Act of 1916, do what is right, do the right thing in the right way and do it well.



WiNR: If you just take one of the Director's themes, for example the one having to do with cultural diversity within the Park Service, what happened concretely?

Rust: He held a women's conference which brought together women in the Park Service to talk about where they were, skill training, and, importantly, to set up an agenda which was almost a declaration of sentiment. By the way, I worked at the Women's Conference.

WiNR: Does the Vail Conference still have an after life? Did it mean anything?

Rust: Absolutely. I believe in it. It is my catechism. I took part in the planning and was on one of the Task Forces called Organization and Renewal. To critique where the Park Service was going was everyone's job there. It took a pretty brave soldier to allow people from the outside, not just insiders, to come together and critique the organization.

WiNR: What is your role in seeing the Vail agenda come to life?

Rust: Let me give you an example. We know that there are wonderful natural resources in the National Park System. In this particular region we have natural resources in most of our parks, and outstanding ones in Acadia, Cape Cod National Seashore, Gateway National Recreation Area and Fire Island National Seashore. Saratoga National Historical Park is a battlefield, true, but it is also a marvelous natural resource. It is my job now to blend the natural and cultural resources together rather than see them as separated factions. We have to turn around the thinking which says that we have great cultural resources but crummy natural resources—or—let's put all our money in cultural resources because you know we don't have the Yosemite and the Yellowstone. This kind of attitude has to go. The natural

resources of this region are equally as important as our cultural resources and vice versa.

WiNR: What led up to this feeling of conflict and apartness?

Rust: Formerly they were managed separately, separate little islands. Indeed, in this particular region also we separated natural resource management from science. Now I don't want to exaggerate and say they never talked to each other, but there were communications problems, there were obvious efficiency problems. The field couldn't get straight answers, or wouldn't get an answer. The whole black hole theory, you know—you send something in, where does it go? It's changed now so that what was separate is now together and they are together because of what came out of the ideas from Vail—that resources don't exist in isolation. Natural resources don't exist isolated from cultural resources. They fit together. There obviously are different applications in preserving and conserving them, but you have to be able to understand the impact between the two.

WiNR: If you were to predict, do you see the Park Service acquiring a large number of new sites in the near future? If so, what kind?

Rust: Whatever growth there will be will be in tune with the concept of "nationally significant." Concepts change and I believe "nationally significant" will broaden. There will probably be more cultural areas. The concept of "national park area" will change too because the role of the NPS is also changing. The federal government is being perceived as more of a partner and less as the "be all and end all." Cooperative management will surely be the key for future parks. Exciting for all parties involved, I think.

WiNR: I'd like to change the subject, and ask if you think women experience the

equivalent of a so-called glass ceiling in their career development in the Park Service?

Rust: Yes, I do. And so do minorities.

WiNR: Interpreters were often women in the past and they were often undergraded, many think, for what they were doing. If you went into that series and if you did that kind of work you were also stuck. Does that kind of thing still go on?

Rust: Yes, it still goes on. I think the problem is perception of the kinds of things that women should do. Women (and minorities) are generally thought of as good second people. They are always behind a white man. I spent most of my career that way, too. We are like gal-friday. Women may see this relationship as the full mentor one, which is an excellent concept, don't get me wrong, but women think they have to stick to it. Women and minorities don't, I think, move out as they should. I think the glass ceiling comes about because men don't expect them to move out. It is sad for men when they lose the talent. When they think about it, men are willing to give women an opportunity, but it shouldn't be up to men to give women an opportunity. It should be a woman who gives herself her own opportunity. The glass ceiling is done to us, but in a sense is done to ourselves if we don't make ourselves move through it.

WiNR: Do you think better management development programs would help women get through that?

Rust: Yes, I think better management development programs would help—and I would counsel young women to work on the tough side in college and not on the easy side, and not to do what I did. I would counsel them not to major in French and economics

if they really are natural resources career bent. I did what I wanted to do, but if you are going to major in French and then complain about the fact that you can't become a Park Manager, then that is not the Park Service's problem. Now if you majored in natural resource management and can't become a Park Manager, then I want to hear about it.

WiNR: Is the Park Service doing successful career counselling?

Rust: We're doing better, but still not good enough. What has happened is that the new generation coming along is going to be, hopefully, better trained and prepared. The problem for this generation is the generation that is still there, like me and the folks just behind me, who are also waiting to move up. And that is not going to change over time, so what is important is that we try to enhance the careers of the lower grade people even though they may not be able to move up fast. And I also think, and I'll be very straight with you, I think my generation should get out of the way. I'm talking about myself. You've got to come to the point where you move over and let somebody else take over. I do not intend to sit as a queen on a throne. You've got to create an opportunity for somebody else. You can't think you are the only one who can do it. In that regard, the glass ceiling is as much created by women.

WiNR: You describe an all too familiar situation very well. Women struggle so hard and the opportunities are so few that once a woman has made it, what else is there to do but to protect that turf to the death? What would be next for you, career-wise, then?

Rust: I would like to do some of the things I find tantalizing, like running a business, perhaps. I have a whole list of things I want to do. But I also don't want to lose my



connection to the Park Service, so I would like to be an advocate for them from the outside rather than from the inside. You've got one person here who is going to get out of the way and let other people have the turf. I don't have ownership and that is the best contribution I can make.

Interviewer Daina Dravnieks Apple is Assistant Regulatory Officer for the Forest Service, Information Systems and Technology Staff, Washington DC. Her 16-year career in the Forest Service includes serving as Management Analyst for the Regional Engineering Staff, Region 5, San Francisco; Regional Appeals Coordinator in Region 5, San Francisco; Economist at Pacific Southwest Research Station, Berkeley, where she published studies on public involvement in land use planning; designed administrative systems; conducted organizational analyses and developed organizational designs; and conducted strategic workforce planning. Her B.Sc. is in Political Economy of Natural Resources, and her Master's in Geography—both from the University of California Berkeley. She just completed a term as Chair of the Continuing Education Committee of the Society of American Foresters National Capital Chapter; she was President of Phi Beta Kappa for northern California and served as National Secretary.

Photos these pages of Marie Rust: Page 29, with friends, taking a break while hiking the mountains of Acadia National Park in Maine. Rust gathered the heads of environmental groups for a weekend of meetings. Page 30, Rust joins in a construction "groundbreaking" ceremony at Salem Maritime National Historic Site with the city's mayor, its congressman, and Elizabeth Marcus, the acting superintendent of the site. Page 31, (left) Rust leads former NPS Director James Ridenour through the regional office, introducing staff and (upper right) addresses 100 regional employees at the Frederick Law Olmsted National Historic Site. The employees were gathered for an awards ceremony.

Photos courtesy R. Dixie Tourangeau and Edie Shean-Hammond, NPS.



THE "LADIES" CONTINUE THE STEWARDSHIP TRADITION.

THE ADAMS NATIONAL HISTORIC SITE

BARBARA MACKEY

"Remember the Ladies," wrote Abigail Adams to husband John. John Adams, the future second president of the new republic, was, on March 31, 1776, working in Philadelphia, 300 miles from home crafting a new government.

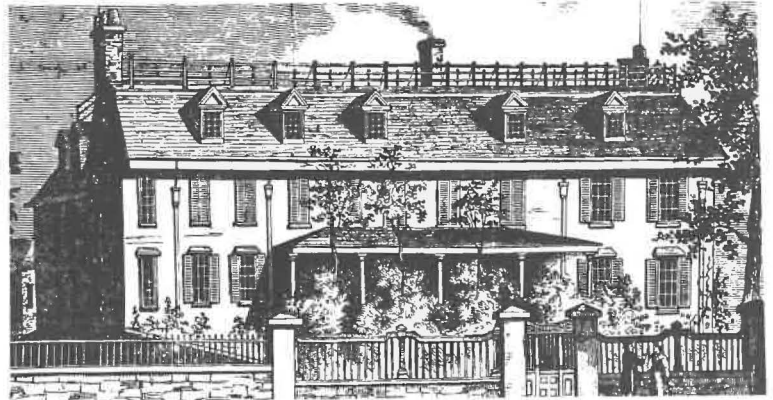
"I long to hear that you have declared an independancy," Abigail writes from their Massachusetts home, "and by the way in the new Code of Laws which I suppose it will be necessary for you to make I desire you would Remember the Ladies, and be more generous and favourable to them than your ancestors. Do not put such unlimited power into the hands of the Husbands. Remember all Men would be tyrants if they could. If perticular care and attention is not paid to the Laidies we are determined to foment a Rebellion, and will not hold ourselves bound by any Laws in which we have no voice, or Representation" (Adams Family Correspondence, L.H. Butterfield, ed., p. 370).

Abigail, as it turned out, did not foment a rebellion when the new government ignored women's rights, but oddly enough, her injunction to give power to women has been realized in the management of one of the nation's most exemplary cultural resources, Adams National Historic Site.

The Adams site

Adams NHS, 10 miles south of Boston, in Quincy, Massachusetts, was established to commemorate President John Adams (1735-1826), President John Quincy Adams (1767-1848), and two succeeding generations, all of whom lived in the "Old House." The Adams family, cognizant always of their history, had taken pains through four generations to preserve the buildings and furnishings, as befitting the national treasures they are. The property was given by the Adams Memorial Society to the United States "to be preserved and maintained as a place of historic and public interest and as an educational exhibit...and with the purpose of fostering civic virtue and patriotism...." (Deed of gift).

Adams NHS today consists of a collection of more than 30,000 historic items and 11 historic structures on two separated parcels totalling 12 acres. Its staff of 20, with an



annual budget of \$900,000, maintains a national resource of enormous historic and cultural value. In 1992, more than 30,000 visitors from this country and abroad came to Adams NHS during its seven-month season.

The park has three major features, the two presidents' birthplaces, the United First Parish Church, and the "Old House." The undisputed jewel of this national historic site is the "Old House." Purchased by John Adams in 1787 as a 56-year-old seven-room house, it was named "Peacefield," but soon was referred to by its current appellation. Additions were made over the years until the house became a 21-room mansion by 1927, when Brooks Adams, the last family occupant, died.

"Unlike Mount Vernon or Monticello, it never passed out of family hands and its furnishings have not had to be sought out or replaced," writes historian L.H. Butterfield. "Its mixture of styles and its agreeable clutter

of furniture, china, rugs, pictures, books, kitchen equipment, and memorabilia, acquired at different times in many places, show the evolution of tastes and manners over nearly a century and a half as nothing else could do. Adams National Historic Site may be compared to an archeologist's 'dig' with all the strata of successive cultures laid bare to enable the student to reconstruct the domestic life of one of the few dynastic families America has produced" (L.H. Butterfield, *Adams*, NPS brochure).

Park rangers guide visitors through the house and describe events illustrated by the furnishings: e.g., "Here is the upstairs study in which John Adams died 50 years to the day after independence was proclaimed—and only hours after the death of his friend, compatriot, and rival, Thomas Jefferson. That was on July 4, 1826."

The two birthplaces, now more than 300 years old, are sparsely furnished, largely

The North Atlantic Region of the National Park Service

Barbara Mackey

Not only does Adams National Historic Site exemplify management by women in the Region; it also typifies NPS sites in the North Atlantic Region. Of 42 NPS units in the region, 37 are primarily historic (national historic sites, national historical parks, national monuments or memorials) and 24 are located in urban environments. The region, with headquarters in Boston, includes the six New England states plus New York and New Jersey. Many urban parks have been created with significant parcels of land outside federal ownership, making partnerships imperative.

The North Atlantic Region has approximately 1,800 employees, of which 36 percent are women. Nearly 30 percent of supervisors are women, and nine of the 19 division chiefs or managers in the regional office are women.

The North Atlantic Region is distinguished in having Marie Rust, the highest ranking woman in the National Park Service, as its regional director.

Rust, who has held many management positions with the Park Service, in the Region, has been a strong proponent for women managers.

What does the presence of increasing numbers of women in decision-making positions mean for management? Is it a matter of style, tone, emphasis? Sarah Peskin, chief of planning for the NPS North Atlantic Region, thinks not only are there increasing numbers and influence of women managers, but there is also a style of management that has become evident. "It's characterized by consensus building, active listening, being open to a variety of options, giving credit to others, and working as a team," she says. "Some men also operate with this approach, but it seems more characteristic of women. It has become one of the hallmarks of our region. As I travel around the country it's clear that our region is a standout in this approach to management."

with reproductions. They stand on a small triangle of land surrounded by streets, residences, and commercial buildings, two miles from the "Old House."

"The Church of the Presidents," as the United First Parish Church is known, remains an active religious institution under the ownership of its congregation. It contains the crypt of both presidents and their wives. The building, constructed of Quincy granite, was designated a national historic landmark in 1970. Designed by Alexander Parris, it is an outstanding example of Greek Revival architecture.

In an example of cooperative park partnerships, the church and the Adams Temple and School Fund, owner of the crypt, this season will be welcoming park rangers from Adams NHS who will provide regularly scheduled interpretive tours through this magnificent structure in downtown Quincy.

The stewardship of the Adams women

Throughout its history, this Adams property has been at least under the influence of women if not under their outright stewardship. For the first two generations, the husbands were away from home for long periods as public officials and diplomats, leaving "Peacefield" in the care of their wives.

Abigail was a true steward. She managed the household, the farm, and the family for the better part of 12 years while John was vice-president and president. Her presence persists in tangible ways such as in the garden where every spring, visitors are treated to the blooms of Abigail's lilacs and white York rose, which she planted in 1788 on her return from England. Little could she have known that this legacy, along with legacies less tangible, would be vibrant still, more than two centuries later.

The Adams Family Correspondence reveals her concern: "I hope in time to have the Reputation of being as good a Farmeress as my partner has of being a good Statesman," Abigail Adams wrote to John in 1776 (p. 370). Historian L.H. Butterfield believed she was successful: "It fell to Abigail...to manage the farm and supply the deficiencies of the homestead. This she did with vigor, proceeding first to make the most necessary repairs in the house and then enlarging the 'farm building'.....Much of this was done without her husband's knowledge, some of it in fact to surprise him.....And it is probable that the family stayed solvent largely through her resourceful management during trying times" (NPS brochure).

From another perspective, perhaps Abigail Adams did foment a revolution, a long, slow, uncatclysmic revolution that has brought women out front as managers rather than keeping them stowed behind the scenes where they have nonetheless often moulded history. Abigail Adams in her time could not





have been superintendent of a property like a National Historic Site, but her spiritual descendants Wilhelmina Harris and Marianne Peak could, and have been. Abigail was like a superintendent, for she operated the farm, preserved it, protected it, and assured that it would be available for future generations. Her husband's letter of May 15, 1777 suggests just that: "Gen. Warren writes me that my Farm never looked better, than when he last saw it, and that [you were] like to outshine all the Farmers—I wish I could see it" (Adams Family Correspondence, p. 238).

Abigail's daughter-in-law, Louisa Catherine, held lesser interest in the property. But she did assume some caretaking responsibilities during her husband's absence although she joined her husband, John Quincy Adams, at his diplomatic posts abroad for many years.

By mid 19th century, the resident Adamses were Charles Francis and Abigail Brooks Adams. They set about converting "Peacefield" from a working farm to a country estate, building a presidential library and a carriage house complex. Abigail Brooks Adams, more than any other family member, was responsible for the gardens that today attract strollers to the grounds year round.

Women managers are traditional at Adams National Historic Site

Since its establishment as a unit of the National Park System in 1946, Adams National Historic Site has not only "remembered the ladies" but has been managed by "ladies." Few properties in the National Park system can claim the continuity of management one finds at Adams NHS.

During the final years of the fourth generation, Brooks Adams hired Wilhelmina Sellers Harris as his secretary. She became a loyal associate of the family, and when the Adams family donated the site to the Park Service 19 years after Brooks' death, it was Harris who was chosen to be its first superintendent in 1947. During her tenure, she hired 17-year old Marianne Peak as clerk/secretary. When Harris retired at age 91, she was succeeded by Peake, her reliable assistant and protege, in 1987. Currently, three of the park's four division chiefs are women: Caroline Keinath (interpretation), Judith Curtis (curatorial resources), and Peg Maginnis (administration).

During her 40 years as superintendent, Harris catalogued a large part of the collection and wrote a small volume on the Adams family's legacy, its porcelain collection acquired during world travels, and the trademark gardens. She succeeded in retaining the family's tone of management even while administering within a federal bureaucracy. Her practice of serving coffee in china cups rather than in paper or styrofoam containers continues today at special events.

Under Peak's leadership, the park in the last five years has been looking toward the 21st century. A general management plan has been started (coincidentally also under the direction of a woman, Jackie Powell, from the Denver Service Center of the Park Service), and many partnerships have been nurtured with the city of Quincy and with business, educational, and public service organizations. Superintendent Peak stays in close touch with the Adams family, which continues its involvement still through the Adams Memorial Society and Adams Ladies Committee.

As we enter the 21st century, it is no small task for a park with fragile resources and growing public attention in an urban area to carry out the dual mandate of the National Park Service: "to conserve the scenery and natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (NPS Act, 1916). Abigail's example of stewardship, however, is a fine example to follow.

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Barbara Mackey is a park planner and legislative specialist with the North Atlantic Region of the National Park Service. She is the planning liaison to Adams National Historic Site. She started with the Park Service two years ago, having worked for three years with a regional land trust and watershed organization. Her previous experience includes teaching, journalism, and marketing architectural services. Mackey has a Master's from the Conway School of Landscape Design, Conway, Massachusetts.

Photos these pages: Drawing of the "Old House" at mid-19th Century; Interiors of the stone library and interior of the Memorial Room, "Old House." Superintendent Peak (in uniform) and author Barbara Mackey are standing in front of the "Old House" (1993). Photos and drawing courtesy NPS.

GOING AFTER THE RESEARCH DATA TO SUPPORT CLAIMS OF ADVERSE IMPACTS IS THE NEW TACK THIS PARK IS TAKING. IN THE MEANTIME, THERE ARE IMPROVEMENTS: MORE POLLUTERS ARE POLLUTING LESS.

AIR QUALITY AT SHENANDOAH NATIONAL PARK

JULIE THOMAS

Shenandoah National Park is one of 48 NPS class I areas, as designated by the Clean Air Act. Vegetation, visibility, water quality, wildlife, ecological systems, historic and prehistoric structures and objects, and most other elements of a park environment are sensitive to air pollution and are referred to as "air quality related values," or AQRVs.

Shenandoah National Park has four major concerns about air pollution and its impacts to park resources:

Visibility. Annual average visibility has declined 60 percent between 1948 and 1983, with—in summer—an 80 percent decrease and a 40 percent decrease in winter months (NAPAP, 1990. Airport visibility data).

Aquatics. Many streams in the park are moderately to extremely sensitive to acidification caused by atmospheric pollutants; streamwater acidification is causing adverse effects on aquatic fauna.

Vegetation. Ozone (a secondary pollutant caused by reactions between nitrogen oxides and volatile organic compounds) is causing visible injury to sensitive vegetation.

Human Health. Ozone levels in Shenandoah are frequently above 80 parts per billion, a level which the American Lung Association says is high enough to cause adverse effects in many people.

Sources of man-made or anthropogenic air pollution include stationary industrial sources and mobile sources, both local and regional.

History of air quality management

Air quality monitoring began in Shenandoah National Park in 1978. Data is collected at three sites in the park. Concentrations of sulfur dioxide (SO₂) and ozone (O₃) are monitored, as well as particulate amounts and deposition, visibility impairment and meteorological data.

The amount of air pollution being generated in Virginia has steadily increased during the past ten years. Exceptionally fast growth in northern Virginia, coupled with an increasing use of coal to fire new power plants, threatens to more than double the amount of air pollution that was emitted in 1985. Although automobiles have become more fuel-efficient in recent years, the combined effects of population growth in Virginia and increased vehicle use have increased pollution from mobile sources.

Although air pollution can travel long distances, local sources

of pollution become important during periods of air stagnation or inversion. During these periods, local emissions cause the greatest impact because they are less able to disperse. This region has one of the highest occurrences of inversion days in the country. The Shenandoah Valley is especially sensitive to periods of air stagnation.

Many people regard the federal standards for air pollution to be the same as a speed limit on the highway. If the speed limit is 45 mph, you had better be going AT LEAST that fast or you'll get run over. Air quality limits are different. As pollutant concentrations get closer to the federal ozone standard, spots appear on leaves of sensitive vegetation, and, as levels get closer to the standard, more and more people begin to have trouble breathing, headaches, dizziness, and other symptoms. Federal air pollution standards are to be AVOIDED, not aimed for.

As required by the provisions of the Clean Air Act, park staff with the NPS Air Quality Division (AQD) have reviewed permit applications from major new air pollution sources and assessed potential impacts of these pollutants on the park. Whenever it was determined that a new source might cause or contribute to an adverse impact on AQRVs, the staff has recommended to the permitting authority (in Virginia, the Virginia Department of Air Pollution Control, or VDAPC) that the air pollution permit be modified to eliminate adverse impacts. Specific recommendations have included reduction in emissions, offsetting emissions to offset impacts to resources in the park, and assessing cumulative pollution impacts from surrounding sources.

In a letter dated May 24, 1990, the superintendent asked the Virginia Secretary of Natural Resources for a moratorium "on all permits not yet approved by the Virginia Department of Air Pollution Control for the construction of electrical generating facilities capable of emitting greater than 500 tons per year of either SO₂ or NO_x, until the cumulative effects of the proposed emissions can be assessed." He also asked that energy needs and planning be done to make the most efficient use of the energy Virginia was currently producing.

Although this letter produced much discussion, no moratorium was set, and in September 1990, the NPS issued a notice for public comment in the *Federal Register*. This notice was a preliminary declaration of adverse impact to Shenandoah National Park. Substantial comment was received, most in favor of NPS efforts to protect the park's air.

Since the *Federal Register* notice, the NPS Federal Land Manager (FLM) has been negotiating each Prevention of Significant Deterioration (PSD) permit on a case-by-case basis. In each case, the FLM has asked for the use of Best Available Control

Technology (BACT) and offsetting new emissions by reducing existing emissions to mitigate potential impacts to the park's resources.

Although no permit has been denied on the basis of the Shenandoah adverse impact declaration, the permitted amounts of pollutants allowed has been substantially reduced from the initial proposals. In some cases, emission offsets were obtained.

Management objectives

The objective of air quality management in Shenandoah National Park has three parts: 1) to reduce any existing man-made pollution affecting the park, 2) prevent any future pollution from adversely affecting the park, and 3) inform and educate the public about the importance of clean air as an essential resource that is critical for the survival of everyone.

Status

As part of our effort in the park to inform the visiting public about air quality, visibility and ozone levels were posted at all entrances to Shenandoah again in 1992, from May through mid-October. Season-long ozone readings were: 42 percent of the days had low ozone, 56 percent days were moderate, and 2 percent of the days had high readings (reaching the federal standard) for 1992. For comparison, 1991 had more days of high readings (13 percent) and fewer days of moderate readings (44 percent). Since ozone formation depends on hot, sunny days, and last summer was wet and cool, we think that ozone levels were lower in 1992 because of the weather, not because there was less pollution in the air.

The visibility data would seem to prove that the air is NOT getting cleaner: Poor visibility days, less than 10 miles, occurred 47 percent of the time (but one-third of that 47 percent was due to foggy conditions). Average visibility days, where a person could see between 10 and 29 miles, occurred 36 percent of the time. Good days, greater than 30 miles, happened 17 percent of the time. These results are slightly worse than 1991's visibility readings, which, at 80 percent worse than the 1940s, were some of the worst in any national park in the country (NAPAP, 1990).

Just knowing this much about the air in Shenandoah is enough to lead one into concluding that the park has an air pollution problem. However, every time we are called to defend our position of protecting the air as the Organic Act and the Clean Air Act direct us to do, we are asked for "proof." Congress, industry, and state and federal regulators want cold, hard, numbers that will quantify the resources that will die or be directly adversely affected by air pollution. We have several years of ozone and sulfur dioxide data from the park, and about 11 years of water quality data from the streams. What we don't have is the link between pollutant levels, stream acidity, and effects on resources.

Research to connect the links

To this end, Shenandoah National Park staff have begun research projects to develop these needed facts for defense of the resources. The Air Quality Division of the National Park Service is funding a study to document the occurrence and severity of ozone injury on sensitive hardwood species in Shenandoah National Park. Its purpose is to relate ozone levels that we monitor to tree damage from ozone. That is, we want to be able to say, "This much ozone causes this much damage to a tree."

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Researchers from Penn State check black cherry, yellow poplar, and white ash trees located near each of the park's ozone monitoring stations during the summer growing season. Thirty trees from each species are tagged at each monitoring station. Researchers document leaf damage and how much of it there is on each tree. Preliminary results show that ozone injury appeared on from 10 to 80 percent of the leaves of the trees (all three species), but correlation with monitored ozone levels hasn't been calculated yet. This summer (1993) will finish out the data collection for this study and a final report is due by early 1994.

A second study, funded by NPS Washington office (three years only), is going to give NPS information that will predict not only what acid rain will do to the streams but what happens to the fish in them. Summer of 1992 was the first field season, and work was done on Piney River, Paine Run, and Staunton River. Researchers from University of Virginia and Virginia Tech are cooperating on the study. Results from this year suggest (as previously suspected) that episodes of rainfall at critical times of the year may do as much damage to fish as overall, average levels of acidity. Final results won't come out until the study ends in late 1995.

Conclusion

So where is all this getting the National Park Service? The requests for air permits from industry keep coming, and they keep receiving air pollution permits from the state. Well, it's better than it looks. One example is the Multitrade permit. Because of our efforts, Multitrade decreased its sulfur dioxide emissions from 623 tons per year to 78 tons. In fact, every permit that has been processed since October 1990 has been significantly cleaner than originally proposed. The increase of pollution is slowing.

The park is still pursuing avenues for pollution reduction like regional, multistate air quality managing efforts and emissions reduction and offset strategies. And the message is getting out: Industries have begun to plan for the BEST control technologies without prodding from us; they're thinking in a more environmentally sound manner. Solutions to Shenandoah's air pollution problems will require comprehensive, cooperative measures by all contributors to the problem, whether large or small. There is a lot of room for improvement in the air quality for Shenandoah National Park, but we are making progress.

Since 1991, Julie Thomas has been Air Quality Program manager for Shenandoah NP. She began her career in 1979 doing strip mine reclamation/wildlife recovery studies for TVA. She has taught school (physics and chemistry) and then worked at Great Smoky Mountains as an environmental educator and as a biotechnician. She then transferred to the Department of Defense as a biotechnician (Fort Bragg) to work on endangered species. Prior to her current assignment she was resource management specialist at the southeast regional office: Resource Management Plans, Integrated Pest Management coordinator, Air Quality Coordinator, Abandoned Mines (part of minerals management). Her Bachelor's in Wildlife and Fisheries Science is from the University of Tennessee. Her Master's in Secondary Science Education is from the University of Chapel Hill, South Carolina.

This book, written by feminist author and activist Gloria Steinem, explores several concepts of self-esteem as expressed by working women. She uses, in addition, personal stories to illustrate those concepts and presents practical exercises for the reader to discover—or increase—his or her own self-esteem. Each chapter, designed to stand alone, is subdivided into a section examining the cultural background, a section using personal stories (some anonymous and some clearly identified), and a section with exercises for the reader to explore.

Much to my surprise, I thoroughly enjoyed this book. I was surprised because I had decided—without reading anything by Steinem—that her writing would be dry, intellectual and without any personal revelation. But it isn't, and in addition, has much to recommend it for both men and women. Steinem writes: "Right away, this book had a mind of its own. It decided it had to be for men, too. The more I talked to men as well as women, the more it seemed that inner feelings of incompleteness, emptiness, self-doubt, and self-hatred were the same, no matter who experiences them, and even if they were expressed in culturally opposite ways."

I read a lot. However, I notice I tend to read natural history, "how-to," or even (gulp!) science fiction rather than analyses of current social situations. I guess I want to be entertained or I want to learn to do something or I want to discover a new skill. This book offers none of those things, so I warily approached it. I learned some new things in the "analysis" part and gained new exercises to do.

Never really defining "self-esteem," the book none-the-less is about expressions of self-esteem. She writes: "I began to understand that self-esteem isn't everything; it's just that there's nothing without it." Noting that the concept of self-esteem is neither new nor frivolous, that it is as old as humanity itself, she goes on to say: "It seems that the older the teaching, the more it presents self-wisdom and self-honor as a source of strength, rebellion, and a kind of meta-democracy—a oneness with all living things and with the universe itself. Returning to this concept of circularity and oneness that preceded patriarchy, racism, class systems, and other hierarchies that ration self-esteem—and that create obedience to external authority by weakening belief in our natural and internal wisdom—is truly a revolution from within."

Steinem confesses in A Personal Preface her own lack of self-esteem when she reports the observation of a friend and colleague that the original draft had no "author's voice." She writes: "In the months that followed, I gave up those elaborate and intellectualized pages, but it took much longer for me to give up my image of myself as someone who helped other people through crises and never had any of my own."

As a case study, she presents California's Task Force to Promote Self-Esteem. Noting there was a popular misconception about the task force (do you remember Gary Trudeau's comic strips about it?) she believed the media ridiculed

Gloria Steinem
Revolution From Within:
A Book of Self-Esteem

Little, Brown and Company 1992

Reviewed by Jonne Hower

government interest in self-esteem and did not report an accurate picture. Apparently, more people applied to serve on this Task Force, in spite of its heavy part-time work with no pay, than on any other committee in California's history. Developing model programs and policies, the total cost of the Task Force was less than the cost of keeping one 20-year-old in prison for a life sentence. And, she reports, the program benefitted all of society. In one high school which undertook to explain the connection between self-esteem and unwanted pregnancy, the number of such pregnancies fell over a three year period from 147 to 20. In a mostly Hispanic school district, student discipline problems fell by 75 percent after self-esteem became a subject of discussion.

There are some wake-up calls here for educated women. At several points in the book she contrasts the responses, as a group, of the now-grown women from her childhood working class neighborhood with the responses, as a group, of her fellow graduates from an elite ivy-league women's college. The women of her working class neighborhood had organized themselves to demand equal pay for equal work, begun their own businesses, run political campaigns, and organized battered women shelters. On the other hand, her college classmates were agonizing about carrying a banner which disagreed with U.S. policy in South America. They were wondering if it was polite to disagree.

Steinem asks if there is something about more education which leads women to have lower self-esteem. She cites a 10-year study which follows 80 high school valedictorians—both men and women—from different economic and racial backgrounds. In high school, 23 percent of the males and 21 percent of the females described themselves as far above average. At college graduation, the percentage had risen for males to 25. However, no female rated herself as far above average. Remember, these were the brightest students, the valedictorians, and there were more women than men in the group.

After exploring the concept of self-esteem and some of the results (e.g., crime-free neighborhoods, declining drug problems) for society if it can teach itself the value of high self esteem,

Steinem suggest un-learning what "everyone knows" and re-learning what each individual knows within him/herself. As an example of "what everyone knew" is the 1800s science of "craniology." This elaborate system correlated cranial size with intelligence and "proved" men were smarter than women because they had larger heads.

In other passages, using several vignettes, Steinem presents a variety of methods the reader can use to re-discover his or her own inner authority. She writes: "Each of us has an inner compass that helps us know where to go and what to do. Its signals are interest, excitement, the joy of understanding for its own sake, and the sort of fear that is a sign of being in new territory—and therefore of growth."

I found the final chapter confusing and murky. In it Steinem seeks to tie self-esteem with religion, spirituality, and "reconnecting with nature in an immediate and sensual way." The last section of this chapter contains a list of abilities demonstrated by individuals who suffer from multiple personality disorder. What she wanted us to conclude from this list is still unclear.

The book ends with a guide the reader can use to discover some of the thoughts, beliefs, and experiences lodged in his or her own mind, and following this, there is a lengthy, annotated bibliography. Echoing the themes of the entire book, the bibliography includes books about the inner life and the outer life. The author notes that she included them both to "provide literal help with self-therapy [while] others contains facts and authoritative opinions we may need to stand up for what we think and feel."

As I was finishing the writing of this review, I discovered (or more precisely, one of my male friends—to whom I had recommended this book—discovered) the paperback edition containing a new 40-page chapter titled "One Year Later." She writes of the media's attention to her personal stories at the expense of observing the book's "inclusiveness across lines of sex and race, class, sexuality, and ability; [no review] mentioned its linking of the social justice and self-realization movements; and no examination, pro or con, of self-esteem as a practical source of revolution." She concludes the new section with a "do-it-yourself" recipe for starting small groups to explore the concept of self esteem. She writes "we have come into a time of polarization, with self-explorers refusing to vote and activists refusing to restore themselves." Calling them a "full-circle group" she presents guidelines for the groups and subjects for discussion.

And my male friend? Although he admits he hasn't read the entire book, he did note she had a well-researched, interesting, and thoughtful book, but her research and analysis was followed by "typical feminist rhetoric." If you can sort your way through both, this book provides the basis for deep and satisfying conversation and the beginnings of change. I missed reading Steinem the first revolution, but this was worth waiting for.

Jonne Hower is a WiNR Editor

SOME VERY INTERESTING INFORMATION CAME OUT OF THIS STUDY. FOR EXAMPLE, NPS PROGRAMS WITH FEWER THAN 10 SCIENTIFIC POSITIONS HAD NO WOMEN. AFTER AN ADEQUATE SIZE IS REACHED, ONE WOMAN WILL BE HIRED FOR EVERY 4.78 POSITIONS.

NPS SCIENCE AND RESOURCES MANAGEMENT: BLUE SKIES OR GLASS CEILINGS?

SUSAN P. BRATTON

Federal land management agencies have provided cheery reports and data of progressive Equal Opportunity Programs, yet nagging questions remain about what is really meant by the data. The purpose of this paper is to investigate whether U.S. National Park Service (NPS) hiring of women in scientific and resources management positions really reflects the availability of qualified women, and whether women are climbing the professional ladders once they are hired. This paper will also survey staffing patterns in individual National Park Service regions and attempt to determine, if "bottle necks" or ceilings for women can be detected—either by level of responsibility, by geographic area, or by academic field.

During the last two decades, the percentage of graduate degrees awarded to women in the sciences has increased dramatically. In 1970, women earned only 14 percent of the Ph.D. degrees in the *biological sciences*. By 1980, this figure had risen to 26 percent, and by 1987-88, women earned 35 percent of all Ph.D.s awarded in the life sciences. In 1970, women earned only 7 percent of the Ph.D.s in the *physical sciences*. By 1980 this had risen to 15 percent, and by 1987-88 to 18 percent of all Ph.D.s granted.

In 1988, women received 50 percent of the bachelors degrees and 49 percent of the masters degrees in the *life sciences*; 59 percent of the bachelors degrees and 56 percent of the masters degrees in *parks and recreation*, 31 percent of the bachelors degrees and 30 percent of the masters degrees in *agriculture and natural resources*; and 30 percent of the bachelors degrees and 24 percent of the masters degrees in *physical sciences and science technologies*.

38 WOMEN IN NATURAL RESOURCES

Results

In terms of over-all percentages of women in different types of positions there were strong differences between research related and scientific professional positions. Seven of 99 people (7.1 percent) classified as researchers or research administrators were female, whereas twenty-nine of 143 people (20.3 percent) classified as scientific professionals were female. (Table 1) One female researcher was known to be missing from the directory, but her inclusion would have only raised the figures by about 1 percent.

Table 1: Totals for types of position by gender.

| Type of position | No. Female | No. male | Percent female |
|--|------------|----------|----------------|
| Research | 7 | 92 | 7.1 |
| Science -technical | 29 | 114 | 20.3 |
| Resources management specialist | 36 | 134 | 21.2 |
| Chief - resources management | 5 | 55 | 8.3 |
| Park ranger | 15 | 67 | 18.3 |
| Technicians, aids, workers | 15 | 36 | 29.4 |
| Information, administrative support | 12 | 10 | 54.5 |
| Consultants | 1 | 10 | 9.1 |
| ----- | | | |
| Administrative | | | |
| Science administration | 0 | 18 | 0.0 |
| Technical administration | 3 | 17 | 15.0 |
| Resources administration | 1 | 8 | 11.1 |
| ----- | | | |
| Field | | | |
| Biological research | 6 | 68 | 8.1 |
| Physical science research | 1 | 11 | 8.3 |
| Social science | 0 | 7 | 0.0 |
| All life sciences | 21 | 120 | 14.9 |
| All physical sciences | 11 | 66 | 14.3 |
| ----- | | | |
| Totals | | | |
| Science | 36 | 206 | 14.9 |
| Resources management | 56 | 256 | 17.9 |
| Support | 27 | 46 | 40.0 |
| Administrative | 4 | 43 | 8.5 |
| Administrative with chiefs of resources management | 9 | 98 | 9.1 |

The percentages in resources management positions were similar to the scientific professional positions, with the exception of positions with supervisory titles where women were a lower 8.3 percent. As might be expected, there was a higher percentage of women in support positions with 54.5 percent in information and analyst positions and 29.4 percent in technician positions. Only one scientific consultant was female. The total proportion of women in all science positions was 14.9 percent and in all resources management positions was 17.9 percent.

One of the surprises of the analysis was the relatively equal representation of women in the physical and biological sciences.

Women were 8.1 percent of the biologists involved in research and 8.3 percent of the physical scientists. There were no women in social science positions. Women were 22.4 percent of the scientific professionals with biological titles and 24.7 percent of the professionals with physical science titles (note that some of the administrators were not classified into physical or biological science, and since most of these were men, it raises the percentage of women slightly in these categories.) The overall totals of women in scientific positions were 14.9 percent in biological sciences, 14.3 percent in physical sciences and 0 percent in social sciences. In administrative positions, there were no women in scientific research administration out of 18 positions, 15.0 percent in scientific professional administration and 11.1 percent in resources management administration at the upper levels. The overall proportion of women in administrative positions including the resources management chiefs in category 4, was 9.1 percent.

Superficially there did appear to be differences between regions in terms of the percentage of women occupying scientific and resources management positions, but these results must be analyzed carefully. First, the Washington Office (WASO) had a much higher percentage of women, 32.7 percent, than the next highest administrative unit, Southeast Region, with 19.6. (Table 2) When the data for WASO were broken down, however, there were no women in research or research administration, and 19.7 percent overall in scientific positions. The latter figure is similar to North Atlantic region with 20 percent and Southeast Region with 18.6 percent. WASO had a relatively high proportion of women in resource specialist positions, and also had a high percentage of women in information and administrative support positions.

Figure 1 show the number of women versus the number of positions in all scientific positions. Two things are striking about this graph. One is that programs with less than ten positions usually have no women, and once the program reaches adequate size, one woman will be hired for every 4.78 positions, or a ratio of about 1:5. The second striking thing about the graph is the high r^2 of the curve, .934. Most of the remaining variance in the curve is accounted for by the fact that one must hire a whole and not a fractional woman. This means that the number of women in science positions is controlled almost entirely by program size.

A "critical mass" of 10 men and a ratio of 1.5 also applies when only research scientists are considered. In research, the programs with ten or fewer employees had one woman (1:40 or 2.5 percent) while those with more than 10 employees had six women in 55 positions or 10.9 percent. (One can not perform a Chi-square test on these data, because the number of women is too small.) If one adds research to other scientific positions, we find that programs with 10 or fewer positions have 3 women to 76 men or 3.8 percent

Methods

In 1988, the NPS assembled a Personnel Directory: Natural Resources 1988. The directory, published in September of that year, included "the names, addresses, and phone numbers and formal and collateral-duty titles and areas of expertise for National Park Service Natural Resources personnel" in all ten regions and the Washington Office (WASO). In 1990, I utilized this directory as a listing (potentially with omissions) of all relevant personnel and their geographic locations as of 1988. The directory was not prepared as an Equal Opportunity report, therefore it offered the advantage of being a list of perceived participants in natural science and resources management activities, rather than document consolidated to prove the NPS had adequate numbers of women in these programs. The latter type of list could potentially be "padded" with extra names of people with marginal involvement in relevant programs.

Going through the directory I coded each person listed by region, type of position, and gender. Gender was determined by first name, and where there was a possibility of confusion (names such as Lynn, Lou and Chris) the park or the person themselves was telephoned to determine the appropriate code. This method may still result in some errors, but miscodings should be less than one percent.

Positions were categorized as follows:

1) Scientific research, including everyone in research grade or research grants grade, all regional chief scientists, and everyone with the epithets "research" or "science" in her or his title

2) Scientific professionals, including everyone not included in the research category with a title indicating specific technical expertise, such as "ecologist" or "mining engineer";

3) Resources management or environmental specialist positions, and all other specialist positions with management in the title, ie. "management biologist";

4) Head of a resources management program, including titles such as "chief - resource management - park" or "supervisory ranger - resource management";

5) Park ranger or "park ranger - resources management";

6) Technicians, aids and workers, and all field and laboratory support staff;

7) All staff involved in information management (other than GIS systems which were included in category 2 or 6) or in analyst or administrative support positions; and

8) All consultants who worked for another agency or for a university and were not NPS employees.

Note that categorization by title does not always fully define job responsibilities. For example, some people doing research, at least part time, have positions in category 2, scientific professionals. Categories 1 and 2 are together considered "scientific positions"; categories 3, 4, and 5 are considered "resources management positions", and categories 6 and 7 are considered "support positions".

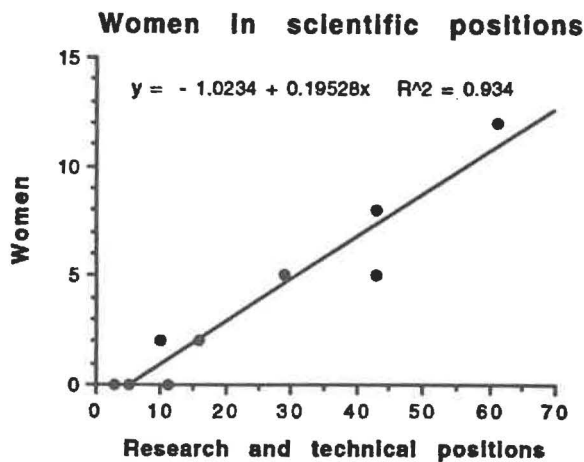
Individuals were also classified as to whether or not they held an administrative position at the regional or national level. NPS Cooperative Park Studies Unit (CPSU) leaders were not included as administrators (this author was the only female CPSU leader at the time), but heads of large research or consulting operations with administrative or supervisory titles were.

Individuals in the research and scientific professional categories were also classified as physical, biological or social scientists. Oceanographers, soil scientists, hydrologists, and experts in geographic information systems were all classed as physical scientists although some of them may have substantial backgrounds in biological fields. Data were analyzed by SAS statistical programs on an IBM XT and Cricket Graph on a Macintosh SE microcomputer.

while the programs with more than 10 employees had 36 women to 224 men or 13.8 percent.

The regressions for the resources management positions indicate a slightly different pattern. They suggest that all regions, including those with few women have included a few women on their resources management staffs, but as the programs increase in size, women are added at a ratio of 1:7 (These

figures exclude WASO, which is anomalous in regard to these positions.) The pattern found in the scientific positions is reversed, the smaller regions have a higher percentage of woman on their staffs than the larger ones. (Table 2) This may be a result of the resources management trainee program which emphasized Equal Opportunity, and thus encouraged each region to hire a few women and minorities in resources management. Unfortunately, the larger regions have not proportionately hired women once they



had their necessary three to eight. It should be noted these positions are almost entirely filled by bachelors and masters level staff, so the *availability* of qualified women, depending on the distribution between biological and physical sciences, is generally between 40 and 50 percent or 1:2 or 1:2.50 (women to positions).

Figure 2 shows the combined staffing pattern for women with all types of positions, except consultants. (This curve excludes WASO.) The curve indicates that overall in resources management and science there is almost no difference from region to region in the number of women

percentage has steadily increased? The argument that the NPS hired most of the researchers when there were fewer women available would appear to be invalid. In actuality, most research positions have been hired during the 1970s and 80s in the midst of a period of increasing availability of women. It is also important to recognize that a majority of research scientists in the NPS are biologists of some type. The almost equal proportions of female biological and physical scientists further suggest that hiring has been less than availability, particularly for the female life scientists who should outnumber the physical scientists 2:1 or even

hired. The average percent of women hired is 17 percent, and the ceiling is about 20 percent.

Discussion

The results of this study, indicate first, that there are far fewer female scientists and resources managers in NPS than one would expect, based on availability. Why only 7 to 8 percent women in research positions in 1988, when there were 14 percent women available at the Ph.D. level in life sciences in 1970, and the per-

3:1. Any social hiring "ceiling" based primarily on program size will discriminate more heavily against women in the scientific fields woman favor—thus there may be greater discrimination against women in botany, ecology and non-game wildlife biology than in hydrology or engineering.

The data imply critical mass in staffing and small program size may be part of the problem. Managers of small programs may not feel obligated to pursue Equal Opportunity hiring, or small groups of white males working together, may be reticent to accept women or minorities until the group is adequately large to ensure women and minorities remain in the minority.

If many small programs do not hire women and minorities, it can create a problem on the national level. The fact, for example, that there were no women in social sciences is interesting because women received 19 percent of the social science Ph.D.s in 1970 and 38 percent by 1980. The dearth of women in social sciences may also be related to small program size. The data suggest there is a ceiling (barrier) of roughly 20 percent for women in non-support positions. The lack of women in supervisory positions also suggests there may be an unwillingness to hire women in the relatively high graded research jobs as opposed to somewhat lower graded (on the average) technical science and resources management positions. In 1988, 18 research related positions were classed as administrative, yet none were filled by women. Women in science thus have to deal with at least two levels of restricted entry: first, they have a low probability of getting a science job, and once they have it, they have an even lower probability of advancing to a scientific administrative position.

One might try to excuse these statistics by suggesting that many NPS positions are field positions in remote areas and women do not want them. Present staffing patterns make this an unlikely explanation. In the 1988 sample, all the women in research science began their careers in field locations, with two exceptions. Women have done quite well in the parks and to this author's knowledge, NPS has never had a female permanent scientist leave because of rough field research conditions. It also seems unfair to use the outdoor elements of NPS research as an excuse for not hiring women, when women are also under-represented in higher graded regional office and WASO jobs, and many of the men in NPS science

Women in all positions by program size

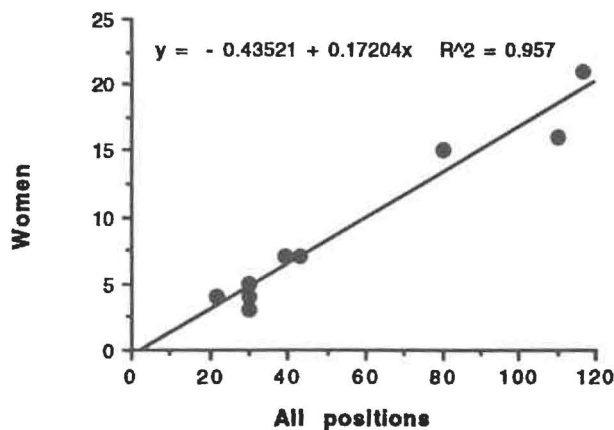


Table 2: Numbers of women by type of position and region

| Region | Ratio of females to males and percent female | | | | | | | |
|------------------------------|--|------|---------|------|----------------------|------|-------|------|
| | Research | | Science | | Resources Management | | Total | |
| | F/M | % | F/M | % | F/M | % | F/M | % |
| By total program size | | | | | | | | |
| National Capitol | 0/5 | 0.0 | 0/5 | 0.0 | 4/13 | 23.5 | 4/18 | 18.2 |
| North Atlantic | 1/7 | 12.5 | 2/8 | 20.0 | 3/17 | 15.0 | 5/25 | 16.7 |
| Southwest | 0/1 | 0.0 | 0/5 | 0.0 | 5/20 | 20.0 | 5/25 | 16.7 |
| Mid-Atlantic | 0/2 | 0.0 | 0/3 | 0.0 | 4/22 | 15.4 | 4/26 | 13.3 |
| Midwest | 0/7 | 0.0 | 0/11 | 0.0 | 3/16 | 15.8 | 3/27 | 10.0 |
| Pacific NW | 0/10 | 0.0 | 2/14 | 12.5 | 4/16 | 20.0 | 7/32 | 17.9 |
| Alaska | 0/4 | 0.0 | 2/14 | 12.5 | 5/17 | 22.7 | 7/34 | 16.3 |
| Rocky Mtn | 3/17 | 15.0 | 5/24 | 17.2 | 5/36 | 11.6 | 15/65 | 18.8 |
| WASO | 0/8 | 0.0 | 12/49 | 19.7 | 8/12 | 40.0 | 32/66 | 32.7 |
| Western | 1/19 | 5.0 | 5/38 | 11.6 | 7/43 | 14.0 | 16/94 | 14.5 |
| Southeast | 2/12 | 14.3 | 8/35 | 18.6 | 8/44 | 15.4 | 21/96 | 19.6 |

and resources management in the more urban regional office, WASO, and Cooperative Studies Unit positions have never served in a park.

Although the WASO program have proportionately more women, one can not credit the Washington Office with setting a good example, without being certain the better ratio is not an artifact of grade and supervisory structure. WASO has proportionately more high graded positions (GS-11 and higher) than the regions and also employs more support staff. Since many of the women in WASO are in resource management specialist positions and in information and administrative support positions, these women may not be perceived as competing strongly with men in the high-graded WASO hierarchy.

The data indicate that there isn't a single exceptional Equal Opportunity program in science and resources management in the NPS. Figure 2 shows all the regions falling within a woman or two of the average curve. Regional Directors and Chief Scientists who have been bragging about the number of women they have hired either have large programs, or they have added their hand-full of female resources managers and left it at that. The phenomenon of being able to predict the number of women very accurately by looking at program size, or vice versa, is probably an artifact of male group behavior or administrative indifference. The

similarities among the programs suggest that men in upper echelon positions are exerting informal social control over group composition, and keeping the women to a "non-threatening" 20 percent.

These results suggest the U.S. National Park Service needs to objectively monitor its hiring and promotion of women trained in the natural sciences. It also needs to look at the type of NPS natural resources programs which employ women (and those that don't). NPS did not take full advantage of the great increase in technically trained women from the mid-60s to the late 80s, and as of 1988, the percentage of women in research positions had not reached pre-1970 availability levels. In 1988, women were still greatly under-represented in administrative and upper echelon jobs. A long term pattern of low ratios of women in scientific positions also provides few women with the seniority and experience necessary to occupy leadership positions. Other agencies with many small programs staffed by relatively high graded or technically trained individuals may have similar difficulties.

Information sources

Data on percentages of women and minorities in science are from:

Sue E. Berryman, Who will do Science. Minority and Female Attainment of Science and Mathematics Degrees: Trends and Causes, A Special Report to the

Rockefeller Foundation, 1983; The Task Force on Women, Minorities and the Handicapped in Science and Technology, Changing America: The New Face of Science and Engineering, Washington, D.C., 1988; and from relevant tables published by *Chronicles of Higher Education*.

Susan P. Bratton is Associate Professor in the Department of Philosophy and Religion Studies, University of North Texas, Denton, where she is part of the graduate environmental ethics faculty. She worked for the National Park Service from 1974 to 1991, serving first as coordinator of the Uplands Field Research Laboratory in the Great Smoky Mountains National Park and from 1981 to 1991 as Coordinator of the NPS Cooperative Studies Unit at the University of Georgia, Athens. Her A.B. in biology is from Barnard College, Columbia University, and her Ph.D. is in ecology from Cornell. Bratton also has a graduate certificate in environmental ethics from the University of Georgia, and an M.A. in theology from Fuller Seminary.



NPS EMPLOYEES USE A LOT OF STUFF TO KEEP VISITORS HAPPY. THEY ALSO JUDICIOUSLY PRUNE AWAY HOLDINGS AT TIMES.

KEEPING "ROCKY" RUNNING

STEVE IOBST
CAROLINE EVANS

The call came at 6:45 a.m.: "Get two snowplows up here right away. People are stranded and the snow is piling up!"

This might not be considered an unusual request for a park in the heart of the Rocky Mountains. But the date was August 16! Snow removal, though infrequent in summer months, is a year-round job, especially since so much of Trail Ridge Road through Rocky Mountain National Park in Colorado is above treeline.

Keeping Rocky Mountain National Park open and running all year long is comparable to providing services for a mountain community of 3,500 residents. Rocky has housing for employees, campgrounds for visitors, 100 miles of paved roads, and 300 miles of trails. Like any town, the park requires a staff of carpenters, electricians, laborers, truck drivers, plumbers, equipment operators, painters, and mechanics to keep the place afloat.

When visitors come to Rocky, certainly their intention is not to worry about paved roads and housing developments. Instead, they come to enjoy spectacular scenery and watch wildlife. But in order to provide three million people a year with the opportunity to visit this 265,668 acre natural preserve, the park staff must offer many services and provide facilities.

On a typical summer night, 3,500 visitors and employees "live" within the park. They stay in campsites, houses, or dorms. They use water, sewers, electricity, and natural gas. Taking care of these facilities is the job of the park's maintenance workers. They clean the campgrounds and restrooms, collect garbage, and repair and maintain buildings. In a year the park uses 25,000 rolls of toilet paper and 100,000 garbage bags—enough to supply 1,000 households with toilet paper and garbage bags for a year. Our visitors use 50,000,000 gallons of water—enough to supply 1,800 households yearly.

The road crews apply 1,500 tons of sand on road surfaces during the icy months of winter which is enough to fill 4,500 backyard sandboxes. In addition to piles of sand and stacks of supplies, structures and equipment of all sorts exist to support Rocky Mountain's visitors. There are 450 buildings, 150 resi-



dences, 116 trail bridges, 120 vehicles, 60 heavy equipment vehicles, 17 miles of electrical lines, 118 vault toilets, 3,800 road signs, 1,010 road culverts, eight miles of retaining walls, and 95 restrooms.

While the above inventory is impressive, it is also worth noting that the park is divesting itself of some of its deteriorating facilities. Rocky Mountain National Park was established in 1915. At that time Congress stated that the park must be kept unimpaired for the enjoyment of future generations—yet open to the "freest use" of the public. From the 1930s to the 1950s, park managers decided that building a ski area within park boundaries was a project that would provide for the enjoyment of those visiting the park who enjoyed the new skiing rage. Swaths were cut through the forest to make ski paths, ski lifts were installed, and buildings were constructed to support the Hidden Valley ski operation.

Since 1950, however, the preservation side of the 1915 legislation began to prevail. Acting on the belief that developments do indeed degrade natural areas, the park service began to remove old resorts, ranches, and buildings from Rocky. The ski resort continued on, however.

In 1976, public hearings were held to determine the future of Rocky. The hearings culminated in a master plan which called for phasing out the park ski facility as soon as alternative ski areas were available for the public to use in northeast Colorado. Much later, in 1991, Eldora Ski Area, 45 miles away (60 minutes driving time), had completed an expansion and provided that alternative and superior ski area. NPS managers again reviewed their options. During the 1980s, the Hidden Valley Ski Area consistently lost money. Recreation and Park District (EVRPD) operated the ski area from 1978-1991, and during its last six years incurred an average annual loss of \$120,000. In addition, the

National Park Service subsidized the operation by \$60,000 per year.

There were other problems. For many years snow depth at Hidden Valley was inadequate for skiing. Snow levels had to be augmented by snowmaking machines which used water from Hidden Valley Creek. Water withdrawal from the creek had the potential to harm the threatened greenback cutthroat trout. Visitor demand for the ski area declined. Skier visits to Hidden Valley dropped dramatically from 44,000 in 1987 to 9,900 in 1991. Daily operating costs exceeded \$3,000.

When the EVRPD decided not to operate the ski area any longer, the park service solicited bids, but received no qualified ones. To interest an operator, massive infusions of funds were needed because the ski facilities did not conform to current national health and safety standards. Equipment was antiquated, and the ski trail design was unsafe with narrow, steep trails that merged expert skiers with beginners. Over \$1 million in improvements were identified just to bring the buildings up to existing codes.

In January 1992, National Park Service Regional Director Robert M. Baker announced the closure of Hidden Valley Ski Area to allow Hidden Valley to return to its natural condition. Ski lifts were removed. Water will no longer be diverted from Hidden Valley Creek. The scars of cut swaths through the forest will gradually diminish as the ski trails become reforested.

Although the Hidden Valley ski development has been removed, the other investments in infrastructure of the park continue to be maintained by staff for the stream of visitors which increases yearly. While skiers will no longer "snowplow" down ski trails, snowplows on the roads will continue to see to it that the "town" of 3,500 receives its garbage bags and toilet paper without interruption.

Steve Iobst is the Chief of Maintenance at Rocky Mountain National Park. Caroline Evans is editor of High Country Headlines.

This article derives from stories in High Country Headlines, the newspaper for Rocky Mountain National Park, Vol.1, Nos. 3 & 4.

WHAT DOES IT TAKE TO GET A PERMANENT NATIONAL PARK SERVICE JOB? IT TAKES TAKING CHANCES.

AH, THE MOUNTAINS AGAIN

Laurie Kurth

Trading the wilds of a Chicago suburb for the vast mountains of Glacier National Park is something few people have the chance to do. Frequently I am asked how I happened on this fortune, (or misfortune as some of my city friends would characterize it). My response is that I took chances. Lots of chances.

Growing up outside of Chicago offered little opportunity to become familiar with the vast and wondrous wilderness in our country. My parents' view of vacation involved hotels, not campgrounds. Sometime in eighth grade I started listening to John Denver music and, like others who listened to his music at that age, was intrigued with the idea of a Rocky Mountain High. I searched the books on mountains and came to the conclusion that I wanted to work for the National Park Service because they seemed to have a lock on the best.

During college I started applying for Park Service seasonal jobs. My initiation came at Cuyahoga Valley National Recreation Area in Ohio where I worked in the Ranger Division. At that time, the park was actively acquiring land from private owners. My responsibilities were to survey the recently obtained properties and document everything: vegetation types, structures, oil wells, and gas wells. This certainly didn't fit my idea of hiking through the mountains; however, it gave me great experience with resource inventories and personal relations.

News of budget woes dampened my spirits and removed the possibility of a second season at Cuyahoga Valley. That summer I volunteered instead at a state park near school. Prospects for the following summer looked dim again. But I had noticed an advertisement for Student Conservation Association fall interns and decided to take a chance that they would find something for me. I hastily filled in the application, checking areas with the earliest fall dates. I

received a call from Olympic National Park in Washington where one of their summer backcountry SCAs was unable to complete his term and they wanted to know if I could be there in a week or so. BINGO, it worked! I didn't know it then, but that was the start of a string of incredible opportunities.

After my second summer at Olympic, I was offered a GS-5 biological technician position in the Science Division at Indiana Dunes National Lakeshore. At the time the offer came, I was working at a nursing home and waiting to enter the seasonal law enforcement academy. I struggled with the idea of leaving the Pacific Northwest to return once again to the flatlands of the Midwest. I enjoyed my lifestyle and I could see my seasonal Park Service career advancing. Many of my friends thought I would be crazy to abandon Olympic for the Dunes. Sometime during the decision week, however, I realized that going to the Dunes would only mean losing out on the academy which I could pick up the following winter. Since the biotechnician job started in January, I could always return to Olympic for the summer. It was time to take another chance.

In my car, loaded with all my possessions—bike on the back—I headed out. With the mountains in the rearview mirror and highways headed east out my front, I wondered if I had done the right thing. But working for the Chief Scientist, Ron Hiebert, (now Chief Scientist, Midwest Regional Office) at the Dunes proved very rewarding. Ron gave me freedom to set up my own fire ecology studies as well as continue his research in exotic plant management and dune restoration. I easily adapted to the Dunes' vast flora, more than 1400 species, and dreaded the day I would tell Olympic I would not be there for the summer.

A sidelight to my work at the Dunes was the opportunity to finish my

Master's degree at the University of Chicago. In the fall of 1987, after finishing my college work, I received word that the US Army Corps of Engineers was looking for a GS-9 botanist. With my newly acquired M.S. I was qualified, but I really doubted if I could compete successfully for a GS-9 position. Once again though, I realized I had nothing to lose on taking the chance.

I got it, and after accepting, a few of my friends couldn't believe that I would even consider working for the Corps of Engineers, an organization that has a poor image to many environmentalists. Working on administering the Clean Water Act, however, was very satisfying. I was learning a lot about environmental regulations, working with people with a wide range of viewpoints, and I was helping reduce impact to wetlands. In 1987 and 1988 I worked on wetland and riparian systems evaluations for the Corps in Chicago. I believed then, and still believe today, that I was having a greater impact on protecting natural resources than with my previous job.

Within nine months, the job converted to career conditional, a status I had hoped to achieve. Three months later the position was upgraded to a GS-11. Taking a chance with the Corps turned out to be pure gold.

Four months after receiving government status, I found the vacancy announcement for my current job as a plant ecologist at Glacier National Park.

I had never expected my career to go the way it has. I often tell my story to career-seeking individuals to let them know that it does happen this way if they're willing to shun reservations and prejudices, look towards the future, and take the chances.

Laurie Kurth is Ecologist (Vegetation Resource Specialist), for the National Park Service, Glacier National Park, Montana. From 1988 to present she has been working on fire ecology research and management, vegetation restoration, and vegetation management programs. Kurth has a B.S. degree from Ohio University and an M.S. degree from the University of Chicago.

Nurturing parents give children the real-life skills they need for fulfilling, loving, and successful lives. John Dacey and Alex J. Packer wrote *The Nurturing Parent* (Simon & Schuster, \$11) and based the book on their four-year study at Boston College of creative kids. The children were super-creative, responsible, articulate, and socially adept. The parents nurtured them by trusting their child's fairness and good judgment, respecting their child's autonomy, thoughts and feelings, supporting their kid's interests and goals, enjoying the child's company, protecting them from injury or injuring others, modeling adult self control, sensitivity, and values they believed the children needed. Nurturing parents say yes to their child whenever possible as long as what the kid wants isn't dangerous to self or others.

Another book for parents is Loraine M. Stern's book *When Do I Call the Doctor* (Doubleday, \$12.50). She has answers to 200 common questions parents have about children's health. The 274 pages are divided into sections: e.g. newborns, head, bones & joints, skin, etc. Stern notes what is common and what is not normal, when to see the pediatrician, and what supplies to keep on hand (with a first aid chart foldout).

A basic first aid baby book is *Baby and Child Emergency First Aid Handbook*, edited by Mitchell J. Einzig (Meadowbrook Press, \$13). It has simple text and illustrations for such emergencies

as bites and stings, bleeding, burns, choking, convulsions and seizures, poisoning, sprains and strains.

The American Fisheries Society published *Sea Fare: The Official AFS Cookbook*, Volume One, with 191 recipes from members of the Society. Profits will go for AFS projects. The book includes nutritional information, some folklore, and fish terminology. Call 301-897-8616 for costs.

Those interested in the problems of harassment of women on campuses might want to read Billie Wright Dziech and Linda Werner's book, *The Lecherous Professor: Sexual Harassment on Campus* (University of Illinois Press, Urbana and Chicago). The title is very descriptive, don't you think?

The Green teacher: Education for planet earth is a charming journal-magazine for teachers and parents who want projects, activities, and ideas for young folks. Included in the February-March 1993 issue were articles on energy saving, environmental literacy, environmental leadership, and summer institutes for teachers. They have publications, tips, experiments, resources lists, and news, e.g. from amnesty international. The costs are \$27 for one year. Write them at 95 Robert Street, Toronto, Ontario M5S 2K5 CANADA.

Knowing when to remain silent adds to your presence, minimizes mistakes, prompts others to speak—allowing you to learn from what they say. Deborah A. Benton wrote *Lions Don't Need to*

Yes, I want to subscribe to Women in Natural Resources!

Send check or money order with your name and address to:

Bowers Lab, University of Idaho, Moscow, ID 83843.

Students \$15

Personal \$19

Agencies, universities, libraries, businesses \$35.

Roar (Warner Books) to assist people who need to surrender center stage to others at times, and who want to direct conversation by ignoring topics they'd prefer not to discuss.

Edward Pauly wrote *The Classroom Crucible: What Really Works, What Doesn't and Why* (Basic Books) to assist parents. For example, he advises you to pick your child's classroom teacher carefully. Ask other parents and teachers before next fall so that you can approach a principal with concrete information on why your child will work and learn better in a particular class. If the school doesn't respond, be persistent, because it is in the individual classroom that learning takes place, under the guidance of a specific teacher. No new education policy can change that reality.

If you have entered into a new living-alone period in your life, you may want to look at *Rebuilding When Your Relationship Ends* by divorce therapist Bruce Fisher (Impact Publishers). Some of the time-proven advice is given: don't rush into new relationships, see loneliness as a healing period full of introspection and inner development, and more.

As you think about your summer camping trips, *The Camper's Companion: The Pack-Along Guide for Better Outdoor Trips* (Foghorn Press) might be a good investment. Authors Rick Greenspan and Hal Kahn have a number of tips, e.g., set aside an afternoon of rest for every morning of travel, and a full day's rest for a full day's travel. They also have formulas for hiking, canoeing, and biking pleasure and safety.

Eli Portnoy is a consumer advocate who wrote *Let the Seller Beware* (Collier Books). It is a guide to getting the most for your money.

Stephen M. Pollan wrote *The Big Fix-Up: How to Renovate Your Home Without Losing Your Shirt* (Fireside Books). It fits in the plethora of how-to books and is about getting the most out of

your home improvements if you are intending to sell your home within a few years. Some improvements add more: light paint, landscaping, exterior cosmetics, moderate kitchen and bath upgrades. Worst values: swimming pools, hot tubs, spas, customized or built-in furniture, deluxe carpeting, etc.

A book still in press called *No Man's Land: Men's Changing Commitments to Family and Work*, is by Kathleen Gerson, a sociologist at New York University. She says that men's interest in parenting is a sign of hard economic times—what she calls the decline of the breadwinning male. Instead of looking at what has happened to fathers, we are still obsessing about how mom working outside the home will affect children. The book should be out this summer.

A nice, compact view of winter is Alan M. Cvancara's *Exploring Nature in Winter: A Guide to Activities, Adventures, and Projects for the Winter Naturalist* (Walker and Company \$17.95). He's a professor of geology at the University of North Dakota and a Fulbright scholar, so the book is full of learned stuff, but also full of recreation ideas, new ways to define ice and snow, winter plants, forecasting. It's written for lay persons and would be good for birders, skiers, campers—and young people.

Skipping Stones: a Multicultural Children's Quarterly Forum is a non-profit children's magazine that explores and teaches about "stewardship of the ecological web that sustains" the earth's people. It celebrates cultural and linguistic diversity. Each issue has a guide for parents and teachers. Subscriptions are \$15 for individuals, \$20 for institutions. Send check to PO Box 3939, Eugene, Oregon 97403-0939 (503-342-4956).

The Women's Natural History Project has a catalog of products you might find interesting if you are looking for books, videos, posters, and gifts with women's history as a focus. Call 707-838-6000 for the catalog and information.

WORKING ON THIS ENORMOUSLY COMPLICATED PROJECT HAS BEEN AN EXERCISE IN TEAMWORK AND INTERNATIONAL DIPLOMACY. THE NUMBERS OF STUDIES AND DISCIPLINES INVOLVED IS FASCINATING.

THE PROPOSED BERINGIAN HERITAGE NATIONAL PARK

DALE L. TAYLOR

Introduction

Beringia, that area of Alaska, Northwest Canada, and the Russian Far East, has intermittently been a dryland connection between Asia and North America. Evidence of that connection remains today in the shared language, geneologies, cultural traditions, and plant and animal communities that occur on both sides of the Bering Strait.

Opportunities abound for cooperative studies of the cultural and natural history of Beringia. These opportunities will be greatly enhanced by the establishment of an International Park that spans the Bering Strait in Russia and the U.S. (Fig.1).

As now being planned, the International Park will include authority to enter into cooperative agreements between the park managers in Russia, U.S. managers, Alaska Native groups, other governmental groups, universities, and academics. The park will be funded and managed according to rules and regulations of the respective countries.

Joint research and educational centers are envisioned on each side of the Strait. Organizers are interested in aspects which will

- promote and protect the culture of the indigenous people
- increase knowledge about the history of the earth
- shed light on the evolution of flora and fauna
- further knowledge about biotic diversity
- study common cultural resources
- feature cultural festivals, exhibits, carving demonstrations
- provide a setting for seminars and classes

Diplomacy

Even though the concept of an international park in this unique environment is at least 30 years old (Roberts 1985), it is the recent political climate that presented a window of opportunity for considering its creation. Beginning in 1989, under the Joint



Fig. 1

Soviet-American Agreement on Cooperation in the Field of Environmental Protection, a series of working groups exchanged visits between Alaska and Russia. Denny Galvin, National Park Service (NPS) Associate Director for Planning and Development in Washington, D.C. is the project leader.

These working groups developed plans that describe funding, management, and research strategies for areas to be preserved in the park in each country. On June 1, 1990, Presidents Bush and Gorbachev signed a joint statement endorsing establishment of an international park. Following meetings with Native villagers in Northwest Alaska, updated draft legislation is being prepared that will designate the Bering Land Bridge National Preserve and Cape Krusenstern National Monument as the U.S. portion of the international park (Fig.1). The Russian legislature has held hearings, and a draft plan of the Russian part of the park has been presented to the Russian legislature and the executive government.

Women as key players: managers

Working groups have included women



Fig. 2

in key roles. On the U.S. side, Leslie Starr-Hart, former Chief, Cultural Resources Division, Alaska Region, organized and coordinated the first working group meetings in Alaska and Chukotka. Prior to *glasnost*, most of Chukotka was off limits to foreign visitors, making travel plans especially difficult. Starr-Hart's prior work with the NPS International Affairs Office on NPS-sponsored projects, her supervision of the Sitka National Historic Park's Russian-American project, and her work with the Russian National Park Service in Moscow were important aspects in planning. Starr-Hart is now Chief, Office of Professional and Employee Development in the NPS Denver Service Center.

Dr. Ludmila Bogoslovskaya, of the Severtzov Institute of Evolutionary Animal Morphology and Ecology, Moscow, has been the Russian project team leader since late 1990. She has travelled extensively in Chukotka and published widely on her marine mammal research in the Chukotka Peninsula (Krupnik, et.al., 1983), giving her a sensitivity to the Native people and intimate knowledge of the resource questions. Her photographs and her husband's drawings document the 1980-81 condition of many of the coastal cultural resource sites.

Dr. Ludmila Kuleshova, Chief, Department of Protected Areas, All-Union Research Institute of Nature Conservation and Reserves, Moscow, is a park planning team member (Fig.2). An ornithologist by training, she now oversees the vast reserve system in Russia (Kuleshova, In Press). Dr. Kuleshova was the team leader in the creation of the

joint USSR-Finnish *Friendship Zapovednik* (a strictly controlled biological reserve) on the border of the two countries.

Zoia Fedulova, an architect (St. Petersburg State Institute of Town Planning, St. Petersburg, Russia) was instrumental in writing the plan for the Russian side of the international park. She led a group that developed the plan establishing Baikal National Park in Eastern Siberia.

Women as key players: directing research

The National Park Service began sponsoring a long-term "Shared Beringian Research Program" in 1990. Key to developing the research has been Jeanne Schaaf, Archeologist, Alaska Regional Office (Fig. 3). Her past research and her personal knowledge of the Bering Land Bridge area provided the foundation upon which the research program was built (Schaaf 1988). She stated "the Shared Beringian Heritage program brings Russian and American scientists, resource managers, and Native people together in a long-term, integrated study of traditional lifeways, biogeography, and landscape history on the Seward and Chukotsk Peninsulas. Though the program is divided into separate research components, recognition of the *connectedness* of people, place, plants, animals, and landscape processes through time is central to the program. The recognition of this interrelatedness and the attempt to design and carry out the research accordingly are what makes the Shared Beringian Heritage Program so singular" (Schaaf 1992). She developed a laboratory at the village of Shishmaref where researchers share findings with the local population and participate in instruction at the schools. Among other projects, Schaaf co-manages the Shared Beringian Heritage Program with the author. She is a Ph.D. candidate in the Anthropology Department at the University of Minnesota.

The biological component of the reindeer herding project includes an analysis of reindeer productivity and range condition. Reindeer herding in Bering Land Bridge National Preserve continues in accordance with the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. Anne Coupland is the Reindeer Range Specialist for the preserve, stationed at the Nome headquarters (Fig. 4). She has worked in other NPS units and holds a degree from the University of California, Santa Cruz. She arrived from Guadalupe Mountains National



Fig. 3



Fig. 4

Park to participate in ongoing research projects that will provide greater understanding of this complex resource management issue

A part of the reindeer research program at the University of Alaska Fairbanks is funded by the Shared Beringian Heritage Program. Nancy Karidis, research associate at the University, interacts with herders, and participates in fawn tagging, de-antlering, vaccinating, and butchering. She conducts remote field analyses of forage by transect methods. She will participate in exchange programs with Russian herders and researchers. Her training includes a Bachelor of Science degree in biology and experience in wildlife disease, wildlife husbandry, and human cancer research.

An international Panarctic Botany Project, under the direction of Dr. David Murray, University of Alaska Fairbanks, and Dr. Boris Yurtsev, Komarov Botanical Institute, St. Petersburg, will inventory and analyze arctic plants. The first phase of the project began in the Bering Land Bridge National Preserve as part of the Shared Beringian Heritage Program. Dr. Barbara Murray, specialist in non-vascular plants, is a participant researcher. Her work with mosses and lichens in the arctic earned her a national and international reputation. Working with her is Dr. Michael Andreev (lichens), Dr. Olga Afonina (mosses), and Dr. Alexy

Potemkin (liverworts) from the Komarov Botanical Institute (Fig. 5). Preliminary results from the summer 1992 collections show many species of lichens and mosses to be new identifications for North America, and many new to Alaska, and the Seward Peninsula.

Dr. Sylvia Kelso, who described a new species from the Seward Peninsula, is a member of the vascular plant team on the Panarctic Botany Project (Kelso 1987) (Fig. 4). Currently an Assistant Professor of Biology at Colorado College, Dr. Kelso is making a major contribution to understanding vascular plants on the Seward Peninsula. Collections made during 1992 show numerous plant range extensions and collections that may include new species.

NPS biologist Carol McIntyre has worked with raptors for approximately 10 years. Her Master of Science thesis, being completed at the University of Alaska Fairbanks, deals with her long-term work on golden eagles in Denali National Park. Results of her work have

been presented at meetings in the U.S., Scotland, and Germany. McIntyre's Beringian project is to use satellite technology to determine movements of gyrfalcons. She has documented movement from a nesting site in Alaska to near Anadyr, Chukotka, Russia, and back to Alaska where the bird is now overwintering.

Beringia is a geological and paleoecological gold mine of information on past conditions of the planet. Information about plant life over time is found in remains trapped in maar lakes (formed from a volcanic explosion) and from thaw lakes. The ash (called tephra) that fell from the maar lake explosions covered and preserved plants in place at various times in the past. Plants preserved under the tephra can be identified to species, allowing comparisons of past and present vegetation.

Dr. David Hopkins, internationally known for his work in Beringia, is overall director of the geological and paleoecological research. He and his colleague, Dr. Julie Brigham-Grette, University of Massachusetts, initiated a joint project with Russian scientists to review and revise the late Cenozoic glacial and sea level history of the Bering Strait region. The project evolved out of their work over the last 10 years to revise the stratigraphy of the coastal regions of western and northern Alaska. The project is jointly sponsored by the National Science Foundation

and the Shared Beringian Heritage Program. Dr. Brigham-Grette's dissertation was on the sea level history of the Alaskan North Slope over the last three million years. Brigham-Grette specializes in stratigraphy (the arrangement of geologic layers) and in amino acid geochronology (the past as indicated by geologic data), a method of dating carbonate fossils. Due to cold ground temperatures in the arctic and subarctic, the method can successfully date materials as old as four million years and is most useful for correlating widely spaced sediment sequences. The new study along the Russian coasts of Kamchatka and Chukota represents an extension of this new data based on fossil shells. No one in Russia as yet, does amino acid geochronology on mollusks.

Patricia Heiser, a graduate student of Dr. Hopkins at the University of Alaska Fairbanks, is contributing to understanding the glacial and sea level history of the Bering Strait region. She hopes to continue toward a Ph.D. project to compare the glacial histories of the Seward and Chukotsk Peninsulas. Brigham-Grette's graduate student, Sonja Benson, is studying the timing and paleogeography of at least two periods in the last 500,000 years when glaciers growing from the mountainous regions of Chukotka advanced onto the emergent Bering Strait and terminated against the western end of St. Lawrence Island. Her translations of Russian literature are an integral part of her work.

Dr. Mary Edwards, Assistant Professor, Department of Biology and Geology, University of Alaska Fairbanks, and her colleagues are documenting past changes in the Bering Land Bridge Preserve by study of the age and sequence of tephra deposits (tephrochronology), the age and types of pollen found in lake cores, and from plant and animal remains buried under the tephra. Dr. Edwards was educated at the University College of Wales, Aberystwyth, and the University of Cambridge. She has previously taught at Marlboro College, Vermont, and the University of Oregon.

Field assistants for this phase of the project include undergraduate students Tiffani Fraser from McGill University, Montreal; Claudie Hoefie of Frankfurt, Germany; Patti Crow of the University of Alaska Fairbanks; and Wanda Weyaiounna, a resident of Shishmaref, who is an aviation company employee, a trained EMT, and a member of the National Guard.

A people project

The Beringian Heritage International Park project is an effort to enhance human values. Understanding Native lifeways past and present, and breaking barriers between cultural and natural resources to provide a greater understanding of common Beringian elements is extremely valuable. Employing the most qualified people is a must. It is a people project and many of those people are highly qualified women. We now await completion of legislation—by still other people—to make the Beringian Heritage International Park a reality.



Fig. 5



Fig. 6

Author Dale L. Taylor is Special Projects Leader in the Alaska Regional Office of the National Park Service. He is a member of the Beringian Heritage International Park planning team, co-manages research for the Shared Beringian Heritage Program, and develops inventory and monitoring and global change programs. He is a member of the US Man and the Biosphere High Latitude Ecosystems Directorate. He has taught at the college level, co-chaired the interagency team that completed fire management plans on 360 million acres in Alaska, and conducted research in Yellowstone, Grand Teton, Everglades, and Big Cypress for NPS. His Bachelor's and Master's are from Kansas State University, and his Ph.D. is from the University of Wyoming.

Figures

Figure 1. The Russian Far East, Alaska and portions of Canada outline the approximate area of "Beringia." Hatched areas are proposed as the Russian and American parts of the "Beringian Heritage International Park." Drawing by Kate Solovjova.

Figure 2. Planning team member Dr. Ludmila Kuleshova.

Figure 3. Dr. Craig Gerlach, Jeanne Schaaf, and Gideon Barr examining an Eskimo archeological site, Bering Land Bridge National Preserve. Photo by Jennifer Krammer.

Figure 4. Dr. Sylvia Kelso, Dr. David Murray, and Anne Coupland comparing notes following a day of plant collecting at Killeak Lake, Bering Land Bridge National Preserve.

Figure 5. Dr. Olga Afonina (right) and Dr. Alexy Potomkin (left, in pit) collecting non-vascular plants from lava beds, Bering Land Bridge National Preserve.

Figure 6. Planning team meeting with the Mayor of Loreno, Chukotka. From left Valentin Mostyaev, Dr. Alexander Andreev, Alexander Nosonov, Loreno Mayor Ludmila Ivanovna, and the author, Dale Taylor.

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Author Dale L. Taylor is Special Projects Leader in the Alaska Regional Office of the National Park Service. He is

TRAINING AND GOOD SENSE ARE KEY

NANCY DESCHU

I was again coaxing the temperamental helicopter fuel pump to start, when an elderly woman and her natty hiking group came over the ridge and startled me. She politely introduced herself and asked about the field research camp they had stumbled upon. She then looked at the fuel pump and my greasy hands and asked me quite pointedly, "Does your mother know what you do?"

I hesitated for a moment and then explained that, yes, my mother knows I studied natural science and hydrology and that I work for the National Park Service in Alaska. And yes, I said, she knows generally the type of research I work on. But no, I admitted, she does not know that day to day I fix fuel pumps. Or wade rivers with chunks of ice floating downstream past me. Or that I work in an environment where my sixth sense is tuned to the presence of bears. Her motherly face was fixed on me as I spoke, and then, in either kindness or shock, she invited me to have dinner with her group at the very fine backcountry lodge where they were staying.

I have since recalled that meeting with amusement, for at that moment I had articulated to the woman what I had known instinctively: scientists and resource managers in the National Park Service in Alaska really have two jobs: 1) protecting park resources and 2) surviving in the backcountry, although not necessarily in that order. Women and men in the National Park Service in Alaska must devote a good part of their time to planning and conducting difficult field operations to carry out their basic jobs as resource managers and scientists.

Alaska boasts 15 national parks encompassing 54 million acres ranging from arctic mountain ranges in the north to whale-rich bays in the southeast. A sense of solitude and wilderness, phenomenal wildlife sightings, and spectacular scenery are just a few of the reasons people choose to live and work in Alaska. The draw to this land is strong and the challenge of working on the "outer edge" is just part of the deal.

Just why is Alaska so demanding of its people who venture into the backcountry?

The great expanse of land and the very limited road system make access to field assignments in Alaska truly an expedition at times. Most access to backcountry sites is by helicopter, fixed-wing airplane, motorized boat, river raft, or by foot; however, use of dog sled, snowshoes, skis, snowmachine, and kayak is not uncommon.

Scheduling the appropriate type of access for the specific job and terrain and then beating the weather, which can turn foul with little notice, is the ultimate challenge. The small window of the year for summer field work is narrowed yet smaller by foul weather causing aircraft to be grounded. Personnel must plan carefully and have several contingency plans. Volcanic eruptions can cause an unpredictable shut-down of air travel and ash fallout can blanket the snow causing disruption to snow travel. Despite aircraft and boating safety programs conducted within the Department of Interior, accidents still occur each year in Alaska.

Across Alaska, the human population is sparse and over 50 percent of that population is concentrated in the three cities of Anchorage, Fairbanks, and Juneau. So another factor that must be considered in field operations is the realization that any help from people or a passing airplane is unlikely. Sometimes handheld radio contact to park headquarters is not possible due to topographic interference or distance to a radio repeater. Self-reliance must be assumed.



On one occasion, for example, a colleague and I were waiting at a remote airstrip in northwest Alaska, after having finished several days of field work. When the small plane arrived to pick us up, the pilot unloaded two 55-gallon barrels of fuel from the rear of the plane, and then realized he had forgotten to bring along the plane seats to put back in the plane where the fuel had been stored. Flying without seats is against regulations and obviously not safe, so the pilot took off and left us behind, promising to return that evening. The bad news is that the weather turned foul and he was unable to return to pick us up for several days. The good news was that we had plenty of food and there were natural hot springs with fine bathing nearby.

Being located between western Canada and far-eastern Russia provides opportunities for Alaska field staff to travel to these countries and work with foreign scientists. Planning access for assignments of this type sometimes requires complex arrangements to reach the destination and then to clear customs when NPS staff arrive in remote towns.

I recall one time flying for an hour from an Alaska border town to Whitehorse, Canada, to simply clear Canadian customs; we then immediately backtracked to reach our destination which was a dirt landing strip in Canada not far from our original take-off point in Alaska. Coming back into the U.S. we had to fly to yet another Alaska town where a U.S. customs agent was based before we were able to return to our original starting point, which had no customs agent.

Despite efforts to negotiate with customs agents ahead of time to streamline our trip, our extra flight time that day amounted to nearly three hours.

Even on a warm summer day, danger lurks in the cold glacial waters, the sudden change in weather, or in the aircraft that does not make it back for pick-up. I remember not being too

concerned about winter-like conditions in July on the Noatak River in northern Alaska when I was planning for one of my field trips. I was more concerned about being prepared for mosquitoes, bears, and sunburn (an important consideration when there can be nearly 24 hours of sunlight). On this particular July 17, however, as I paddled down the river it became colder and colder and finally it began to snow and the snow continued through the day. I had to wade in the river thigh-deep to redirect my kayak from a river meander that would have separated my co-worker and me perhaps for days. Although I had other dry clothes, I had difficulty sustaining my body warmth after having been chilled. The lesson here was to take some Alaska winter clothing along with the standard Alaska summer clothing even if it is July.

Winter field work demands special efforts to keep instruments and equipment warm enough to function and keep the humans warm enough to operate them. Field staff conducting winter work must also be aware of avalanche danger, knowing the warning signals to stay out of potential avalanche paths. Working on or near rivers in the winter requires field personnel to be careful of weak ice or open leads in the ice. The potential to encounter bears is another factor that must be kept in mind while in the field in Alaska, particularly working in dense vegetation where visibility is limited, or near rivers where sounds of the water can mask the sounds of bears rustling in the nearby brush.

Our challenge last winter while working on a tributary of the Yukon River, was to prevent water quality samples from freezing. We used a prototype heater-box made from a cooler—a different perspective from summer field work where we work to keep the samples cool. In addition to keeping samples from freezing, we wrestled with keeping batteries warm and charged to be able to run the underwater video the next day. We spent a good amount of time preparing hot water bottles to keep the instruments, batteries, samples, and people in working order.

So how do NPS scientists and resource managers prepare to work in the Alaska backcountry?

The most important aspect of field work in Alaska is to be well-versed in survival methods and to develop the right attitude, confidence, and readiness to survive: we get these through formal training courses, on-the-job training with experienced colleagues, and perhaps most importantly, experimenting with new ideas. Each park and regional office division approach their training differently depending on their individual field programs. This leaves a varied level of skill among employees, primarily as a function of individual managers' perspectives on the

importance of safety and survival in their program.

1. Helicopter flight and safety training is a standard course each year where employees work on accident prevention. In addition, standard safety procedures, such as loading gear, working around an operating helicopter, and inspecting fuel are reviewed and practiced. Staff also learn to escape from submerged aircraft, which entails classroom instruction before the employee is dunked into a pool upside-down-and-spinning in a simulated aircraft seat, from which they must calmly evacuate in a series of practiced steps.

2. Pinch-hitter piloting is another standard training course, where staff who fly as passengers learn the basics of navigating, flying, and landing a plane in the case the true pilot becomes incapacitated.

3. Training in the deployment and use of life rafts is important, along with the use of survival suits—a heavily insulated, bulky, and buoyant suit requiring some practice to get on and zipped up. Pool training sessions are amusing to watch, as staff wallow around like bloated orange whales trying to beach themselves into life rafts.

4. Distress signalling training teaches the use of signal mirrors, flares, dye tracers, and emergency locator transmitters (a device that signals passing satellites).

5. Each year field personnel are taught about new research on grizzly bears and black bears and what is the best course of action in an encounter. In addition, staff attend shotgun training and practice shooting canisters of bear spray, a highly noxious cayenne pepper mixture that has been shown to deter bears if used properly.

6. Eventually, and most often informally, NPS field scientists learn the basics of snowshoeing, skiing, kayaking, dogsledding, rafting, and other methods of getting around.

7. Most important, personnel learn what works best to keep warm and dry. Important skills to be learned in this category include: fire-starting with a variety of materials; assembling warm "clothing" from wreckage and natural materials on site; emergency shelter construction; and wilderness first-aid. Along

these lines, field vests are being developed for National Park field staff in Alaska that include the basic items for survival.

Experimenting and word-of-mouth keeps the quest for warmth ever evolving. For example, heavy vapor barrier boots, a civilian byproduct of military research and affectionately known as "bunny boots" provide great warmth. The hard part about bunny boots is taking them off at night and putting them back on the next morning after the vapor has frozen and the boots are stiff with ice. Ideas about how to best warm bunny boots in the morning is material for fruitful discussion. Some people prefer putting fuel-powered handwarmers in their boots overnight, but there is a risk of melting the rubber shell. Another option is to place them in the bottom of one's sleeping bag overnight, but of course this initially means the unpleasant experience of cold boots at the bottom of a warm sleeping bag. Personally, I prefer to fill liter bottles with boiling water and wedge the hot bottles into the boots until the boots are thawed and warm; the trick with this approach is to keep warm feet while waiting for the water to boil.

Many protocols for safety and survival are evolving in this relatively new frontier of national parks in Alaska. As unexpected events occur, such as the Exxon Valdez oil spill, new field operation and survival questions arise. Safe and efficient field operations are the solid foundation upon which we pursue our primary purpose and passion: studying and protecting the spectacular natural resources on 54 million acres of wild lands.

Nancy Deschu is a hydrologist with the National Park Service, Alaska Regional Office. Her career has taken her to the Florida Keys, Everglades, Denali National Park, Washington D.C. and places between. Her degrees are from Rutgers College and the University of Washington.

Photos: On Nation River doing field work in Chawley Park, Yukon; Rapids below Tats Creek; Sling-loading the helicopter.



Super Bowl reflections

If a man describes a woman in shallow, one-dimensional or purely physical terms (e.g., "she's got a body that could melt a polar icecap") he is probably a sexist. If one man describes another man in the same fashion (e.g., "he's got a body so big he needs his own zip code") he is probably a sports commentator for NBC.

....Pete Gomben, *Argonaut*, February 2, 1993

There are some things to be learned about fish handling from this study of bass tournament catch and release

The catch-and-release concept is considered one of the major factors in the success of bass tournaments. Bass are truly renewable resources when properly managed. Most bass tournament sponsors realize high release rates are smart business moves. The Alabama Game & Fish Division began a study in 1991 to determine the rate of delayed mortality during summer bass tournaments and how that mortality could be reduced. Fourteen bass tournaments were sampled between mid-May and mid-September of 1991-92. During sampling, bass were taken after weigh-in and held four days. The bass were divided into three pens, each of which also held three to five control bass. Water quality factors such as dissolved oxygen levels, total alkalinity, pH and water temperatures were recorded early in the morning on day 1 of each tournament and late in the afternoon on day 4. During the two years of the study, 865 bass were held for observations.

Three factors clearly influenced the number of fish that died after release: climatic conditions (warmer water allows for infections on handled fish), bass size, and tournament rules. The average delayed mortality was 20.5 percent. Bass 12-19 inches had a

constant rate at 19 percent death, but bass 20-22 inches had death rates twice as high. Some tournaments had as high as 30-62 percent mortality. So organizers can make a big difference in how many fish live. Tournaments must flow smoothly so that fish handling and holding is minimized. Researchers determined 10 aspects that seemed to increase survival: If more than 10 boats participate, it helps to have two or more groups weigh in 15 minutes apart to lower waiting time. Lower creel limits and penalties for dead fish encourage anglers to take care of their fish. Plastic bags with water are the preferred means for transporting fish from boat to weigh-in site. Limit bags to 10 so fish wait in live wells instead of bags. Pre-weigh-in tanks with aeration should be filled with lake water, not tap water (little oxygen), shortly before weigh-in (to keep the water cool). Anglers should dip bags in the tanks for fresh water as they wait to weigh their fish. Ice can be used to cool holding tanks to 10-15 degrees lower than the lake water to reduce mortality. A post-weigh-in tank is good to observe fish before releasing. Wearing cotton gloves protects mucous and limits dropping and using knotless nylon or rubber nets (not knotted stiff nylon) prevents injury. Sliding fish back into the lake with PVC pipe and flowing water also assists reentry.

....Ken Weathers, *Alabama Conservation*, Winter 1993

The Natural Landmark Program

A National Natural Landmark (NNL) is a nationally significant natural area that has been designated by the Secretary of the Interior. To be nationally significant, a site must be one of the best examples of a type of biotic community or geologic feature in its physiographic province. Examples of this natural diversity include terrestrial and aquatic ecosystems; features, exposures, and landforms that record active geologic processes as well as fossil evidence of biological evolution. The goal of the Landmark Program is to identify, recognize, and encourage the protection of sites containing the best examples of geological and ecological components of the nation's landscape. Natural Landmarks are designated on both public and private land with the program designed to have the concurrence of the owner or administrator. Selection criteria include: illustrativeness and condition of the specific feature, and secondary criteria have to do with rarity, diversity, and values for science and education. Recommendations quite often come from State Natural Heritage Program inventories or by other groups including The Nature Conservancy. The National Park Service contracts with scientists to conduct on-site evaluations of those areas which are highly ranked either in the theme studies or from outside recommendations. NPS must receive prior ap-

proval from the landowner to conduct the on-site evaluations. The evaluations gather additional information and comparatively evaluate the site against other similar sites, using the national significance criteria. The sites are then peer reviewed and then reviewed by NPS. If qualified, and the landowners consent, the site is nominated by the Director of NPS to the Secretary of the Interior, who then lists it with the National Registry of Natural Landmarks. During the designation process, NPS solicits comments from the public. As of December 1992, 587 sites have been designated. To date 16 of them have been included in 13 units of the National Park System.

....Steve Gibbons, *Landmark News*, Winter, 1992

Marching to a new philosophy

Did you know that the Department of Defense (DOD) is the largest single energy user in the United State, at a cost of about \$2.5 billion annually? Did you also know that since 1975, DOD has reduced its energy use by nearly 25 percent through energy-efficiency and conservation programs. Davis-Monthan Air Force Base in Tucson, Arizona, has joined with American Forests, the US Environmental Protection Agency, USDA Forest Service, and DOD's Lawrence Berkeley Laboratory to conduct a three-year-long-analysis of the costs and benefits of planting trees and lightening surface colors for energy conservation. The base's similarly built housing will allow researchers to note savings as renovations, tree plantings, paints, air conditioning systems are installed. The cookie-cutter housing improvement information can be transferred to other bases as well.

....*Urban Forests*, February/March 1993

This was written on Forest Service stationery, but, hey, draw your own conclusions

Recently I was the victim of a unique accident, which I feel should be brought to your attention. While on a management coordination trip with personnel of Yellowstone National Park in Grizzly Situation I country, we camped for the night. Food and other bear attractants were placed in two panniers and tied together along with 100 pounds of horse feed (grain) in sacks. We rigged a pole and pulley, and four of us hoisted the stuff some 25 feet off the ground as required by the regulations for occupancy in grizzly country.

The next morning, I was first up, and after building a fire decided to put the coffee on. I untied the rope in order to lower the panniers and grain, and so as to have firm control, wrapped the rope around my wrist. However, I forgot that the weight of the

suspended load significantly exceeded my body weight and I was violently propelled upward, scraping my shoulder and side against the tree and banging my lower back on the pannier as they went past. Upon reaching the top, I severely jammed my fingers in the pulley.

At the same instant, upon striking the ground, the grain sacks burst, spilling their contents and resulting in my body weight being heavier than the panniers of food. I then rapidly descended as the panniers accelerated upward. Midway, my left leg collided with the panniers, spraining my knee badly. I then struck the ground hard, breaking a rib and spraining my right ankle.

At that point, I think I lost my presence of mind, for I released the rope allowing the panniers to fall. Unfortunately, they struck me on the head causing a mild concussion and rendering me unconscious.

I am told, but am unable to verify, that upon hearing the noises and my shouts, two Park Service people fired four shots into the Coleman stove thinking in the grey light of dawn that it was a bear. Ranger Fox was about to shoot his horse, picketed nearby, for the same reason, but was prevented from doing so by Ranger Murdock who ran into him while attempting to dodge the gunfire.

I am further told that I was packed out using a variation of a diamond hitch to rig a travois. Some said it reminded them of Lee Marvin in "Cat Ballou," but I'm sure they exaggerate.

....Anonymous, *The Snag*, Fall 1993

Paper recycling saves landfills, not trees

When we think of the trees we'll save, we probably think of the giant, picturesque trees in the great forests of the Pacific Northwest. In fact, those trees are seldom, if ever, harvested just to make paper (although residues from the trees are). They're too valuable for that purpose. These trees make lumber and the panel products that we use in home-building. The only way to harvest fewer of these big trees is to build fewer houses. Trees are, of course, cut down to make paper. But these are chiefly the small, fast-growing pines that are typically planted on tree farm plantations, especially in the southeast. These crops of conifers originate from seedlings grown in nurseries and are mechanically harvested every 20 years or so. By that time, they have grown to pole size. A basic reason why more paper recycling won't save trees has to do with the economics of tree farming. The trees used for making paper are planted and harvested like any other crop. Private forest landowners are planting or replanting three million trees *every day*. State or federal agencies are also planting, and millions of additional acres of hardwood forests reseed naturally.

This means we are growing more trees than we're harvesting or losing to insects and disease. The US has more trees today than we had 70 years ago.

....George Hopper, University of Tennessee's *Renewable Natural Resources Timely Tips*, June, 1992.

Welcome to a fairly revolutionary idea: Mommy-trackers can actually flourish in this era of corporate change.

Or, if the job doesn't fit anymore, they can use the track as a vehicle of change to create a more flexible, satisfying career path. Those possibilities seemed remote four years ago, when Catalyst founder Felice Schwartz was virtually branded a traitor by many working women for suggesting in a *Harvard Business Review* article that companies think of female employees in two categories: "career primary" who put work first, and "career and family" women, who, for a prolonged period, would need extra consideration from employers to balance their lives. Despite what Felice Schwartz predicted and what many women feared, in most industries, professions and jobs, it is proving possible to be an active mother and a valued employee. And although they're still in the minority, there are women who are advancing their careers while raising children.

A 1992 study by Philadelphia benefits consultant Hay/Huggins found that 36 percent of large US companies now offer flexible-hours policies, and 14 percent have telecommuting programs (almost half permit paternity leave). The Conference Board estimates that several hundred US firms now have work/family managers, most of whom have been hired within the last two years, to develop and administer benefits for parents.

There are downsides. The Conference Board recently surveyed 150 managers who monitor flexible work programs and found that the vast majority of workers won't use them because of the stigma attached to devoting less than 1,000 percent to work. "Part-time can be viewed as failing somehow," says Arlene Johnson, vice president of the Families and Work Institute. "How many women do you hear saying, 'I only work part-time,' as if they are apologizing, as though they are not making a valuable contribution." A lot depends on the corporate culture, Johnson says, "If you're working in a company where they're no evidence of flexibility, you may think it's at a risk worth taking. You may be afraid it will hurt your credibility." Perhaps the greatest career risk in putting family first is financial. Whether women work part-time or drop out completely for a number of years, their earning power will probably decline, perhaps dramatically. Economists Joyce Jacobsen and Laurence Levin recently studied the salary histories of more than 2,000

Women in Natural Resources will be celebrating its 15th anniversary in September 1993. If you have a story to tell about the first time you saw the magazine, or something amusing that occurred because of it, we would like to hear from you. Send your anecdote (or full length manuscript) to:
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women and found that those who leave work for even a year never catch up to women who keep on working.

Another tricky issue is benefits. Many part-timers are on payrolls technically as "consultants," without health insurance vacation pay, or the automatic salary hikes. But firms who want to keep employees are beginning to budge. A 1990 Hewitt Associates study of 435 companies found that a majority were prorating benefits according to the number of hours worked (usually a minimum of 20). Social Security is even murkier.

Mommy trackers have found ways to keep moving forward in their careers while their children are young. 1. Define your objectives: is it just to slow down, or to find a different job altogether? 2. Older is better because the further along in your career you are, the more leverage and options you have. 3. Find family-friendly supervisors and companies. 4. Have a plan to talk to your employer about. 5. Use the track as a career experiment and to take stock of your life goals. 6. Don't stay away too long and especially don't drop out completely.

....Barbara Kantrowitz and Pat Wingert, *Working Woman*, February 1993

Purple loosestrife, here's the gauntlet!

The New York Cooperative Fish and Wildlife Research Unit are convinced they have discovered an effective biological control for one of North America's worst pest plants, purple loosestrife. In July 1992, the first confined releases of three beetle species that are natural enemies to purple loosestrife began following years of testing and approvals. Dr. Richard Malecki, Leader and Coordinator of the Unit and Working Group now believes they can use controlled releases of beetles to reduce or limit it. Purple loosestrife has spread rapidly westward after choking wetland systems throughout the northeast. Disjunct populations dot north America westward to the Pacific Ocean. No traditional controls worked on it. Scientists develop biological control programs only af-

ter conducting extensive research on the life histories of the plants and the insects or pathogens to be used as control agents. These studies indicate the suitability of the insects for host specificity or the tendency of the animal to feed on or use only a specific plant. If tests show it will feed on or otherwise affect other plant or animal species in the area, then the insect is rejected. Results of tests indicate at least three beetles passed. One root mining beetle deposits its eggs in the lower stems and the larvae destroy the nutrient source for leaves by feeding on root tissues. Two others feed on the leaves. These beetles also appear to be able to disperse to other populations of purple loosestrife in other regions. Several countries and several US agencies are collaborating on the research.

....Karen L. Fleming, *Fish and Wildlife News*, Fall 1992

Another important, unsung, woman scientist

In 1957, Maria Wilman died at age 90 near the most southern point in Africa. Her death was unnoticed in the US but her contributions can be seen in rangeland improvement projects in Arizona, Oklahoma, Texas, and Mexico. Her Bachelor's and Master's degrees from Cambridge in 1888 and 1893 were in geology, mineralogy, chemistry and botany. She worked at the South African Museum in Capetown, then was the first director of the Alexander McGregor Memo-

rial Museum in Kimberley. She traveled by ox-wagon to Basutoland (currently Lesotho and Bechuanaland (currently Botswana) collecting, studying and recording Bushman art and culture. Her pre-historic —collections and texts on them—are among the most important of their kind. In addition, she grew succulents, native trees, and shrubs, and approximately 200 grass species collected from all parts of Africa. From these, she collected seed, and seed exchanges were made with botanists in America, Australia, and England. In 1932, for example, Wilman sent Lehmann lovegrass (*Eragrostis lehmanniana*) from Griqualand West to F.J. Crider at the Boice Thompson Arboretum in Superior, Arizona who began the testing and dispersal of seed. Today, it can be found all over the southwest. She also collected weeping lovegrass (*Eragrostis curvula*) and sent it to Crider at about the same time. By 1980 it was established on approximately two million acres in western Oklahoma and north western Texas. The same results were obtained with kleingrass (*Panicum coloratum*). Buffelgrass (*Cenchrus ciliaris*) also was obtained from Wilman's southern and north eastern African collections. Many other botanical discoveries bear her name. She was awarded honors and testimonials from South Africa, but the United States also owes a great deal to this woman pioneer in science.

....Jerry R. Cox, *Rangelands*, October 1992

A really billig sandbox

Second only to the dunes of North Africa's Sahara Desert in size, the Killpecker Sand Dunes harbor plenty of wildlife. Unlike the Sahara, however, these dunes are a mile above sea level in southwestern Wyoming. The sands seem to writhe in a slow motion dance with the mighty, constant winds. Such winds first began scraping the earth to create the dunes 20,000 years ago near the end of the last glacial age. Some of the dunes soar 150 feet high. From the air, the Killpecker resembles a snake trailing 100 miles nearly straight west and east, 3 to 13 miles wide, pockmarked by waterholes and scarred by the crude roads dune buggies make. The Bureau of Land Management wants to preserve from humans at least part of the 170 square miles to protect the dune community: Desert elk, antelope, Jerusalem crickets, spadefoot toads. There are freshwater ponds (left over from winter snow) hosting salamanders and freshwater shrimp and white, eyeless Junebugs with big stingers. It is also an active gas field, so pipelines poke out here and there. The proposed Wyoming Public Lands Wilderness Act includes protection for the dunes which would provide money to enforce against hunters, too much traffic, and oil and mineral development.

....Matt Krahn, *Lewiston Morning Tribune*, January 7, 1993

How environmentally friendly is the marine aquarium hobby?

Intensive exploitation of hundreds of species of marine fish and invertebrates during the last decade, and the more recent extraction of "live rock"—their natural habitat, for commercial purposes in the marine aquarium trade, have become controversial issues among marine biologists, the scientific community, environmentally oriented groups, aquarium hobbyists, and the general public. The use of sodium cyanide, the most environmentally unfriendly method of collecting fish for the aquarium trade, continues to contribute to the rapid degradation of coral reefs in the Philippines and has now spread to Indonesia.

It is well known that thousands of fish perish at the time of collection through cyanide poisoning. Other die in transit to the importer country or at the importer holding facilities. Close to 900 species of marine fish and 300 species of invertebrates are being caught all over the world for the marine aquarium trade. A high percentage, more than 70 percent, became target species and their overcollection over the years has led to depletion of some populations in specific areas of the Philippines.

....Jaime Baquero, *Sea Wind: Bulletin of Ocean Voice International*, July-September 1992.

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(301-897-8616; FAX 301-897-8096).

There is a call for papers and posters (deadline November 1, 1993) for the Symposium on Society and Resource management to be held in June 1994 at Colorado State University, Ft. Collins. For abstract and poster information contact Michael J. Manfredo, Program Chair, Human Dimensions in Natural Resources Unit, CSU, Fort Collins CO 80523.

The Association for Women in Development will hold its 6th International Forum October 20-24, 1993 in Washington DC. They are asking for papers, panels, posters, cultural activities to be submitted by April 15th. Call Norge Jerome, 913-962-9020, or FAX 913-962-0925 for information.

If you are traveling abroad this summer, be aware that many countries now require HIV/AIDS testing in order to obtain visas.

The Arbor Day Institute is conducting a number of urban forestry sessions of their National Urban Forestry School. Some are regularly scheduled. For session materials and dates, write them at PO Box 81415, Lincoln, Nebraska 68501-1415 (402-474-5655).

The Canadian Forestry Association is sponsoring their first Urban Forests Conference, May 31-June 2, 1993 in Winnipeg, Manitoba. For more information contact them at 185 Somerset St

West, Ste 203, Ottawa, Ontario K2P OJ2 CANADA.

The National Urban Forest Conference will be held September 14-18, 1993 in Minneapolis/St. Paul Minnesota. Contact them at PO Box 2000, Washington DC 20013-2000.

Throughout the world, the public has demanded more say in decisions made by the government, industry, and the service sector. To discuss how this demand is shaping our world, the International Association of Public Participation Practitioners (IAP3) is holding *Kananskis '93: Crossing Paths* August 30-September 1, 1993 near Banff, Alberta. Members design and conduct public participation programs. Through its speakers, group discussions, workshops, and trade fair, the conference offers attendees the latest trends and practical developments in public involvement. Contact them at 8th Floor, 9942 - 108 St., Edmonton, Alberta CANADA T5K2J6 (403-427-5598).

Research Associate applications are available at the Five College Women's Studies Research Center, founded in 1991. Amherst, Hampshire, Mount Holyoke and Smith Colleges, and the University of Massachusetts have the largest combined women faculty concentrations in the country. To receive information about the program, call 413-538-2275; fax 2082.

This year, the *Summer Institute for women in higher educa-*

tion administration will be held June 27-July 23, 1993 on the Bryn Mawr Campus. For information write HERS Mid-America, Colorado Women's College Campus, University of Denver, Denver CO 80220 (303-871-6866).

Mathematicians concerned about the different experiences of women students and faculty have prepared a *Skit Kit of Micro-Inequities Experienced by Women in Mathematics* which dramatizes subtle and not-so-subtle behaviors women face daily. They are funny skits, easy, and good for men and women alike. There are other resources in the kits. Send \$4 to the Committee on Participation of Women, Math Assoc. of America, 1529 18th St NW, Washington DC 20036.

Skipping Stones, a children's quarterly based in Eugene, Oregon, focuses on environmental and cultural issues. The journal is searching for an intern for the summer to work 20-25 hours a week. The stipend is \$600 for the 10 week period. If you are interested, contact Arun Narayan Toke, Editor, PO Box 3939, Eugene, Oregon 97403 (503-342-4956).

The International Society of Tropical Foresters (ISTF) is open to members from any country. ISTF sponsors workshops, publishes a quarterly newsletter (English and Spanish), and a membership directory. For membership fees, call them at 301-897-8720.

Gender analysis in agriculture and natural resource management: a technical short course will be held June 7-10, 1993 at the International Training Division: Institute of Food and Agricultural Science at the University of Florida. The course is designed for university, government, and consulting staff who are engaged in development projects overseas. For information call 904-392-3166 or FAX 904-392-3165.

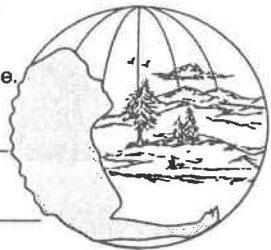
Integrating timber and wildlife on forested lands: on-the-ground applications is the title of the Western Forestry and Conservation Associations conference September 13-14, 1993 in Portland, Oregon. Looking for ways for timber harvesting and wildlife populations to co-exist is the purpose. Call Christy Dorsey at 503-226-4562 for information.

The Girl Scouts are looking for women to be role models who have experience in energy/minerals (geologists, mining or petroleum engineers, or related minerals professionals) to work as volunteers for a week at Camp Elliott Barker, Eagle Nest, New Mexico. Volunteers will work under BLM leadership. The goal is to educate young women about career paths and to teach them about national energy policies and environmentally sound resource management. For information, call Stu Carlson (801-539-4244) or write BLM Minerals Outreach (910), 324 S. State, Ste 300A, Salt Lake City, Utah 84111-2303.

The American Fisheries Society will hold its national meeting in Portland, Oregon, August 30 to September 3, 1993. For information on papers, housing, or registration, contact AFS, 5410 Grosvenor Lane, Ste 110, Bethesda, Maryland 20814-2199

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