National Park Service
U.S. Department of the Interior

NLC*Journal*

Report of the May 8-10, 2007 Meeting of the National Leadership Council

The National Leadership Council (NLC) convened May 8-10, 2007 in Washington, D.C. for its second meeting under the leadership of Director Mary Bomar. Joining the NLC on May 8 were five former National Park Service (NPS) Directors.

Tuesday, May 8, 2007
Agenda

I. Welcome and Call to Order
   Mary Bomar, Director

II. National Park Centennial Challenge
   Steve Whitesell, Centennial Challenge Coordinator
   Kate Richardson, Superintendent, San Francisco Maritime NHP
   Jennifer Mummart, Special Assistant to the Director

III. Remarks from Vin Cipolla, President and CEO of the National Park Foundation

IV. Job Corps
   Chris Jarvi, Associate Director, Partnerships and Visitor Experience
   Kate Stevenson, Acting Assistant Director, Business Services

V. Wreath Laying – World War II Memorial

I. Welcome and Call to Order

Director Mary Bomar called the meeting to order at 8:00 am with a warm welcome to all of the NLC members and Former NPS Directors. She then delivered the following remarks:

"Good morning… It is good to see you all again and wonderful that so many of our former Directors could join us today.

In what now may become a tradition for my remarks at these meetings, I will follow-up my canoe story with another true tale… Last month, my husband Milton and I went dumpster diving…

As you all know, we recently moved from an apartment to a town home in Virginia, and you also know the vast number of knickknacks, boxes and other household items associated with a relocation. Milton and I are true veterans, after a combined military and Park Service career!

Well, as I was putting some of the china and other mementos away in the china closet, I asked Milton about a ceramic piece that had been given to me by my late father... He said, "Gee Mary,

it was with the other boxes I was unpacking," and then he realized that we most likely had tossed out the ceramic with the mass of empty boxes.

There was only on thing to do… we rushed back to the dumpster, which was now quickly filling with trash, and lo and behold, found the ceramic, still intact… Those of you raised Roman Catholic might remember the "Prayer to Saint Anthony" for finding lost objects… I must tell you that it works... right Sandy?

Well, I realized a couple lessons from the experience. First, don't toss the trash until you check for treasures… Second, when we value something highly enough, we will do whatever it takes to keep it. And that is the point of my remarks this morning. If we truly value our parks, our programs and our people, we will do whatever it takes to care for them and ensure they thrive in the months and years ahead.

"Whatever it takes"… the "Big Idea"… or, as I learned at the recent Centennial retreat with the Secretary, "BHAG"…Big Hairy Audacious Goal…. The time has come to think boldly, and I can think of no better people to emulate than those former directors who have joined us today:

Bob Stanton…Long before becoming the National Park Service's first African American director, Bob realized the need for increasing the diversity of the service's staff and public programs to better serve minority populations… One result was the Underground Railroad Network to Freedom….

Roger Kennedy… was especially concerned about expanding the service's educational role and moved to enlarge its presence beyond the parks via the Internet… I do not think we could conceive of how different it would be for our parks, programs and visitors had Roger not led us forward in using the "new" web technology.

Jim Ridenour… stressed the importance of working with other government bodies and private entities to protect lands in and outside the system… "partnerships" are now a way of life for us.

Ron Walker, who advocated "stabilization," foreseeing that NPS funding and staffing would be inadequate for a continuing high influx of new parks and program responsibilities. Today we call it sustainability.

And speaking of executing big ideas and the NPS Centennial… Gary Everhardt oversaw a huge boost in park development and interpretive programming for the bicentennial of the American Revolution…

And how can I speak of achievements without mentioning George Hartzog, who welcomed 70 new areas to the national park system during his nine-year tenure as director and enlarged the service's role in many areas, including urban recreation, historic preservation, interpretation, and environmental education.

Those who have gone before us have left their mark on our Service and on our nation… now it is up to the rest of us to follow their lead, and do whatever it takes to move forward."

II. National Park Centennial Challenge

The National Park Centennial Challenge session was led by Steve Whitesell, Centennial Challenge Coordinator, Kate Richardson, Superintendent, San Francisco Maritime National Historical Park, and Jennifer Mummart, Special Assistant to the Director. Participating with the

NLC in this session were former directors Stanton, Kennedy, Ridenour, Walker, Hartzog, and Everhardt, and former Deputy Director Galvin.

The session began with a powerpoint overview of the process which led to the development of five key themes for the Report to the President. Included were the forty plus listening sessions, on-line and written public and employee comments, program management review, analysis of comments by a think tank group that consisted of NPS field employees and managers, and a listening session for partners hosted by Secretary Kempthorne. The five themes identified were Stewardship, Education, Recreational Experience, Environmental Leadership, and Professional Excellence. Mr. Whitesell informed the group that the Centennial Team was now working on modifying the theme statements and developing specific goals and targets for inclusion in the Report to the President which was due on May 31, 2007. He then opened the floor for discussion.

Director Bomar requested input from each of the former NPS directors that were present at the meeting.

Former Director Jim Ridenour spoke first, noting how quickly things have changed considering he was the first NPS director to use email. He emphasized the need to partner with state and local governments and share responsibilities where possible; stated that NPS should be careful not to dilute its efforts, emphasizing that we should concentrate on what is truly important to the mission; and concluded by recommending that NPS do something for its employees to provide education and instill pride.

Former Director Bob Stanton stated that there is still a need for internal agreement on the definition and scope of the duties of the NPS. Based on the presentation, it was not clear to him that Land and Water Conservation Fund (LWCF), Historic Preservation, Tribal Relations, and International Programs were included in the planning for the Centennial. He added that the lead statement of the Organic Act includes “promote and regulate,” and recommended that NPS not forget this part of it mission and reach out to diverse communities.

Former Director George Hartzog emphasized that the greatest majority of people who need parks, including the elderly, underprivileged, and immigrants, live in urban centers. He called upon the NPS to reach out and include these groups.

Kate Richardson informed everyone that the think tank had discussed the need to engage diverse audiences including the elderly and recent NPS retirees. She added that the Centennial Team is working on how this idea is conveyed in the Report to the President.

Former Director Roger Kennedy stated that it is important for the NPS to train ourselves to be open and willing to change. He recommended that we learn about state and local government operations so that we are better able to work together, and acknowledged the importance of educating employees.

Director Bomar informed the former directors that the thrust of the next two years is on employee development and recognition. She also discussed a new handbook that was developed through the Natural Resources, Stewardship, and Science Associateship that will be distributed at all naturalization ceremonies on NPS lands. The first distribution of the handbook will be at Jefferson National Expansion Memorial on June 14, 2007.

Former Director Gary Everhardt brought the idea of a Museum of National Parks, which would focus on NPS heritage and culture, to the attention of the NLC. He also commended NPS for the efforts to date on the Centennial and applauded the focus on employees.

Former Deputy Director Deny Galvin brought up the importance of external programs, noting that they had been attenuated to "next to nothing" over the past several years. He encouraged the NPS to pay attention and to try to revitalize external programs through the Centennial efforts.

Former Director Bob Stanton concurred with Mr. Galvin's recommendations and noted that a lot of people relate more closely to our external programs than to the parks.

Director Bomar informed the prior directors that when the budget was discussed, she turned to the regional directors and superintendents who emphasized the need for operational funding. The proposed FY'08 budget addresses this need by providing $109 million for base increases at 131 parks.

Former Director Ridenour added that it was up to NPS to challenge state and local parks to live up to their responsibilities, but that he would like to see the Land and Water Conservation Fund be stronger.

Director Bomar responded by letting the former directors know that the next NLC meeting will include joint sessions with the National Association of State Park Directors. Comptroller Bruce Sheaffer added that the NPS cannot neglect park operations. Once park operations are funded, then NPS can address other programs such as LWCF. Regional Director Jon Jarvis concurred that the NPS needs to focus on operations first, but then should shift focus to external programs including LWCF, Heritage Programs, and Urban Park and Recreation Recovery (UPARR). Mr. Sheaffer noted that OMB has added a provision to the proposed FY'08 budget that it can only be used for park projects and programs. This does not include external programs, employee education, etc. Mr. Whitesell encouraged everyone to remember that this is a ten-year initiative and we are just looking at year one right now.

Former Deputy Director Galvin stated that the vision for 2016 should be a fully funded and effective NPS by 2016. He noted that only one-tenth of one percent of the federal budget is devoted to land management and encouraged NPS not to set their sights too low. He added that the NPS budget quadrupled during the eleven years leading up to Mission 66.

Regional Director Pat Hooks commented on the importance of the listening sessions and the need to continue to engage the public and listen to their ideas. She told the group that a representative from Coca-Cola attended the Atlanta listening session and thanked the NPS for the opportunity to provide input. The representative also indicated a desire to work with the NPS to combat obesity and promote health and fitness.

Regional Director Mike Snyder recommended that the report define the "National System of Parks" as being all-inclusive and that this term be used. He also recommended that business practices be included in the Professional Excellence section of the report.

Mr. Whitesell then briefed the group on the proposed next steps which included completing and rolling-out the Report to the President by May 31; developing criteria and vetting proposed Centennial Projects and Programs; preparing a template for park specific Centennial Initiative Implementation Strategies which must be completed by August 25; and announcing the FY'08 Centennial Projects on August 25.

There were several questions about the Centennial Initiative Implementation Strategy that each park must prepare. Mr. Whitesell instructed the NLC that further guidance about the strategies would be issued and that a template would be provided. He also indicated that the strategies should be broad, consistent with park planning documents, and no longer than five to ten pages.

Mr. Snyder expressed concern that larger parks will have an advantage over small parks in the Centennial Challenge, and noted that capacity was needed at the regional level to help small parks raise matching funds. Director Bomar stated that resource sharing is key to the success of the NPS and added that she felt that regional and program offices need to "step up" to assist small parks.

UPDATE: The Report to the President, entitled "The Future of America's National Parks" was delivered on May 31, 2007. It is available online at www.nps.gov/2016.

III. Remarks from Vin Cipolla, President and CEO, National Park Foundation

Mr. Cipolla thanked the NLC for allowing him to come to the meeting and provide an update on the National Park Foundation (NPF). He noted that the NPF has transitioned from corporate to individual fundraising, and is anxious to assist the NPS in the Centennial Challenge efforts. Mr. Cipolla noted that web site development needs more focus, which is something NPF is working on, and he informed the NLC that NPF has recently hired Ms. Loretta Cooper to work in the Development Department. In closing, Mr. Cipolla listed the following as accomplishments under his tenure:

- The NPF has raised $20 million in cash.
- The NPF endowment has increased by $4 million.
- The friends group model was changed from building specific friends groups to supporting all friends groups.

IV. Job Corps

Associate Director Chris Jarvi and Acting Assistant Director Kate Stevenson provided the NLC an overview of the current status of the Job Corps Centers located on NPS lands. Concerns have been expressed over the recent closure of the Oconaluftee Center by the Department of Labor. The NPS goal is to re-open the center and maintain the positions. The Department of Labor will be taking over all of the contracts; however, they will not assume responsibility for the employees. The US Forest Service has offered to take control of the centers and the employees. So far, there has not been a response from the Department of Labor. NPS will continue to work on possible solutions.

UPDATE: Over the past several months, the National Park Service (NPS) has been in discussions with the Department of Labor (DOL) about transitioning the operation of the three NPS Job Corps Centers to an entity that could better manage the centers. Based on several developments, including DOL's recent instructions to potential contractors to visit the Great Onyx Job Corps Center (KY) on June 5, 2007 to prepare for bidding on a contract for operations, the NPS has realized the need to correct or clarify certain past statements and address certain misunderstandings between DOL and NPS. The NPS goal is to put deliberations concerning the Job Corps Centers on a more productive track for the benefit of all concerned.

One recent development that affects this process is a directive from the Office of Management and Budget (OMB) that DOL, the Department of Agriculture, and the Department of the Interior develop an umbrella agreement to supersede the current Interagency Agreement. OMB has specifically stated that there will be no side agreements prior to development of the multi-department agreement. Once the agencies develop the umbrella agreement, DOL and NPS will have clearer direction on the content of site-specific operational agreements. Through this more deliberative process, DOL and NPS will be better able to address the issues of importance to each agency. From the NPS viewpoint, these issues include maintaining an emphasis on

conservation-related training, securing management competent to carry out the conservation mission, clarifying requirements that apply to use of parkland, and taking appropriate response.

The following steps have been taken to date:
The NPS has cancelled all agreements for the Oconaluftee Job Corps Civilian Center (OJCCC) to include the Cherokee Boys Club and the ResCare contracts.

The NPS drafted a legal document, which will allow the DOL to operate the OJCCC starting September 1, 2007. The document is consistent with the current 1988 Interagency Agreement between DOI and DOL. Formal negotiations will began with DOL on the document on July 5th.

The NPS has transmitted to DOL a draft special use permit to allow the DOL contractor's access to the OJCCC for the purposes of making needed improvements to the facilities to allow reopening of the Center in time for the September 1, 2007 opening.

The NPS will provide funding to continue the current level of operation with the existing thirteen NPS staff from July 1, 2007 until September 1, 2007, or until our employees are relocated to another job or terminated by a RIF action. NPS employees at the Oconaluftee Center will continue to receive regular updates from the NPS regarding progress in out-placement services and the status of a RIF, which is the option of last resort.

The NPS is working through the DOI Office of Property and Acquisition Management to develop a new Interagency Agreement that covers the operations and maintenance of all centers operating on DOI and USDA land. The goal is to reach agreement by December 31, 2007.

This is an ongoing issue which will require continued attention from the NLC.

V. Wreath Laying – World War II Memorial

The NLC attended a wreath laying at the World War II Memorial on the afternoon of May 8. Director Bomar and Secretary Kempthorne joined Her Majesty Queen Elizabeth II, His Royal Highness Prince Philip, Duke of Edinburgh, President George H.W. Bush, Mrs. Barbara Bush, Major General Guy Swann, and Major General John Gilchrist for the ceremony which commemorated Victory in Europe Day (VE-Day) and honored the lives lost during the War. After the ceremonial wreath laying, Director Bomar conducted a tour with Her Majesty and Prince Phillip and the official party around the World War II Memorial and greeted the veterans in attendance. The Queen also met with British war brides who married U.S. soldiers more than 60 years ago. Director Bomar also conveyed her sincere thanks and appreciation to Regional Director Joe Lawler and the staff of the National Mall and Memorial Parks.

Wednesday, May 9, 2007
Agenda

I. Welcome and Call to Order
   Dan Wenk, Deputy Director

II. National Park Centennial Challenge
   Steve Whitesell, Centennial Challenge Coordinator
   Kate Richardson, Superintendent, San Francisco Maritime NHP
   Jennifer Mummart, Special Assistant to the Director

I. Welcome and Call to Order

Deputy Director Wenk called the meeting to order at 8:30 am and informed the NLC that Director Bomar had been called into a meeting with Secretary Kempthorne and Chief of Staff Brian Waidmann. Before joining the NLC, Director Bomar was also stopping at a reception in honor of the NPS employees who were receiving awards at the DOI Honor Awards Convocation to offer her congratulations. Deputy Director Wenk then stated that the NLC had been asked by Secretary Kempthorne and Chief of Staff Brian Waidmann to work on the themes, goals, and performance statements for the Centennial Challenge Report to the President.

II. National Park Centennial Challenge

The NLC spent the entire day on May 9 working on the Centennial Challenge report to refine the themes, goals, and performance statements. They broke into five groups for several sessions, and then reported back to receive feedback. The NLC also had the chance to meet with Secretary Kempthorne, who came to the meeting to thank the NLC for their assistance and get an update on the status of the report. A special thanks goes to John Quinley, Alaska Region Assistant Regional Director for Communications, who synthesized the NLC ideas into concise statements the evening of May 9.

UPDATE: The completed report, entitled "The Future of America's National Parks," can be found at www.nps.gov/2016.

Thursday, May 10, 2007
Agenda

I. Welcome and Call to Order
   Dan Wenk, Deputy Director

II. Human Capital PPE
   Marcia Blaszak, Regional Director, Alaska Region
   Jerry Simpson, Assistant Director, Human Capital
   Rob Gordon, Manager, Competitive Sourcing Program

III. Safety
   Karen Taylor Goodrich, Associate Director, Visitor and Resource Protection
   Cicely Muldoon, Deputy Regional Director, Pacific West Region
   Louis Rowe, Risk Manager, Washington Office
   Scott Wanek, Regional Chief Ranger, Pacific West Region
   Chas Cartwright, Superintendent, Shenandoah National Park
   Mike Reynolds, Superintendent, Fire Island National Seashore

IV. Budget
   Bruce Sheaffer, Comptroller

V. Human Capital Survey
   Nathaniel Deutsch, Human Resources Manager, Washington Office
   Charles Richardson, Chief of Classification and Compensation, National Capital Region

VI. Climate Change
   Mike Soukup, Associate Director, Natural Resources, Stewardship, and Science

VII. Closing Remarks
   Mary Bomar, Director

I. Welcome and Call to Order

Deputy Director Wenk called the meeting to order at 8:30 am and informed the NLC that Director Bomar had been called into a meeting with Secretary Kempthorne and Chief of Staff Brian Waidmann. After that meeting, Director Bomar had a scheduled appointment with John Nau, Chairman of the Advisory Council for Historic Preservation, and Jim Lighthizer, President, Civil War Preservation Trust, to discuss the Civil War Preservation Trust, Preserve America, Civil War Battlefields, and an NPS Programmatic Agreement. She joined the NLC at 9:30 am. Deputy Director Wenk then turned the floor over to Chief of Staff Sue Masica. Ms. Masica thanked the NLC for their flexibility yesterday, and then announced the agenda for the final day of the NLC meeting.

II. Human Capital PPE

Regional Director Marcia Blaszak, Assistant Director Jerry Simpson, and Competitive Sourcing Manager Rob Gordon provided the NLC with an update on the Human Capital PPE. Last spring, NPS began the Preliminary Planning Effort (PPE) on Human Capital functions. The goal was to get a better picture of needs, as well as the capacities throughout all of Human Capital. The first phase of the three-phase PPE process concluded in January, and based on the recommendations from the steering committee, the NLC decided that it would be in the best interest of the NPS to move forward with a Competitive Review of Human Capital functions and activities identified in the report: writing and classifying position descriptions; handling time and attendance cards and payroll processing; administering and communicating benefits programs, processing benefits actions; and processing SF50s, maintaining OPFs, medical records, and employee performance files. These four areas cover 122 FTE. The report for the first phase also recommended that NPS pursue resource-sharing and reduction in Servicing Personnel Offices (SPOs), and that NPS invest in automation for processes that are currently done manually.

A Competitive Review process in these limited areas supports the goals of the President's Management Agenda and benefits the National Park Service by committing to responsible change through a structured and recognized process that has both internal and external transparency. The process is expected to take approximately twelve months.

The NLC had a lengthy discussion about the Competitive Review process and the other recommendations from the Phase One report. Several concerns were voiced including that there are a lot of suppliers (both federal and private) that will likely bid during the competition, NPS needs to know and disclose the cost implications before competition gets underway, automation needs to happen sooner rather than later to ensure that NPS is working as efficiently as possible, and the activities listed are often collateral duties for employees, and therefore represent fractions of FTEs. NLC members also discussed the importance of resource sharing, and acknowledge that this may need to occur outside of regional boundaries in the future.

The NLC approved teams to oversee the Performance Work Statement (PWS) and Most Efficient Organization (MEO) development, both critical parts of the Competitive Review Process. Names of team members are listed in Appendix C. The PWS will allow NPS to specify what service must be provided in specific locations, and will allow the government to commit to furnish certain services that will not need to be addressed in the competition.

<u>Action Items:</u>

- Assistant Director Simpson will send information to the Regional Directors within the next 2-3 weeks about SPOs. Each SPO will need to have 3-4 licensees on site.
- The Regional Directors will determine the desired number of SPOs for their regions and submit this determination to Mr. Simpson by June 30, 2007. It was acknowledged, however, that a decrease in the number of SPOs cannot happen until Official Personnel Folders (OPFs) are automated. (Electronic OPFs will be part of an upcoming mandate from OPM and DOI.)
- Assistant Director Simpson will send guidance to the NLC on how to cull OPFs by early July.
- The Steering Committee will prepare a transition cost project and report this back to the NLC.

III. Safety

Associate Director Karen Taylor Goodrich, Deputy Regional Director Cicely Muldoon, Risk Manager Louis Rowe, Regional Chief Ranger Scott Wanek, and Superintendents Chas Cartwright and Mike Reynolds briefed the NLC on safety, and requested concurrence on the formation of a Safety Leadership Council. They reviewed current statistics, and the NLC discussed line-of-duty fatalities. While there has been a 13% downward trend in injuries and illnesses, safety remains at the forefront for all NPS employees, especially with the most recent line-of-duty fatality, Marina Giggleman.

The NLC had an open discussion about leadership and management system failures that have led to accidents and fatalities over the years. They stressed the importance of everyone playing an active role in their safety and the safety of employees and co-workers. "After all our talk about Natural and Cultural Resources, we sometimes fail to emphasize the 20,000 men and women who take care of America's special places." (Director Bomar, January 2007)

Director Bomar encouraged the NLC to perform safety walk-arounds and send out frequent safety messages to employees. Regional Director Snyder noted that Intermountain Region is using leading indicators to evaluate safety, adding fifteen roving safety professionals, and conducting safety walk-arounds. Anything noted as deficient in the walk-around must be remedied within three weeks. The NLC noted that Superintendents and Regional Directors must have the authority to immediately activate a safety stand-down if conditions warrant, as there is often not time to go through a rigorous approval process.

The NLC agreed to form a Safety Leadership Council that will report back to the NLC at each meeting. The vision for the council is to "transform safety from a discrete program to a leadership practice throughout the NPS." Associate Directors Karen Taylor-Goodrich and Mike Soukup and Regional Directors Jon Jarvis and Mike Snyder will serve on the Council. Additionally, the NLC decided to send a letter to the field detailing the service's recommitment to safety.

<u>Action Item</u>

- A letter to the field detailing a recommitment to safety and the formation of the Safety Leadership Council will be drafted, signed by all voting NLC members, and distributed. – COMPLETED

The memo from Director Bomar about the establishment of the Safety Leadership Council, the council's charter, and a list of council members are in Appendix D.

IV. Budget

Comptroller Bruce Sheaffer led a discussion regarding the 2008 and 2009 budgets with the NLC. He was optimistic that NPS will receive much of what was requested in the President's proposed 2008 budget that was sent to Congress. The NLC were then engaged in a conversation about priorities for FY 2009 to ensure that they were in agreement on proposed funding levels. Mr. Sheaffer will use the guidance provided by the NLC to help formulate the proposal for the NPS FY 2009 budget.

Action Items

- Mr. Sheaffer will include funding for the Underground Railroad Network to Freedom as the NLC concurred that this program should be funded.
- Associate Director Taylor-Goodrich will send information to Mr. Sheaffer regarding funding needs for Incident Management Teams.
- Regional Director Blaszak will submit information to Mr. Sheaffer about the travel ceiling.

V. Human Capital Survey

In 2006, the Office of Personnel Management (OPM) conducted a Federal Human Capital Survey. Director Bomar and the NLC were concerned about the results from this survey and asked the Human Capital Survey Team to review the results and make recommendations. Mr. Nathaniel Deutsch, WASO Human Resources Manager, and Mr. Charles Richardson, NCR Human Resources Manager and team co-lead, briefed the NLC on the team's findings.

The OPM survey consisted of 73 questions covering Personal Work Experience; Recruitment, Development and Retention; Performance Culture; Leadership; Learning; Job Satisfaction; and Satisfaction with Benefits. Responses to the questions in 2006 were compared to those given in 2002 and 2004. Based upon the trends observed, the team made the following recommendations to the NLC:

- Ensure that the survey is accessible to all employees. Only 6,648 of the 20,000 NPS employees took the survey.
- Continue to fund NPS Fundamentals.
- Resuscitate the annual Service-wide training needs assessment.
- Ensure that supervisory training is multi-tiered and appropriate for the level of complexity and responsibility of the trainee.
- Ensure that NPS has a vigorous training program for its employees.
- Create permanent base-funded career counselors.
- Develop NPS career employees for senior leadership positions.
- Conduct TEL-NET broadcasts semi-annually to all employees to improve internal communications.

The NPS discussed the recommendations from the team as well as their issues and concerns regarding the survey. There was broad agreement on many of the recommendations, but there was some concern regarding base-funded career counselors. Alternatives discussed included assigning new superintendents a senior superintendent mentor, creating a database of senior level supervisors who are willing to serve as mentors, and enhancing the function of career counseling rather than creating new positions. The NLC agreed to review the recommendations in depth and provide comments to Jerry Simpson by Wednesday, May 16, 2007.

Many NLC members felt that the survey was much too long and took too much time to complete. They also noted that at the time this survey was given, NPS was dealing with the 2006 Management Policies and potential outsourcing. The NLC recommended that the team

speak to Dr. Jim Gramman, NPS Visiting Chief Social Scientist, and ask him to review the survey questions.

Action Items:

- The NLC will submit their comments on the team's recommendations to Jerry Simpson by COB, Wednesday, May 16, 2007.
- Nathaniel Deutsch and Mike Soukup will speak with Dr. Jim Gramman about the survey and ask him to work with OPM and DOI.

VI. Climate Change

Dr. Leigh Welling, Director, Research Learning Center, Glacier National Park, provided the NLC with an overview of climate change that highlighted changes that are occurring and presented ideas for actions that can be taken by NPS. She informed the NLC that six of the warmest years over the last century have occurred in the last eight years, and the latest assessment report from the Intergovernmental Panel on Climate Change noted that "warming of the climate system is unequivocal" based on observations of increases in global average temperature, widespread melting of snow and ice, and rising global mean sea level. Impacts of climate change include changes in precipitation, rising seal level, insect outbreaks, forest pathogens, decreased lake levels in the southwest, changes in the timing of seasons, and changes in the elevational ranges of terrestrial species.

Dr. Welling urged the NLC to incorporate climate change into planning documents, to engage in scenario planning, and identify high risk species and habitats such as those in alpine, aquatic, high latitude, and transitional environments. She also advocated for long-term monitoring, engaging partners and citizens, promoting transportation alternatives, reducing greenhouse gas emissions, and training and education for park employees and visitors.

Dr. Mike Soukup, Associate Director, Natural Resources, Stewardship, and Science, informed the NLC that Secretary Kempthorne has convened a Climate Change Taskforce that is chaired by Deputy Secretary Scarlett. The NPS is an active participant on this Taskforce and is represented on all three subcommittees - legal and policy issues, land and water management, science. The legal and policy issues subcommittee is reviewing current practices for considering climate change effects in land-use planning and decisions. The land and water management subcommittee is evaluating current and prospective options for addressing the effects of climate change, and is cataloguing the types of impacts relevant to our lands and waters. The science subcommittee is looking at regional scale modeling to better project location specific changes to the landscapes we manage, and is evaluating information needs.

Testimony and prepared statements from the April 26, 2007 Hearing Before the Subcommittee on Interior, Environment, and Related Agencies of the Hose Appropriations Committee are in Appendix E.

VII. Closing Remarks from Director Bomar

"I suppose this meeting proved the old maxim, 'The only thing constant is change.'

I truly thank you all for your understanding, cooperation and contributions to our Centennial Report to the President… The Centennial Initiative will be a huge boost to the entire Service…As I said in my 'dumpster diving story,' if we truly value something we will do whatever it takes to achieve it.

I would ask those of you who had members of your team here as presenters to also thank them for their flexibility … And a huge thank you to the Centennial team, Dan and others, who really have worked all hours trying to get the report finished… and neither they, nor the team in Harpers Ferry, are quite finished yet!

I also must thank Sue, who juggled the schedule on the fly, as well as Jim Gasser and Jennifer Lee… you handled it all despite the challenges of a shifting schedule…

Despite the schedule changes, there were clear benefits… first to allow you as the NLC to contribute in a major way to the Centennial report… but equally important was the opportunity to learn for yourselves how deeply committed the Secretary is to our parks and programs with the Centennial Initiative… you can see how much he cares…

While we did not get to all the items on the agenda, we covered an amazing amount of ground… the Human Capital PPE, budget…safety…the Human Capital Survey… climate change, and more…

I especially thank you all for stepping up to the plate on Safety… Jon and Mike as RDs and Mike Soukup joining Karen as the Associates on the team… that is a clear indication of our commitment to a stronger safety program…

The other items on the agenda are also important… Yes it is disappointing we did not get to the Training and Development report… but that gives Sandy, Costa and company a chance to go back and make it even better!

This really is a time for our people, and I heard that from this Council during all our discussions... not just for your regions, or Associateships, but for our Service... I believe we are on the right track as a team…and the NEXT employee Survey will show that!

So, thank you all for a great three days…for me, the whirlwind continues at Jamestown Friday and Saturday… But I know it is the same for all of you… and to recall my canoe story, we are all rowing as hard as we can…

Have a safe journey home... and I underscore the word safe! Thank you all!”

Next meeting

September 4-6, 2007 Williamsburg, VA

Appendix A

List of National Leadership Council Members (updated March, 2007)

Voting Members
Mary Bomar, Director
Dan Wenk, Deputy Director, Operations
(Vacant) Deputy Director, Support Services
Sue Masica, Chief of Staff
Bruce Sheaffer, Comptroller
Chrysandra Walter, Acting Northeast Regional Director
Ernest Quintana, Midwest Regional Director
Mike Snyder, Intermountain Regional Director
Marcia Blaszak, Alaska Regional Director
Pat Hooks, Southeast Regional Director
Jon Jarvis, Pacific West Regional Director
Joe Lawler, National Capital Regional Director
Bill Shaddox, Acting Associate Director Park Planning, Facilities & Lands
Mike Soukup, Associate Director Natural Resources, Stewardship & Science
Jan Matthews, Associate Director Cultural Resources
Karen Taylor-Goodrich, Associate Director Visitor & Resource Protection
Chris Jarvi, Associate Director Partnerships and Visitor Experience

Standing Staff Members
Dave Barna, Chief, Public Affairs
John Snyder, Acting Chief Information Officer
Tom Wolfe, Assistant Director—Congressional and Legislative Affairs
Kate Stevenson, Acting Assistant Director—Business Services
Jerry Simpson, Assistant Director—Human Capital
Phil Sheridan, Acting Associate to the Director

NLC Support Staff
Jennifer Lee, Administrative Program Specialist
Jim Gasser, Program Specialist

Appendix B

Agenda Items for upcoming NLC calls and/or the September 2007 NLC meeting:

- Training and Development
- Comments on Human Capital Survey recommendations
- Hunting
- Harpers Ferry Center
- Nationwide Programmatic Agreement for Section 106 Compliance
- Border Issues
- Contracting Red Report
- Status of revisions to partnership construction process and other improvements to facilitate philanthropy and partner engagement with NPS
- Native American plant collecting regulations – findings of the work group and proposed regulations change to be published in the Federal Register.
- Wild and Scenic Rivers – task force recommendations review
- NCR case study: Material Safety Data Sheet (MSDS) business practice change through automation

Appendix C

Human Capital PPE

Performance Work Statement Team
Marcia Schramm, HR Specialist (WASO) - PWS Team Lead
Dave Fuller, HR Officer (PWR/OLYM)
Maribeth Wuertz, HR Officer (IMR/YELL)
Helen Stewart, Lead HR Specialist (ARO)
Valerie Marquez, HR Specialist (IMRO)
Keith Newlin, Superintendent (NER/Western PA Parks)

Most Efficient Organization Team
Phil Hechtman, Admin Off. (MWR) – MEO Team Lead
Teresa Wright, HR Specialist (PWR/Seattle)
Lindy Lawson, HR Specialist (ARO)
Marlene Doty, HR Specialist (NCRO)
Christopher Moos, Superintendent (IMR/CAVO)
Liz McConnell, Chief of Admin. (NER/BLAC)
Cynthia Kretzschmar, Admin Off.(SER/VIIS)
Debbie Burton Orton, Supv. HR Specialist (APC Denver) - Advisor

Appendix D

- Safety Leadership Council Memo
- Safety Leadership Council Charter
- Safety Leadership Council Members

United States Department of the Interior

NATIONAL PARK SERVICE
1849 C Street, N.W.
Washington, D.C. 20240

(0001)

July 10, 2007

Memorandum

To: All Employees

From: Mary A. Bomar
Director

Subject: Establishment of the National Park Service Safety Leadership Council

In April, I had a telephone conversation with Craig Giggleman, whose wife Marina died in an accident at Padre Island National Seashore. I learned much about Marina from speaking to him. She married a wonderful man, had a loving son and followed her life's passion for the ocean and its creatures. She left the land of her birth and followed her passion to a new country she would call home. Her work was important, and it mattered not only to her but to the living biosphere we call Earth. A beautiful life, cut short by a tragic accident.

While the number of accidents in the Service is declining, the severity and frequency of serious accidents remains sobering. We have experienced one on-duty death in the last three months; seven in the past year; and eighteen in the past five years.

During the press of business in our parks, we tend to focus on the problems of today and forget about past accidents at other parks. But during the May National Leadership Council (NLC) meeting, a slide listing the names of our colleagues who died on duty over the past 20 years brought the issue into sharp focus. There were names of people we knew, at parks throughout the system. There could be no better reminder of the need for safety than by seeing their names:

Robert Kasparek	James Spirer	James Hudson
James Laney	Edward Wisniewski	Robert Mahn, Jr.
Ricardo Preston	James Hatfield	Kee Won Kim
Harold Parsens	Anne Dickenson	Fernando Abeyta
William Holland	Charles Avery	Ryan Weltman
Truman James	Steven Milton	Herbert Whitaker
Robert Lewis McGhee	Don Reid	Mathew Lambert
John Ethridge	Alan Quellette	Barry Hance
George MacDougall	Corey Washington	Wesley Fox

Sean Ryan	Steve Makuakane-Jarrell	Ryan Waltman
Philip Otis	Dorie Lent	Susanne Roberts
Randall Thompson	Andy Artz	Daniel Holms
Randy Morganson	Kenneth Smith	Jeff Christensen
Michael Beaulieu	Cale Shaffer	Dan Madrid
Nelson Griffith	Brian Reagan	Jim Schlinkmann
Roderick Hutchinson	Adam Kolff	Joe Sordi
Diane Dustman	Robert Larson	Arnold Kovin Jr.
Rory Perkins	Phillip Conner	Dan Quilter
Taryn Hoover	Kristopher Eggle	George Ratliff
Mike Vanderbeek	Hakim Farthing	Michael Gresham
Ford Mattice	Tom O'Hara	Dan Green
Joseph Kolodski	Matthew Engelhardt	Marina Giggleman
Tim Taggert	Ricky Campbell	
Anthony Carone	Armando Caceres	

Without exception, organizations that have radically improved their safety performance are those in which the highest levels of management have become directly involved in creating and sustaining a culture of safety. These organizations universally exhibit factors common to high safety performance— vision, leadership, accountability, communication, and evaluation. Not surprisingly, these factors are also common to organizations with high overall performance.

Safety must be integrated as a leadership practice and become part of our culture, and not viewed as an isolated program or initiative. A culture change of this magnitude demands vision and credibility from the top down, and will not succeed without the visible commitment of NPS leadership.

A Safety Leadership Council, chartered by and accountable to the NLC, will help the NLC create, deliver, and sustain an effective safety strategy for the Service. An executive level council drawn from field practitioners, park managers, and regional and national leadership will have the credibility and support to transform *NPSafe* into a working blueprint for excellence and help bridge the gap between management vision and front line implementation.

Attached to this memo are a charter, signed by the entire National Leadership Council, and a list of the members of the Safety Leadership Council. I think the clearest indicator of commitment at the national level is that rather than a single NLC representative to advocate for safety, the NLC insisted on four members as representatives: Associate Directors Mike Soukup and Karen Taylor-Goodrich and Regional Directors Jon Jarvis and Mike Snyder. And, because at its core, safety is about people, Jerry Simpson, our Assistant Director for Human Capital, will also participate actively on the council.

We have a promising beginning. A growing body of park managers and field practitioners throughout the Service has instituted progressive, innovative management

systems to instill a safety culture. A Safety Leadership Council will assist the NLC in fostering these efforts to benefit the NPS workforce as a whole.

In our Centennial Report to the President, we choose Professional Excellence as one of our major themes. That includes keeping our workforce and our visitors safe. In this 'Year of the People,' there could be no better gift for us to give one another than a year without further fatalities among our colleagues. Thank you for taking care of one another and for all you do each day.

Attachments: Safety Leadership Council Charter
Safety Leadership Council Members List

NATIONAL LEADERSHIP COUNCIL

SAFETY LEADERSHIP COUNCIL

VISION
Transform safety from a discrete program to a leadership practice throughout the National Park Service.

FOUNDATION
Accident rates in the National Park Service have declined in the last few years, indicating we have made some progress in increasing safety performance. While the safety climate in parks has improved, we can and must do better. Our injury and fatality rate remains unacceptably high for a high performing organization that values its employees as we do in the Service.

The National Leadership Council believes that with leadership commitment and employee engagement, we can succeed in changing the safety culture within the Service. This transformation requires the active engagement of leaders, present and emerging, at all levels of the organization.

ACTION
Establish a servicewide Safety Leadership Council charged with assisting the NLC in creating, delivering, and sustaining an effective safety environment for the NPS. A servicewide council with a shared passion for safety leadership will help guide efforts to transform NPSafe into a working blueprint for excellence and bridge the gap between management vision and front line implementation.

APPROVED

Mary A. Bomar

Christopher Jarvi

Marcia Blaszak

Dan Wenk

Jan Matthews

Patricia Hooks

Sue Masica

Bill Shaddox

Jonathon Jarvis

Karen Taylor-Goodrich

Chrysandra Walter

Ernest Quintana

Bruce Sheaffer

Joseph Lawler

Michael Snyder

Michael Soukup

Safety Leadership Council
Membership

The National Park Service Safety Leadership Council serves as an interdisciplinary advisory forum, a leader in advocating a shift in safety within the Service from a discrete program to a leadership practice. The Council is representative of a range of disciplines and grade levels, including field, regional, and national program representatives and senior executives. The Council will report to the National Leadership Council.

NLC REPRESENTATIVES

Karen Taylor-Goodrich, Associate Director, Visitor and Resource Protection
Jon Jarvis, Regional Director, Pacific West Region
Mike Snyder, Regional Director, Intermountain Region
Mike Soukup, Associate Director, Natural Resources, Stewardship and Science
Jerry Simpson, Assistant Director, Human Capital

SUPERINTENDENTS

Chas Cartwright	Superintendent, Shenandoah
Stephanie Dubois	Deputy Superintendent, Glacier
Karen Gustin	Superintendent, Big Cypress
Mike Reynolds	Superintendent, Fire Island
Kate Richardson	Superintendent, San Francisco Maritime
Alex Romero	Deputy Superintendent, National Capital Parks - East
Tom McGrath	Superintendent, Historic Preservation Training Center
Greg Dudgeon	Superintendent, Sitka National Historical Park

DEPUTY REGIONAL DIRECTOR

Cicely Muldoon	Pacific West

PROTECTION RANGERS

Jill Hawk	Regional Chief Ranger, NER

STRUCTURAL FIRE

Joe Mazzeo	Regional Structural Fire Specialist, NER

WILDLAND FIRE

Al King	Fire Safety & Prevention Specialist, NIFC NPS

FACILITY MANAGEMENT

Michael Castagnetto	Facility Manager, Harpers Ferry

REGIONAL SAFETY MANAGER

Dickie Brown	Regional Safety Manager, MWR

PARK SAFETY MANAGER

Roger Farmer	Safety & Occupational Health Manager, Yosemite

COLLATERAL DUTY SAFETY OFFICER

Sena Wiley	Collateral Duty Safety Officer, Grand Teton

WASO RISK MANAGEMENT

Richard Powell	Risk Management Program Lead
Sarah Newman	Public Safety Specialist
Ed Perez	Occupational Health Manager

COUNCIL SUPPORT

Louis Rowe	Deputy, Risk Management Program
Glenn Dean	Safety Specialist/Training Manager
Steve Hastings	Training Manager, Facilities Management

Appendix E

Climate Change Testimony – April 26, 2007 Hearing Before the Subcommittee on Interior, Environment, and Related Agencies of the Hose Appropriations Committee

- Statement of Dan Kimball, Superintendent, Everglades National Park
- Statement of Don Neubacher, Superintendent, Point Reyes National Seashore
- Testimony of Sam D. Hamilton, Southeast Regional Director, USFWS
- Statement of Ron Huntsinger, National Science Coordinator, BLM
- Testimony of P. Lynn Scarlett, Deputy Secretary of Interior
- Statement of Mike Pellant, Great Basin Restoration Initiative Coordinator, BLM
- Statement of Dr. Thomas R. Armstrong, Senior Advisor for Global Change Programs, USGS

STATEMENT OF DAN KIMBALL, SUPERINTENDENT, EVERGLADES NATIONAL PARK, NATIONAL PARK SERVICE, DEPARTMENT OF THE INTERIOR, BEFORE THE SUBCOMMITTEE ON INTERIOR, ENVIRONMENT, AND RELATED AGENCIES OF THE HOUSE APPROPRIATIONS COMMITTEE CONCERNING CLIMATE CHANGE AND LANDS ADMINISTERED BY THE DEPARTMENT OF THE INTERIOR.

APRIL 26, 2007

Mr. Chairman and members of the subcommittee, I appreciate the opportunity to appear before you today at this hearing on climate change and its impact on lands administered by the Department of the Interior. My remarks will focus on Everglades National Park and the potential effects of climate change on the Everglades ecosystem, the park's infrastructure, and our visitors.

At 1.5 million acres, Everglades National Park is the third largest park in the lower 48 states and protects the largest wilderness area east of the Rocky Mountains. The park includes the largest freshwater sawgrass prairie in North America and the largest protected mangrove ecosystem in the Western Hemisphere. To the members of Congress who debated the park proposal in 1932, Everglades National Park was a new idea: the first national park to be established not as a scenic showplace, but as a biologic marvel.

Everglades National Park is part of the greater Everglades, a 100-mile long, 50-mile wide shallow, freshwater "River of Grass" that historically flowed south from Lake Okeechobee through the freshwater sloughs and prairies to the Gulf of Mexico and Florida Bay. Summer rains flood this river and fuel the reproduction of small fish, algae, and other organisms at the base of the food chain. The winter dry season concentrates this life into ponds and alligator holes that once fed "super-colonies" of wading birds, colonies so large that observers claimed that in flight they blocked out the sun. Where fresh water from the marshes meets salt water at the coast, vast mangrove forests and winding coastal creeks begin. Here, crocodiles and alligators uniquely live side by side. Beyond the mangroves is Florida Bay, a half-million acre estuary made up of shallow basins, grassy mud banks, and mangrove islands. The bay serves as a nesting area, nursery, and feeding ground for lobster, pink shrimp, crocodiles, manatees, turtles, dolphins, and a variety of birds and game fish. As many say, "There are no other Everglades …" The park has also been designated as a World Heritage Site, an International Biosphere Reserve, and a Wetland of International Importance.

The Everglades also serve the people of South Florida. They are a source of drinking water for almost 5 million residents; a giant limestone sponge that helps to absorb the floodwaters from tropical storms and hurricanes; and one of the major engines of tourism for South Florida.

During the last 130 years, the Everglades have been put in peril by a series of water management projects that were conceived with good intentions, but with little understanding of the ecosystem. As a consequence, wading bird colonies have shrunk by 90%. Sixty-nine species of plants and animals have been listed as threatened or endangered by the State of Florida or the Federal government. The ability of the ecosystem to store water – for both people and nature – has been seriously compromised. The existing "plumbing" of South Florida makes it almost impossible to improve conditions for one user of water without harming another.

As you are aware, the Department of the Interior, in partnership with the U.S. Army Corps of Engineers, the State of Florida, and the Native American tribes, has embarked on a 35-year,

$11 billion effort to restore the greater Everglades. As I hope to show later in my testimony, this effort is even more critical in a time of rising seas.

Everglades National Park is very vulnerable to sea level rise. The entire park lies at or close to the level of the sea. Sixty percent of the park is at less than 3 feet above mean sea level. The highest ground in the park is 11 feet above mean sea level. The February 2007 report of the Intergovernmental Panel on Climate Change (IPCC) allowed the park to model the potential impact of sea level rise on its lands and waters. Using six different climate change scenarios, the IPCC report projects that sea level could rise between 7 inches to 23 inches by the end of this century. If this projection proves true, 10% to 50% of the park's freshwater marsh would be transformed by salt water pushed landward by rising seas.

The key to predicting the impacts of sea level rise is knowing the rate at which the water will rise. Sea level has been rising in South Florida since the end of the last ice age, more than 10,000 years ago. Geologic evidence shows that much of the marine area of the park, including Florida Bay and the Gulf Coast, was freshwater marsh 10,000 years ago. Beginning 5,500 years ago, rapidly rising seas (a rate of 9 inches every 100 years) flooded the bay and Gulf Coast and pushed saltwater inland far beyond today's coastline. Approximately 3,200 years ago, the rate of sea level rise dropped to about an inch and a half every hundred years. In this time of slow sea rise, South Florida gained land, including Cape Sable and the Ten Thousand Islands.

The rate at which sea level would rise in the future is an important factor. Past evidence tells us that if sea levels were to rise slowly, mangroves and shallow mud banks might be able to keep pace with the change. If sea levels were to rise rapidly, it is likely that mangrove areas and coastal wetlands would likely not be able to adapt and would be submerged.

What impacts would sea level rise have on the natural systems within the park? Much is unknown and the subject of scientific speculation. Most scientific reports agree that sea level in South Florida has risen by 10 inches since 1930. During that time, we have seen the erosion and collapse of a few coastal creeks. As water eats away at the land, it carries away nutrients that have been locked up in peat and mud soil and makes them available for algae, microscopic organisms that are a normal part of the ecosystem, but that can increase to levels that harm other life if nutrient levels are too high. To date, the impact of coastal erosion has been local and has not threatened the Everglades' ecosystem. But things could change if the rate of sea level rise increases.

A rise in sea level of between 7 and 23 inches, as projected by the IPCC report, would submerge tidal flats and inland freshwater marshes and impact the species that inhabit these areas, such as wading birds and the Federally endangered Cape Sable Seaside Sparrow. If sea level rises 23 inches, it could submerge the park's pinelands, one of the rarest ecosystems in South Florida. Rising sea levels could also erode beaches, leaving fewer habitats for nesting sea turtles.

On the other hand, this level of sea level rise would increase the area of shallow basins, mangroves, and brackish marshes resulting in the increase of salt water dependent species.

In the Florida Bay area of the park, rising sea levels could submerge shallow seagrass flats under more water and raise salinity concentrations, adversely affecting fish habitat and associated estuarine fisheries. A June 2006 report by the National Wildlife Federation and the Florida Wildlife Federation highlighted these potential impacts and also suggested that sea level rise would harm the world-class recreational fishery in Florida Bay for bonefish, yellowtail snapper, permit, redfish, snook, spotted sea trout, and tarpon.

Florida Bay could be affected not only by sea level rise, but by rising temperatures as well. The IPCC report predicts that sea surface temperatures could rise between 2 and 5 degrees Fahrenheit by 2100. Scientists have linked high sea surface temperatures in 1987 to the seagrass die-off that occurred that same year. Higher sea temperatures could fuel algal blooms or promote marine diseases.

Sea level rise could also impact park buildings, trails, campgrounds, roads, and historic sites. Structures such as fixed docks and backcountry camping platforms (chickees) might become unusable if waters rise. On the other hand, deeper water might reduce the number of boat groundings in Florida Bay, a major problem facing the park. Sea level rise will exacerbate storm surge impacts and coastal erosion associated with tropical storms, both to natural systems and park infrastructure.

Sea level rise would likely push salt water into the Everglades and threaten the viability of South Florida's drinking water supply. Today, surface water from the Everglades is the principal source of freshwater for the underlying Biscayne Aquifer, which is in turn the source of drinking water for close to 5 million people in South Florida.

Everglades National Park is undertaking a number of actions in response to climate change. First, we are working hard with our partners to complete the Comprehensive Everglades Restoration Plan (CERP). By removing the canals and levees that form barriers to natural water movement, we hope to restore natural flows to the park and restore the Everglades' capacity to store water. More water in the Everglades would create a freshwater head that would act as a barrier to the landward push of saltwater. This freshwater head would make the Everglades ecosystem more resilient to climate change.

Second, we are carefully monitoring climate change indicators and projections, and using this information to shape our management actions. For example, recent information suggests that failed saltwater dams – or plugs – along canals in the Cape Sable area of the park have led to a decline in the number of American crocodiles in the area. From the 1990s until the failure of the plugs, the Cape Sable canals were the most productive crocodile nesting area in the park. The failed plugs let the tides push into the canals, creating strong currents and saltier conditions, both of which make the canals less suitable for nesting. While we would like to replace the plugs to block salt water incursions into the freshwater backcountry of the cape and protect the crocodiles, sea level rise suggests that we should consider structures that are less expensive and permanent than those we would consider in the absence of sea level rise. We are also considering more extreme actions such as storing the seeds of rare, endemic, and threatened and endangered species, and relocating coastal plant and animal species to adjacent protected areas.

Third, we are carefully evaluating how (and if) we construct and rebuild park facilities in flood-prone zones. For example, we have replaced fixed docks with floating or removable platforms so they are more resistant to sea level rise and storm events. We are taking sea level rise into account as we develop our plans to rebuild the lodging, docks, stores, and other visitor services at Flamingo that were seriously damaged by Hurricanes Katrina and Wilma in 2005. We plan to elevate buildings or construct temporary or mobile buildings that can be relocated in advance of major storms.

Fourth, we are one of nine units of the National Park System that has participated in the National Park Service's Climate Friendly Parks Program, a partnership effort between the Park Service and EPA. As part of that program, we have inventoried our sources of greenhouse gases and taken actions to reduce our emissions; utilize alternative fuels, such as biodiesel; operate a more efficient motor vehicle fleet; and implement comprehensive recycling and sustainable design and procurement programs.

Lastly, the park is a member of the newly-formed Miami-Dade Climate Change Advisory Task Force. This 25-member Task Force makes recommendations to the Miami-Dade Board of County Commissioners regarding ways that the South Florida community can work together to reduce locally produced greenhouse gases and to adapt to sea level rise and the impacts of hurricanes with potentially greater intensity and frequency.

In summary, given its geography and topography, Everglades National Park is very vulnerable to sea level rise. Sea level rise would impact the ecosystem, the park's infrastructure, our visitors, and our greater South Florida community. We will continue to monitor indicators of climate change in the park, and adapt accordingly based on what the science tells us. Most importantly, we will continue to do everything we can to restore the River of Grass, resulting in an Everglades ecosystem that will be healthier and more resilient to the effects of climate change.

This concludes my prepared testimony. I would be pleased to respond to any questions you or other subcommittee members might have.

STATEMENT OF DON L. NEUBACHER, SUPERINTENDENT, POINT REYES NATIONAL SEASHORE, NATIONAL PARK SERVICE, DEPARTMENT OF THE INTERIOR, BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON INTERIOR, ENVIRONMENT, AND RELATED AGENCIES
REGARDING CLIMATE CHANGE

APRIL 26, 2007

Mr. Chairman and members of the subcommittee, thank you very much for the opportunity to present testimony on the role of the National Park Servicce (NPS) in addressing climate change impacts on national park lands and their resources. I am the Superintendent of Point Reyes National Seashore along the California coast north of San Francisco. Over my 26-year career in the NPS, I have worked at Glacier Bay National Park, the Presidio, and the NPS Denver Service Center, in addition to Point Reyes.

Today my testimony will focus on our observations of the effects of climate change in national parks and more specifically, at Point Reyes National Seashore and the actions we are taking to prepare for the current and predicted changes from climate change.

Point Reyes National Seashore is one of 74 coastal units in the National Park System encompassing more than 5,100 miles of coast and three million acres of submerged resources including beaches, estuaries, coral reefs, kelp forests, and wetlands. These parks attract more than 75 million visitors every year, and generate over $2.5 billion in economic benefits to local communities. To conserve and restore these tremendous recreational and biological values, NPS Director Mary Bomar recently announced the Ocean Park Stewardship Action Plan (Plan), as called for by the President's U.S. Ocean Action Plan. This Plan sharpens our scientific focus and heightens our emphasis on conserving marine, estuarine and coastal resources in the National Park System. It acknowledges that we must expand collaborations with the states, the National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS) and academia to better understand and respond to impacts on ocean park resources from climate change and other issues.

National parks represent a wide range of ecosystems scattered across the nation, and present us with a tremendous opportunity to observe the effects of climate change on resource conditions that scientists and managers have documented over decades. More recently, the NPS Natural Resources Challenge Initiative that began in 2000 ensured that parks across the nation complete inventories and initiate monitoring of natural resources. The combination of these sources of information (long-term legacy monitoring data and new inventories) has provided us with timely examples of the effects of climate change in parks now.

Within the Intermountain and Pacific West Regions of the NPS, here are a few examples of what superintendents are observing, some of which may be associated with climate change:

- From 1850-1993, at Glacier National Park, there has been a 73% reduction in the area covered by glaciers and numerous smaller glaciers have disappeared altogether. Only 27 km^2 of glaciers remain from the 99 km^2 which previously existed. Similar reductions are occurring at Mount Rainier, Olympic, and North Cascades National Parks.
- In the western mountain parks, such as North Cascades, Yosemite, Rocky Mountain, and Glacier National Parks, snow pack is reduced and lower water content is present in the snow. This has led to water shortages throughout California and lower runoff to the ocean, which exacerbates already contentious issues over wildlife (salmon and other endangered

fish species) versus agricultural and urban needs for water. This year the snow pack in the Sierras was down approximately 30 percent.

- In high elevation parks, the ranges of animals and plants are shifting upward in elevation because of the warming of habitats with several species, such as picas, predicted to be lost with the loss of the boreal zone. This shift was documented in Yosemite by a recent repeat survey of areas that naturalist Grinnell surveyed in the 1930s.
- Coral reef die-off in Pacific island parks and kelp forests' loss in the Pacific coastal parks such as the Channel Islands National Park has been documented during El Nino events such as the one that occurred in 1998 due to the rise in average Pacific Ocean water temperatures.
- Dead zones off the coast of Oregon for the past 5 years have caused large pulses of nutrient input and phytoplankton blooms. These "dead zones," which suffocate crabs, fish, sea stars, and anemones on the ocean floor, have continued with those of 2006 now on the books as the largest, most severe, and longest lasting on record for the West Coast. These dead zones differ from those that have occurred elsewhere in the United States and widely around the world, because they are related to warm water rather than nutrient pollution. Redwood National Park is on the edge of a dead zone that is predicted to expand into California.
- Populations of six species of nearshore fish in California have collapsed due to lack of recruitment over the past 25 years. Over fishing, potentially combined with warming climate, could have decimated reproductive success in these nearshore rockfishes. These rockfish species are important as food for local marine species in all coastal parks from Redwood National Park to Cabrillo National Monument and to local fisherman.

Along with these examples, we have observed a number of specific impacts at Point Reyes National Seashore:

- The California rocky intertidal species` range shifted northward from 1931 to 1994,
- Almost every year, Point Reyes National Seashore experiences severe winter storm damage that requires emergency funding. Some parks are experiencing wetter winters with more rain in shorter periods, which results in increased erosion, flooding, and storm damage. Dryer summers and autumns lead to increased fire danger.
- Nearly one-third of all plants are non-native and an invasive plant pathogen called Sudden Oak Death is rapidly spreading throughout the park and other parks in the West. Non-native invasive species spread more rapidly with fire because they have a greater advantage in disturbed and rapidly changing environments, displacing native species.
- Seals were washed away by elevated sea levels and large waves in 1998 during an El Nino event. One western snowy plover nesting beach at Point Reyes is no longer usable because of over wash at high tides. The habitat of this federally threatened species will continue to diminish with sea level rise. Sea level rise also will cause loss of breeding and roosting habitat for seabirds and pinnipeds (seals and sea lions).
- Point Reyes is considered one of the foggiest places in the world, but in 2004 and 2005, the amount and timing of summer fogs were reduced because nearshore waters were warm. The fog patterns changed due to increased nearshore sea surface temperatures. Many forest and scrub species derive much of their moisture from fog drip.
- In 2005 and 2006, Point Reyes researchers documented very low krill populations off Point Reyes and Golden Gate National Recreation Area, resulting in complete breeding failure for the seabird, Cassin's Auklets. These are the first breeding failures recorded for this species in 30 years.

These impacts are not the only ones expected for our parks. Others are anticipated with the Intergovernmental Panel on Climate Change reporting that sea levels are rising and predicting that they will rise up to 7-23 inches this century. A Shoreline Vulnerability map for Point Reyes and other parks of the nation, created by the U.S. Geological Survey (USGS), predicts that rising seas will erode beaches and coastlines, submerge wetlands and swallow up Native

American cultural artifacts at coastal national parks. Inundation of coastal estuaries, intertidal zones, and beaches will result in overall beach loss. Estuaries (which are fish nurseries, filter pollutants, and protect the coast from storm surges) will be submerged faster than new sediment can build up. Valuable habitat for eelgrass beds, foraging waterbirds, shorebirds and nearshore fish will be lost.

Stronger and more frequent El Nino events may promote harmful algal blooms that are toxic to seals, seabirds, and fish, and can poison shellfish and the humans that consume them. Over the past decade the number and frequency of California sea lions exposed to toxic domoic acid from harmful algae have increased dramatically. Changes in the timing of upwelling bring nutrients and food to salmon that feed at sea too late. Salmon are a critical species protected by streams and nearshore ocean waters of Point Reyes. Global climate change may undermine extensive restoration efforts by NPS to improve stream habitat for salmon while the salmon starve at sea. The salmon go out to sea in mid-April to mid-May, but in 2005 they found nothing to eat at sea and by the time upwelling started, they were dead from starvation.

Additionally, wildfire intensity is increasing in the West. Nationwide, the 2006 wildland fire season set new records in both the number of reported fires as well as acres burned. A total of 96,385 fires and 9,873,429 acres burned were reported. This season was 125 percent above the 10-year average. Also, predictive climate models suggest there will be no Joshua trees in the future at Joshua Tree National Park.

Each of the above examples has ecological and economic costs associated with them. Wildfires damage ecosystems but also burn down private homes that are on the borders of parks. Sea level rise and storm surges result in erosion of shoreline and damage shoreline infrastructure such as roads and lighthouses.

Facing these scenarios of predicted change, how can parks prepare to preserve the nation's natural and cultural treasures, protect the supporting infrastructure, and inform the public? What is the role of national parks in this national and global challenge?

I want to assure you that the NPS is proactively addressing these issues, and in the Pacific West Region, climate change has been identified by park managers and scientists as their highest priority. In 2006, Jon Jarvis, the Pacific West regional director hosted three one-day workshops of park superintendents, scientists, interpreters, and resource managers to discuss global climate change and the National Park System. The workshops were held in Washington State, California and Hawaii.

In the first half of each workshop, scientists working in the field of climate research presented the "state of knowledge" of global climate change in order to build first a basic understanding among the participants of what we have learned from climate data around the world and particularly in the West. Scientists also presented likely outcomes of global climate change such as sea level rise, changes to oceanic currents, trade wind variations, animal migrations, and fire regime changes. The second half of each workshop was an open dialogue on what field managers are already seeing in the parks, the role the NPS might play in global climate change and the actions we should take next.

Out of these workshops, the parks are strategically advancing in five areas: 1) consolidating information from existing sources and through inventories to establish a baseline of condition; 2) monitoring resources to detect changes in trends of resource condition and to provide an early warning of changes; 3) developing a systematic approach so that parks adaptively manage to preserve and protect resources; 4) informing the public through example; and 5) collaborating with partners locally, regionally and nationally so that we provide a seamless network amongst land and ocean managers.

Collaboration is vital to success. Point Reyes along with other coastal parks in the Pacific West Region is working with state and federal agencies, and universities to advance this strategy. Some examples include:

- The parks are coordinating with state and county fire fighting agencies to train and respond to wildfires, and reduce fire hazards.
- USGS will monitor shoreline change using Light Detection and Ranging (LIDAR) remote sensing technologies.
- Point Reyes is working with the NOAA Integrated Ocean Observing Systems (IOOS) and the California IOOS is monitoring nearshore ocean currents and essential fish habitat.
- Coastal parks are providing data to the California eMARINE regional program to monitor changes in intertidal communities and to detect invasive aquatic species, latitudinal shifts in species and recruitment level impacts from global climate change.
- The park is monitoring trends in populations of marine bird, marine mammal, and krill, and monitoring changes in water quality and oceanography with the U.S. Fish and Wildlife Service and NOAA's Marine Sanctuaries.
- The California parks are working with the state and USGS to map nearshore habitats and to create Marine Protected Areas. MPAs will protect biodiversity from over- fishing and climate change by allowing species some time to adapt to new conditions without concurrently suffering population stress from harvesting. Channel Islands National Park was the first pilot MPA designated in the state and Point Reyes and Golden Gate are now working with the state.
- The parks are accelerating restoration of degraded coastal ecosystems such as estuaries and streams flowing into estuaries, so that the ecosystems become more resilient. A line item construction project that will start this year will restore Drakes Estero at Point Reyes by removing old dams and abandoned roads. A commercial oyster operation lease, a source of habitat degradation to the estuary, is scheduled to expire in 2012. The resiliency of ecosystems to climate change is greatly enhanced by removing destructive activities. For many ecosystems, it is truly a death by a thousand cuts.

Parks are a conduit for information and ideas provided by scientists in other agencies and institutions. We can provide real examples of how changes are occurring and steps that can be taken to protect and preserve resources. Two million visitors come through Point Reyes National Seashore every year, providing an exceptional opportunity to communicate the science of global climate change and its effects on communities, and to demonstrate examples of how to conserve biodiversity. Through resource stewardship, parks can set a standard and be models of sustainability. By using biodiesel, photovoltaic cells, electric and hybrid vehicles, and recycled materials, the parks demonstrate how to reduce energy consumption. By so doing, parks can serve as a catalyst for generating momentum and action in the larger community.

Finally, through the Research Learning Centers in park networks, middle-school and high school students have the opportunity to work alongside scientists and science educators to understand their future careers and life choices. Of all the actions we are undertaking in the Pacific West, and actions we are planning to do, the most important is to be positive and creative. The esteemed scientist Peter Raven stated in a recent editorial in the Journal Science that global climate change is a challenge for all of us, but if we act quickly, we can do something to slow it down and to prepare for the changes that are coming. The nation's parks are preparing for that challenge.

Thank you for the opportunity to present this testimony. I will be pleased to answer questions you and other members of the subcommittee might have.

TESTIMONY OF SAM D. HAMILTON
REGIONAL DIRECTOR, SOUTHEAST REGION
U.S. FISH AND WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR
BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON INTERIOR, ENVIRONMENT AND RELATED AGENCIES
REGARDING CLIMATE CHANGE

APRIL 26, 2007

Introduction

Chairman Dicks and Members of the Subcommittee, I am Sam Hamilton, Regional Director of the U.S. Fish and Wildlife Service's (the Service) Southeast Region. I am pleased to be with you today to discuss climate change and the Service's perspective on the habitat changes we are seeing, the impacts to trust resources, and the actions we are taking or anticipating to address some of those impacts.

Mr. Chairman, I want to thank you and your colleagues for your interest in this issue and your focus upon what is happening on the ground today. I also look forward to discussing some of the innovative steps the Service is taking to address this profound challenge to the stewardship of fish and wildlife resources.

Observations in the Natural Environment

Although debate continues over the extent to which global warming in a given region can be attributed to human activity versus natural variation, there is unambiguous scientific consensus that the earth's climate system is changing and that the related climate warming will have a significant impact on Earth's natural environment. For example, the recent contribution of Working Group II to the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report concerned the impacts of climate change on the natural and human environment and the capacity of these systems to adapt. Based on observational evidence world-wide, the Assessment concluded that there "is high confidence that recent regional changes in temperature have had discernible impacts on many physical and biological systems (IPCC WGII Summary for Policymakers, 2). The Assessment included the following examples illustrating the impact on natural systems:

- changes in some Arctic and Antarctic ecosystems, including those in sea-ice biomes, and also predators high in the food chain (IPCC, 2)
- earlier timing of spring events, such as leaf-unfolding, bird migration and egg-laying (IPCC, 3)
- poleward and upward shifts in ranges in plant and animal species (IPCC, 3)
- shifts in ranges and changes in algal, plankton and fish abundance in high-altitude lakes (IPCC, 3).

As you know, the Service is a field-based organization and our field employees are observing changes in many of our natural systems that appear to be correlated with changing climate. Nowhere are these changes more acutely evident than in the Arctic and Antarctic ecosystems. In the Service's Alaska Region, observations of Arctic changes include diminishing sea ice, coastal erosion, shrinking glaciers, thawing permafrost, wetland drainage, and earlier "green-up"

of Arctic vegetation. Related to the deterioration of glaciers, we are seeing changes in the hydrology of glacially-fed streams. Increased temperatures in the Arctic have also contributed to the earlier onset of snow melt and the lengthening of the melting season, resulting in decreased total ice cover at summer's end. To explore these changes and begin discussions of management strategies, the Service and the U.S. Geological Survey (USGS) co-hosted a workshop on climate change in Anchorage during March 7-9, 2007. The workshop provided the opportunity for the Service to collaborate with USGS on recommendations for research and monitoring priorities, management directions, and how to improve partner involvement.

These climatic changes in the Arctic will have profound impacts on ice-dependant wildlife like ring seals, walruses, and the polar bear. On January 9, 2007, the Service published a proposed rule to add the polar bear to the federal list of endangered and threatened species. The primary threat to this species is loss of habitat through the decrease in summer sea-ice coverage. Indeed, sea ice is essential habitat for many of the polar bear's life functions such as hunting, feeding, travel, and nurturing cubs. In collaboration with the USGS, the Service is continuing to study the polar bear's status and population trends, learning more about the polar bear's relationship to sea ice habitat and pursuing research to improve models for projecting the effects of a changing environment on the polar bear. Such research will be important in the Service's final listing determination and will play a key role in the decision about what is needed to ensure the conservation of the polar bear. Our final decision is due to be published in January 2008.

Like the polar regions, the Northeast, Northwest, and the Mountain-West, have also been experiencing reductions in annual snowpack. According to the USGS, climate changes of the last 50 years in these areas of the country have led to as much as a 17 percent decline in annual winter snowpack. The result is a diminished replenishment of ground water systems, increased stress to public water systems, changes in the timing of river ice-outs, and reduced river flows that impact spawning environments for fish such as Pacific and Atlantic salmon. Snowpack declines also have been accompanied by earlier annual peaks in river run-off, as documented in stream gage monitoring and analyses across the lower 48 states and throughout Alaska. As wildlife managers, we have managed around and through weather patterns like drought, which occur annually and can last years. However, now we are beginning to face growing certainty that these recent observations are not part of an annual or even decadal change in weather pattern, but are potentially linked to a long-term change in the climate system itself. If so, the implications for wildlife and fisheries management are consequential.

Apart from hydrology changes associated with increased warming, we are also noting changes in abundance and distribution of species. These changes in species' geographic ranges have also included the expansion of pests and invasive species. For example, we are seeing the expansion of the pine bark beetle into higher latitudes, areas that were once too cold to support it. These expansions are increasingly impacting our forest habitats, not just killing trees, but making these landscapes more susceptible to catastrophic wildfires. In turn, those wildfires could then drive fundamental shifts in ecosystem function.

Even if some species adapt or succeed in a world that is slowly warming, the fact remains that many will not. Species most at risk are those that are unable to generalize or adapt. Long-distance migrants and birds with limited geographical ranges, for instance, may not be able to adjust to the changes caused by rising temperatures. Increased competition for habitat and the lack of suitable or available food in new locations also means that the shift northward will not be a permanent solution for bird populations adapting to climate change.

Other significant changes associated with increased warming concern rising sea levels and water temperatures that pose threats to marine habitats, coastal wetlands, and estuaries, which are part of more than 160 national wildlife refuges we manage along the nation's coastline. For

example, Pea Island National Wildlife Refuge is part of the Alligator River National Wildlife Refuge Complex along the North Carolina coast adjacent to the Albemarle peninsula. This refuge is losing ground annually to the Atlantic Ocean and the projected rise in sea level over the next 50 to 100 years will likely transform large chunks of marsh to open water, forest into marsh, and complicate habitat needs for species including the federally endangered red wolf, as well as other species of birds and wildlife.

Similar threats are facing other refuges, like Merritt Island National Wildlife Refuge, which overlays and surrounds the Kennedy Space Center in Cape Canaveral, Florida and serves as a home to more than 300 species of birds. At this refuge, projected sea level rise over the next few decades threaten to engulf much of the refuge. The Oregon Islands National Wildlife Refuge, which supports significant seabird nesting and the Aransas National Wildlife Refuge along the Texas coast are also expected to experience substantial sea rise and subsequent loss of habitat for wildlife.

We are also seeing the consequences of rising temperatures in the Gulf of Mexico and elsewhere. Surface water temperatures in the Gulf of Mexico are exceeding 80 degrees for longer periods. Researchers believe these higher water temperatures are accelerating the intensity of algae blooms and incidents of red tide. Red tides are caused by marine phytoplankton that produce potent chemical toxins, which can cause significant fish kills, contaminate shellfish, and create severe respiratory irritation to humans along the shore. Some research also suggests a linkage between sea surface warming and increased hurricane wind strength.

Warmer ocean temperatures are also increasing the prevalence of bleaching in coral reefs globally. In reefs along the Florida Keys and elsewhere, increasing sea surface temperatures are generating more frequent and more intense events of coral bleaching and disease. Under thermal stress, coral expel the algae that live symbiotically in its tissues. The symbiotic algae gives the coral its color and without the algae, the translucent coral animal exposes the color of its skeleton and appears white – or bleached. Severe bleaching episodes can kill corals. Weakened by bleaching episodes, corals are more susceptible to disease and may have reduced growth and lower competitive ability with algae. Coral reefs managed by the National Wildlife Refuge System, like other reefs world-wide, are already being negatively impacted by bleaching episodes - most recently the reefs of Navassa National Wildlife Refuge were affected by the extreme Caribbean bleaching episode of 2005.

Through research sponsored by NOAA and the Climate Change Science Program, we are also learning that rising atmospheric carbon dioxide levels are making the ocean more acidic. Oceans are the largest absorbers of atmospheric carbon dioxide. As they absorb more carbon dioxide, the availability of carbonate ions is reduced. Reef-building organisms require an abundance of carbonate ions to build their skeletons and shells. As carbonate is reduced, coral and other species are less able to build their skeletons, maintain their structure, and battle erosion.

Adaptation and Mitigation Strategies

Floodplain and coastal wetland restoration are an important part of an emerging adaptive strategy to better position our collective agencies to effectively conserve trust resources. Barrier islands and coastal wetlands are our first line of defense against extreme weather events, serving to slow down the speed and intensity of hurricanes and storm surge and thereby reducing the damage and loss of life that can occur. For nearly four decades, the Service, in cooperation with NOAA and others, has chronicled the loss of coastal wetlands along the Gulf Coast, particularly along Louisiana's coast. Unfortunately, Hurricanes Katrina and Rita combined to transform more than 200 square miles of coastal wetlands, marsh, and barrier

islands to open water and accelerated projected wetland losses by a staggering 45 years to levels not expected before 2050. Notably, about two-thirds of Breton Island National Wildlife Refuge, part of a chain of barrier islands known as the Chandeleur Islands located off the coast of Southeastern Louisiana, disappeared in the wake of Katrina. In fact, Katrina shrunk this important chain of barrier islands – an important wintering ground for migratory waterfowl and neotropical birds – to about half its size before the storm.

In an effort to restore the Louisiana and Mississippi coastline, we will continue our work with the U.S. Army Corps of Engineers, which is leading the development of both the Louisiana Coastal Protection and Restoration Project and the Mississippi Coastal Improvement Project. These two projects are examining options and needs aimed at providing protection from future storm events through restoration of the coastal ecosystem and structural improvements such as levees.

Through the Coastal Wetlands Planning, Protection, and Restoration Act, funded through the Aquatic Resources Trust Fund, a joint federal-state task force, made up of representatives from the Departments of Interior, Commerce, and Agriculture, the Environmental Protection Agency, the Louisiana Governor's office, and the Corps of Engineers, has approved more than 78 wetland restoration projects for construction and allocated $625 million toward their completion since its inception 15 years ago. To date, the task force's work has protected, restored and enhanced nearly 400,000 acres of important coastal wetlands along the Gulf Coast.

In addition to coastal wetland restoration, the Service is learning to be more strategic in rebuilding facilities that were lost in the wake of Hurricanes Katrina and Rita. As a result, the Service is currently working to repair or replace dozens of facilities at refuges along the coast. As part of this effort, we are not replacing some facilities and are relocating others to more secure locations. We are well on our way to rebuilding our facilities for people across the region to enjoy as they once did.

Another strategy that the Service is pursuing is carbon sequestration. In the Service's Southeast Region, an innovative partnership was launched eight years ago aimed at restoring native habitats to bolster populations of wildlife and migratory birds through a terrestrial carbon sequestration initiative. We're working with The Conservation Fund, the Trust for Public Land, and energy companies like Detroit Edison, American Electric Power, and Energy to add 40,000 acres of habitat to our refuge system and reforest a total of 80,000 acres with more than 22 million trees sequestering 30 million tons of carbon over 70 years.

Last month, we announced a new partnership with The Conservation Fund and its Go Zero[SM] initiative that gives individuals and organizations a way to offset their own carbon emissions annually by calculating carbon emissions based on daily commuting patterns and home energy usage among other things. The Conservation Fund then offsets the carbon footprint by working with the Service to plant native trees on refuges. It's voluntary, non-regulatory, and represents a positive step towards reducing carbon emissions.

The next frontier for this effort is to figure out how we can create an incentive to engage private landowners to restore native habitats that sequester carbon. In addition, the Service is working with the Department of Agriculture and others members of the U.S. Coral Reef Task Force to replicate this sequestration initiative in other state and federal land management agencies as well as territories.

Increasing Our Knowledge Base

An improved ability to understand and model future abrupt climate change is essential in order to provide natural resource decision-makers with the information they need to plan for

potentially significant changes. To that end, the Service is working with the USGS to develop modeling and other research for assessing potential impacts from climate change. For example, the USGS is currently conducting research into water use and availability trends in order to examine the implications for managing the National Wildlife Refuge System. Part of this analysis will include projections on climate related changes in water availability.

In its Future Challenges partnership with USGS, the Service has also identified climate change as one of four overarching challenges facing natural resource management. The Future Challenges report is currently being finalized and will include recommendations for addressing climate change.

The Department of Interior is a member of the U.S. Climate Change Science Program, an interagency coordination body that sets research priorities for federal climate change science. Through the CCSP, Interior is partnering with other Federal agencies to author a chapter on adaptation strategies for the National Wildlife Refuge System. This chapter is part of the Synthesis and Assessment Product effort of the CCSP and will coincide with chapters on National Parks and National Forests. As part of this effort, the Service has obtained sea-level rise predictions for four National Wildlife Refuges in Florida, and we are working on ways to make modeling available for additional refuges so they can determinate the potential impacts on trust species and better plan future management strategies and land acquisitions for coastal refuges.

Finally, the Service is cooperating with USGS to implement a framework for conservation that we call “Strategic Habitat Conservation.” This is an adaptive management framework that begins with explicit trust resource population objectives.
The objectives are met by applying models and conservation biology principles into landscape habitat goals. Simply put, it’s a new conservation paradigm that looks at conservation in terms of “how much” and “where” to accomplish our highest conservation priorities, rather than “x” number of acres all over the place. It’s happening in the Lower Mississippi Valley and is being replicated across the country. We believe this science-driven framework will be a key ingredient in adapting our management strategies in response to changing climate.

Conclusion

Critical to our success in addressing these challenges will be our ability to build the capacity to understand the changing climate and to predict and adapt to its forcing effects on the natural environment. Admittedly, there is still a lot of work to be done, but the Service is making significant strides in developing adaptive and mitigation responses and expanding our knowledge of climate change trends and effects. Despite the enormity of the many challenges associated with this issue, the Service is committed to addressing climate change and its potential impacts on our Nation’s fish, wildlife, and habitat.

STATEMENT OF
RON HUNTSINGER
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BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR
BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON INTERIOR, ENVIRONMENT AND RELATED AGENCIES
REGARDING CLIMATE CHANGE
APRIL 26, 2007

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to appear here today to discuss natural resource management and climate change. I am the Bureau of Land Management's National Science Coordinator and as such oversee the application of science in the Bureau's resource management programs.

Background

The Bureau of Land Management (BLM) has the responsibility to manage over 261 million acres of public lands and natural resources for multiple uses by the American public while sustaining the health, diversity and productivity of these resources for future generations. My testimony today will address our natural resource management programs, as well as our own land management activities, in relation to climate change impacts.

Although the issue of climate change is getting increasing attention, the BLM has been dealing with factors related to climate change for decades, as some of these factors intersect with land management responsibilities included in legislation, such as the Clean Water Act, the Clean Air Act, the National Environmental Policy Act and our own Federal Land Policy and Management Act, hazardous materials and hazardous waste legislation, as well as Executive Orders and Agency and Bureau policies and regulations resulting from these mandates. We have also been addressing our responsibilities from additional mandates such as the Endangered Species Act, and agency initiatives such as rangeland and riparian health, and potential climate change impacts.

The BLM natural resource management program takes a comprehensive approach to managing the public lands under our jurisdiction, including addressing factors affecting climate change in the planning process. Through the planning process we identify the current condition of the resources, resource capabilities, and the potential impacts of proposed projects or management initiatives. The plans are designed to have a 15-20 year lifespan and accommodate unanticipated changes through updates and amendments. For a proposed project to be approved it must be consistent with the plan, and under the authorization process we impose whatever operational restrictions are necessary, require mitigation of unacceptable impacts and, if appropriate, restoration of the site at the completion of the project. The final step in the process is monitoring to assure that the conditions of the permit are adhered to, and the desired outcome is achieved. If it is determined that the resource objectives are not being met, changes can be made to implementation procedures. Through monitoring and evaluation, knowledge and experience are incorporated in to the next planning/management cycle.

The Bureau has reduced energy use and pollutant discharge and conserves natural resources in our business operations,. We are requiring that energy conservation features be incorporated in the design and construction of new facilities, and that existing facilities be retrofitted with these features. We are increasingly using renewable energy sources, such as green energy

programs and on-site solar and wind generation installations, in operating our facilities. We are using conservation practices such as low- or ultra-low flow plumbing, energy efficient lighting, recycled water for flushing toilets and landscape irrigation, and native landscaping to further reduce water use. We have also reduced the size of our vehicle fleet, and required that future purchases be of the most fuel efficient vehicles suitable to the job.

Changes that we have seen resulting from climate change

The Bureau has witnessed many changes, which may be associated with climate change, over the past decades in carrying out management programs. One of the most pervasive has been the evidence of desertification as a result of an increase in the frequency and duration of drought. This has been accompanied by reductions in surface flow and groundwater levels, and therefore a reduction in water availability. Changes in flow regimen have resulted in modification of stream channels and channel capacity, and a potentially permanent reduction in groundwater storage capacity. It has also resulted in conversion of vegetative stands to more drought hardy species of plants, accompanied by or resulting from the expansion of non-native and other undesirable species. Vegetative species adaptation has occurred, from changes in growth form to changes in life cycles. In order to survive the dry conditions, plants may respond through changes such as stunted growth or reduced reproduction. Because of the early onset of warm weather conditions they may initiate growth earlier than normal, or, depending on the rainfall or other factors that year, may remain dormant the entire season and not grow or reproduce at all. The effect of these changes has been a reduction in use by both domestic and native animals. This has resulted in the reduction of species numbers, and even the loss of species in the affected habitat.

The overall results of these changes are more fragile ecosystems, a greater susceptibility to the outbreak of attacks by parasites and diseased, increased vulnerability to wildland fire and erosion, and an overall reduction in carrying capacity of the land. In Alaska we have seen increased ablation and melting of glacial masses. We have also seen melting of the permafrost, resulting in loss of soil stability and increased erosion. This impacts such activities as winter road construction in support of economic development, such as for energy production.

There are other environmental impacts from factors resulting in climate change which are less well understood, such as the direct local effects of reduced visibility or increases in the impacts of wind storms. Given the state of our current knowledge, some of the effects are, no doubt, unknown at present

Further changes that we expect from climate change

Based on the models of climate change, and the fact that where the BLM is seeing these changes are in areas experiencing the most rapid growth of human populations in the US, particularly in arid areas such as southern California, Nevada and Arizona, we can expect these changes to continue, and the effects of the changes to increase from what we are seeing today. We may anticipate the loss of critical wildlife habitat, and habitat connectivity, and therefore eradication of both susceptible plant species and of species dependent on these habitats. This could be accompanied by the replacement of native desirable species with less desirable and non-native species, both plant and animal.

There could also be a continuation or possible increase, at least in the short term, of wildland fire hazard due to the low humidity and fuel moisture content of plants, vegetative die-off, and increased temperature regimes and accompanying wind events. There could be additional

reductions in available water supply in arid regions, further stressing the natural as well as dependent human systems.

The result is that we can anticipate further reductions in the level of allowable uses on public lands due to loss of productivity and capacity, and changes to dependent human communities both as a direct result of climatic factors and due to loss of economic opportunity.

What we are doing to address climate change factors

We have been dealing with the environmental effects of climatic variability and human activities for decades. Many of these factors are the same as are implicated in what we now recognize as climate change. As a bureau, we are beginning to address climate change as a comprehensive factor in general management planning, and to identify the effects under our cumulative impact analysis in environmental assessments. However, at this point there is little guidance in dealing with this issue, and differences of opinion as to the exact cause-effect relationships. As our knowledge of climate change processes matures our ability to address it will improve.

Additional steps that we are taking at present include changes to both administrative and on-the-ground activities. We are establishing policy and technical committees to address necessary actions and develop guidance to address climate change in agency management practices. For example, the Department has recently initiated the Climate Change Task Force, with subcommittees to address the issue from three perspectives: legal and policy, land and water, and science. Bureau manuals are incorporating guidance on addressing climate change. The air quality manual, undergoing approval now, is the closest to finalization.

BLM works collaboratively with others to understand climate change causative factors and effects, and to develop methodologies to identify impacts and measures to mitigate, adjust to, and remediate those impacts. Examples of these efforts include cooperating with the Fish and Wildlife Service, National Park Service and other agencies in Alaska on the North Slope Science Initiative to evaluate regional landscapes and the effects of development. Although climate change is not the focus of the effort at this time, it will likely be included as the program evolves, and regardless will provide additional information on climate change effects in arctic systems. We have designated the Bering Glacier as a Research Natural Area to facilitate research associated with glacial melting and how climatic changes are related in changes to that glacier.

We are including appropriate restrictions and mitigation requirements in permitting and implementing public land projects. We are monitoring, to a limited extent, implementation of projects to assure consistency with approved procedures, determine if adjustments are necessary, and determine the outcomes of our management practices. These results will be rolled back into our management programs to improve our management practices.

We are also implementing programs to address climate change on a broad scale. Our rangeland and riparian health initiatives are two examples. Under these initiatives we are identifying areas of Bureau-managed lands that are in less than healthy condition and implementing remediation projects to improve their condition. These projects include modification of permit stipulations, such as changes in grazing use; and improvement projects, such as seeding and invasive species treatments and fencing projects to exclude uses of sensitive habitats. We are participating in a restoration initiative for sagebrush habitat in the Great Basin, which has been extensively impacted by land uses, wildland fire, non-native plant intrusions, and climatic changes.

We are providing opportunities for increased production of renewable energy through permitting of wind, solar and geothermal generation projects, and projects for use of biofuels. At the same time we have reduced the adverse effects of new and traditional energy production and energy transportation through requirements such as reducing the footprint of production and transportation facilities, remediation and restoration of surface disturbances, limitations on activities during critical periods, offsite development of energy in sensitive habitats, and identifying specific utility corridors for energy transportation.

We are developing additional tracking, analysis, and predictive capabilities as well. As examples, the wildland fire program, in cooperation with the other federal agencies responsible for wildland fire management, is conducting a joint fire science program which produces fire response predictive models, and data bases of environmental monitoring and fire suppression data, and information on fire behavior under various climatic conditions. We are participating in realtime climate monitoring through operation and expansion of our Remotely Accessed Weather System (RAWS) and are cooperating in the Natural Resource Conservation Service snow survey program to assess winter snow loading, and moisture content to predict water availability and spring runoff.

In conducting Bureau activities we are implementing policies and practices that result in reduction of our use of energy and other natural resources, as well as production of pollutants that exacerbate climate change effects. We have issued Instruction Memorandum 2006-2207, which addresses high performance and sustainable buildings. Our standard leasing contract is being revised to require that LEED design on all facilities, contingent on the results of evaluations of three pilot projects requiring LEEDs compliant construction. We are converting from use of fuels which produce relatively greater amounts of air borne pollutants, such as fuel oil and gasoline, to cleaner fuel types, such as biofuels and propane (LPG). These efforts have resulted in a 49.7 percent increase in use of LPG and a significant reduction in the use of fuel oil. We are convening an Energy Conservation Workgroup to further develop our conservation strategies and providing training to field offices on fuel efficiency and alternative fuels. We are complying with Executive Order 13149 by reducing the size of our vehicle fleet, as well as requiring that future purchases be of smaller, fuel efficient vehicles while still being appropriate for the use. A percentage of these vehicles must use alternative fuels. Our new facilities, such as the California Trail Center in Elko, NV, the Pompey's Visitors Center near Billings, Montana, and the Rawlins Field Office in Rawlins, WY are being designed and constructed to take advantage of natural lighting, solar orientation, and natural landscaping, and energy efficient, green construction. Existing facilities are being retrofitted to take advantage of new technologies, such as on-site solar generation, reduced flow plumbing, climate control using ground source heat pumps, natural and energy efficient lighting using more efficient, hazardous material free ballasts and bulbs.

These are just some of the multitude of examples of actions that we are taking that address the issues associated with climate change.

What we anticipate doing to address climate change

The Bureau anticipates that, with the increased focus on climate change, we will place greater emphasis on those factors responsible for the phenomenon in continuing to support analysis and research to address specific questions related to public land resources. As our experience and knowledge increases, and working with other natural resource management and research organizations, we will develop further guidance to address climate change and its effects. We will also continue to improve our analyses
of cumulative effects resulting from activities on public lands, and the actions that are needed to address the effects of climate change on natural resource systems functions and uses. We will continue to refine management practices, including monitoring, mitigation, restoration and

adaptation, to address the impacts of climate change. And we will continue to utilize conservation practices in carrying out our own activities and programs in managing the public's resources.

Conclusion

Because of our experience in dealing with natural processes and human activities implicated in climate change the BLM is positioned to take the measures necessary in managing public land resources in the future in responding to climate change. We have contributed to, and participated in, numerous efforts to identify climate change factors and their effects on natural resources. But despite all of the efforts up to the present much is still to be learned, including answers to such fundamental questions as how much of the change we are witnessing is attributable to natural changes and how much is a result of anthropogenic effects, and what measures are robust enough and appropriate to reasonably address the impacts of climate change. Answers to these questions have substantial implications for how we respond to the effects of climate change now and in the future.

Thank you for the opportunity to discuss these issues with the committee. I would be happy to answer any questions that you have.

TESTIMONY OF P. LYNN SCARLETT
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DEPARTMENT OF THE INTERIOR
BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON INTERIOR, ENVIRONMENT AND RELATED AGENCIES
REGARDING CLIMATE CHANGE

April 26, 2007

Mr. Chairman, members of this committee, I am pleased to participate in this hearing on climate change. Through my overview, accompanied by presentations from several of the Department of the Interiors bureaus, we will highlight the effects of climate change on Federal lands, and waters, and how we are responding to those changes, and the role Interior plays in moderating greenhouse gas emissions.

Perhaps no subject relevant to managers of public lands and waters is as complex and multi-faceted as climate change. A changing climate may affect precipitation patterns, types and distribution of vegetation, incidence and severity of storms, the habits and habitat of wildlife, fire frequency, sea levels, and disease trajectories.

Interior's mission lies at the confluence of people, land and water. Hence, these possible landscape changes resulting from a changing climate may directly affect how we fulfill our mission. Consider Interior's vital statistics. We manage one in every five acres of the U.S. land mass. We operate dams and irrigation facilities that provide water to farmers who generate nearly two-thirds of the Nation's produce. We manage leases from which one-third of the Nation's domestic energy supplies are produced. The lands and waters we manage account for significant contributions to alternative energies such as biomass, geothermal, solar, and wind power. Our presence along the Coast is significant, with extensive areas of shoreline managed by parks and refuges.

Interior's U.S. Geological Survey plays an important role in generating earth science information and analysis. The Department also has a special role working with the State of Alaska and rural and Native Alaskan populations in maintaining fish and wildlife to support subsistence harvests.

In short, how well we do our jobs touches the lives of each and every American. It is, therefore, imperative that we understand climate dynamics, evaluate changes on the landscapes we manage, and take prudent steps to adjust and adapt our management to new circumstances. We must anticipate and prepare for likely changes on those landscapes to reduce adverse effects. Finally, we must also implement feasible and prudent measures to reduce greenhouse gas emissions through our own land, facility and fleet management.

Complicating our planning and responses are continued uncertainties, especially about the timing, scale, and site-specific incidence of climate change impacts. Widely respected models differ in their projections about precipitation patterns, changes in vegetation, extent of sea level rises, and so on. Moreover, global climate modeling is currently unable to provide meaningful descriptions and projections at the regional and smaller scales that are need to be useful for land managers on the ground.

These are our challenges but we are, across the entire Department, undertaking deliberate and focused efforts to address them. To coordinate and focus our efforts on climate change, Secretary Kempthorne convened a Climate Change Task Force, which I chair.

The Task Force comprises three subcommittees. The first, on legal and policy issues, is reviewing current practices for considering climate change effects in land-use planning and other formal procedures and decisions. That subcommittee is also reviewing relevant court decisions, Administration policies, and practices of other agencies. Their goal is to help guide the Department toward coherent, consistent decision making and documentation.

The second subcommittee focuses on land and water management. We will be cataloguing the types of impacts relevant to Interior managed lands and waters. The subcommittee will evaluate current and prospective options for addressing the effects of climate change. They will also examine our role in carbon sequestration. Finally, they will evaluate the management of Interior's facilities and fleet to identify opportunities for energy conservation and a broadening of the mix of energy resources we use.

The third subcommittee, chaired by USGS scientist Tom Armstrong, will focus on climate change science issues specifically relevant to Interior's responsibilities. The sub-committee will explore whether modeling might be developed at regional scales to better project more location specific changes to the landscapes we manage. They will evaluate information needs and whether new types and greater extent of monitoring might strengthen our understanding of on-the-ground trends in water availability and timing of flows, vegetative patterns, movement of species and so on.

With our extensive responsibilities in land and water management, several climate-sensitive problems are particularly relevant to the Interior Department. These include disaster management, water resource management, and habitat management.

My colleagues here today will detail some of our current and potential responses in these areas. But I will offer a flavor of the adaptation strategies we are both implementing and considering.

In water management, we've augmented our cooperation with States, irrigation districts and others to improve and implement conservation measures through precision irrigation, water banking and other best management practices.

Especially significant are our strategies to enhance the resilience of coastal ecosystems. We believe we need to continue to reduce wetland loss, both for the environmental benefits that result and because coastal wetlands and sea marshes serve as "horizontal levees", absorbing and reducing impacts from coastal storms.

For terrestrial areas, fire management and the President's Healthy Forests Initiative have a nexus to managing for the effects of climate change. One possible outcome of climate change is an increase in the incidence and severity of wildland fire in some parts of the continent and in Alaska. Such predictions underscore the imperative of continuing to reduce high fuel build up that has resulted in unnatural, catastrophic fires.

Though the effects of climate change present challenges for Interior, we also see opportunities to mitigate greenhouse gases through reforestation. Reforestation offers direct benefits for habitat enhancement while, at the same time, bringing about carbon reduction results. Already, in the Southeast, our Fish and Wildlife Service is working with the private sector to replant over 80,000 acres of forested lands in a carbon sequestration partnership.

Interior is working on carbon sequestration partnerships, in collaboration with the Department of Energy, EPA, and others. We are also developing ways to cost-effectively broaden the portfolio of energy sources we use in our operations, and increase energy efficiency in Interior's facilities and vehicle fleet. Interior manages approximately 145,000 facilities, more than any other agency except the Department of Defense. With many diverse facilities, Interior has opportunities to

showcase for the Nation energy conservation strategies. Already, use of renewable energy accounts for nearly 15 percent of the Department's energy use. With that percent, we outperform much of the Nation. Over the past 15 years, we've developed some 867 on-site renewable energy projects that include solar thermal projects, geothermal heat pumps, photovoltaic and wind projects.

Interior's consumption of petroleum based products in vehicles has declined 15 percent since 1999. We've achieved these reductions by reducing the size of the motor vehicle fleet, right sizing vehicles to meet mission requirements, and using alternative fuels. In fact, over 2,400 alternative fuel vehicles are part of Interior's motor vehicle fleet.

As Interior's managers anticipate and observe changing landscape conditions, several considerations may complicate our decisions. Most modeling efforts in climate change do not offer site specific predictions, yet actual impacts are and will be site specific. Modeling efforts to date that strive to give location specific detail still involve significant uncertainties. These uncertainties make incorporating climate considerations into land management decisions difficult. On the other hand, many of our land managers are already observing changes to the lands they manage that may be a result of climate change. Some of these changes, such as glacial retreat, are well documented through our own decades long monitoring, although our understanding of the role that climate change plays in this retreat is still developing. Appropriate responses to such observed changes are unclear.

For example, many parks, refuges and other conservation areas were created to preserve a specific mix of species within specific boundaries. Is in situ conservation possible within current, fixed boundaries, if species composition is changing? One possible management response to this dynamic, shifting context for species is cooperative conservation.

If species are shifting their nesting, forage, and other sites, partnerships with those who own and manage the sites may enable us to fulfill our wildlife management responsibilities.

Consider another question. If climate change alters the range, type and abundance of species on Interior lands, does that affect how we define and think about invasive species?

These are the kinds of questions Interior's land and water resource managers are asking. Through Secretary Kempthorne's Climate Change Task Force, we expect to illuminate our biggest challenges, prioritize our actions, and coordinate with USGS and the broader scientific community to identify prudent response strategies.

I thank you for convening this timely hearing and look forward to answering any questions.

STATEMENT OF
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BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON INTERIOR, ENVIRONMENT AND RELATED AGENCIES
REGARDING CLIMATE CHANGE
April 26, 2007

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear here today to discuss the potential impacts of climate change and activities in progress to mitigate these effects on public lands in the Great Basin. I am the Coordinator for BLM's Great Basin Restoration Initiative and am responsible to coordinate restoration-related activities across a five-state area for BLM.

Background

The Great Basin is North America's largest desert, encompassing 135 million acres of land between the Rocky and Sierra Nevada Mountains in western North America. The largest land manager in the Great Basin (includes parts of Nevada, Utah, Idaho, Oregon, and California) is the U.S. Department of Interior's Bureau of Land Management with oversight of 75 million acres of public land. (I could attach a map showing the boundary of the Great Basin in the five state area). The Great Basin is characterized by aridity (over half the area receives less than 12 inches annual precipitation) and a mix of shrubs, sagebrush (Artemisia tridentata) being the dominant with an understory of native grasses and forbs. Today, population growth, wildfires, and invasive species are reducing the quality of native rangelands at an accelerating rate. In 1999, a consortium of organizations led by The Nature Conservancy identified the Great Basin as the third most endangered ecosystem in the United States due in large part to the dominance of exotic species. Climate change is expected to accelerate these changes and associated impacts.

The Great Basin is a land of wide, historical fluctuations in climate both on a relatively short and long time frame. Extremes in precipitation (wet years followed by multi-year extreme droughts) and temperature challenge the management of livestock, wild horses and burros, and wildlife on public lands. Given this variability in climate, public land managers have flexibility in adjusting time and amount of forage consumption and water use to sustain land health over the long term. BLM managers evaluate these situations on a local basis and have the regulatory authority to remove livestock or wild horses during extended droughts when forage production or water sources are inadequate to sustain native vegetation. The challenge is to separate the natural climatic variation that has always existed in the Great Basin from the more recent climate changes in order to modify and adapt management strategies to better adjust to the changing environment.

Climate Change in the Great Basin

Observed 20th century climate changes in the Great Basin are similar to those reported in the western U.S and include:

1) Overall warming of 0.6° to 1.1° F in the last 100 years with the probability of very warm years increased and very cold years decreased.
2) Slight increase in precipitation across parts of the Great Basin with greater variability in high and low precipitation years.
3) Decline in snowpack since around 1950 with earlier loss of snowpack.
4) Increase in CO_2 and other greenhouse gases.

Observed trends are generally consistent with climate changes predicted to occur in the Great Basin by climate change models. Global change models produce variable results that provide an expected trend but not exact results. Projections are highly dependent on the model and the greenhouse gas scenario that are used. Projections made by the Intergovernmental Panel on Climate Change and results from the United Kingdom's Hadley Centre's climate model (HadCM2), indicate that by 2100, temperatures in the Great Basin could increase by 3-4 ^{o}F in spring and fall (with a range of 1-6 ^{o}F), and by 5-6 ^{o}F in winter and summer (with a range of 2-10 ^{o}F). Precipitation is estimated to increase by 10% in summer (with a range of 5-20%), to increase by 30% (with a range of 10-50%) in fall, and to increase by 40% in winter (with a range of 20-70%). The amount of precipitation on extreme wet or snowy days in winter is likely to increase. The frequency of extreme hot days in summer would increase because of the warming trend. It is unclear how the severity of storm events might be affected.

Potential Impacts of Climate Change on Great Basin Resources and Uses

The impact of climate change on Great Basin ecosystems may be magnified compared to other ecosystems due to the aridity and lower resiliency of these lands. Rangelands in the Great Basin are always "living on the edge" given the uncertain timing and quantity of precipitation, invasive species, altered fire regimes and increasing human population pressures.

Water

Water is the lifeblood of the Great Basin given the low precipitation and high evapotranspiration over the majority of the desert. Water is needed to support an increasing population (three of the ten fastest-growing metropolitan areas in the US are in or on the edge of the Great Basin) while still meeting livestock, wildlife and fish needs. The predicted changes of less winter snow accumulation, earlier peak spring streamflows, lower summer streamflows, and elevated stream temperatures could have dramatic effects on habitats and resources available to stream fishes. Rainbow and brown trout are predicted to be restricted to higher elevations than they currently are. The geographic distribution of the Lahontan cutthroat is projected to be reduced while the bull trout, currently listed under the Endangered Species Act as "threatened" with extinction in the northern portion of the Great Basin, could potentially face even greater risks as a result of climate change.

Change in the timing and amount of streamflows, spring and seep discharges will affect a wide range of wildlife species, livestock, and wild horses and burros. Water availability from these sources could dry up earlier in the summer as a result of the early melt of the snowpack causing increased competition for water and forage in smaller portions of the landscape. Climate change and the associated impacts on the timing and quantity of water available may exacerbate conflicts over water rights between agricultural and urban interests. Proposals to transport water from the Great Basin to Las Vegas are already a contentious issue under current water storage and use.

Vegetation

Impacts to the diverse plant communities in the Great Basin may occur at the landscape as well as the local level. On a regional basis, an increase in woody vegetation encroachment into grasslands, including a significant expansion of pinyon pine and juniper into sagebrush steppe, is expected. One model predicts that much of the sagebrush in the southern Great Basin could eventually be replaced by the more xeric Mojave Desert shrubs to the south due to projected higher temperatures and less frost in this portion of the Great Basin. The increase in trees will reduce palatable forage for livestock, habitat for wildlife, understory vegetation and thus result in increased soil erosion. Loss of sagebrush will have significant impacts on wildlife species, especially sage-grouse, which are dependent on this shrub-dominated ecosystem for food and shelter.

Increased CO_2 in the atmosphere is a topic of research and has not been clearly demonstrated. However, initial results indicate increased overall plant production favoring cool season plants (spring growers) relative to warm season (summer growers) plants. This plant response would change the composition of plant communities with potential negative effects on wildlife and insect species. However, livestock and some wildlife species could benefit from this increase in forage production.

Perhaps our greatest concern is that cheatgrass and red brome, exotic cool season grasses largely responsible for increased wildfires, respond more favorably to the increased atmospheric CO_2 than do most native plants. One recent study hypothesized that the recent increase in wildfires is caused in part by cheatgrass increases stimulated by increasing CO_2 levels. This study also found that cheatgrass will become more coarse (e.g., lignin content will increase) in the future which will reduce the time that it is palatable to livestock and wildlife and cause fuel loads to accumulate due to reduced decomposition rates. Fire suppression and rehabilitation costs, and private property losses may continue to accelerate under these plant community changes projected for the Great Basin. Besides the increased cost to the American public, wildfires in the Great Basin could be more extreme, especially in areas where woody vegetation has increased fuel loads. Risks to fire fighters and the public may continue to rise as well. More severe and frequent wildfires could increase weed expansion, soil erosion, and carbon loss, especially in areas dominated by the exotic annual grasses like cheatgrass. Disruptions to livestock operations on public lands could be more common and habitat important to wildlife and wild horses and burros may continue to decline. One unknown is the impact of climate change on the distribution of state or federal listed noxious weed species which currently cause great ecological and economic harm within the Great Basin.

What is BLM Doing To Prepare for Climate Change in the Great Basin?

Planning

Great Basin Restoration Initiative (GBRI) has assisted in preparing some draft guidance on incorporation of climate change in Great Basin Land Use Plans. The Ely, Nevada RMP in progress now includes a section on climate change.
Climate change is addressed in the “2006 Conservation Plan for Greater Sage-grouse in Idaho” as it was ranked as the ninth of 19 threats to sage-grouse and sage-grouse habitat in Idaho. Twenty conservation measures were developed to help local sage-grouse working groups address climate change as they develop conservation strategies and local projects. More emphasis on climate change will be incorporated into land use and sage-grouse plans in the future with additional Washington Office guidance and GBRI technical assistance.

Science and Monitoring

A key component of GBRI is the application of science and monitoring to improve our ability to maintain healthy landscapes and strategically restore degraded areas. Consideration of potential effects of climate change are incorporated into these restoration strategies since treatments applied today will have to be able to survive and flourish into the future to meet resource and social needs. For example, re-establishment of sagebrush in areas burned by wildfires is a high restoration priority. Sagebrush is very sensitive to the local climatic conditions in which it evolved. Since sagebrush has an expected life span of 50-100 years, it is imperative that appropriate seed sources be selected for current seeding projects to maximize the potential of the sagebrush that establishes to be adapted to survive in an altered climate in the future.

One of the most appropriate strategies to increase the resiliency of Great Basin ecosystems to future disturbances and climate change is to either maintain or restore a diverse native plant

community. Native plant diversity acts as an insurance policy against future changes by including a suite of species adapted to different environmental conditions. Loss of a few species, although not desirable, will not cause the system to crash. To improve BLM's ability to restore degraded rangelands now and into the future, GBRI has sponsored a regional science and development project to increase the availability of native plants for restoration. This program, "Great Basin Native Plant Selection and Increase Project" was initiated in 1999 as part of the BLM's Native Plant Initiative and has 17 state, federal, academic and seed industry cooperators today. Native seed collections have been made from nearly 1,500 sites in the Great Basin providing the project cooperators with an extensive collection of native seed to evaluate, select and augment production of native plant seed. Having a wide variety of native seed available for purchase in the future will provide managers with the needed plant materials to re-establish diverse native plant communities more resilient to the effects of a warmer climate with more erratic precipitation patterns.

Monitoring the potential impacts of climate change on the flora and fauna on the 75 million acres of public land in the Great Basin requires a landscape approach. GBRI is participating with the USGS on the development of a "Great Basin Integrated Landscape Monitoring Pilot Project" that will assist managers to predict effects of climate change on stressors such as invasive species and wildfires at a landscape scale. GBRI has also implemented a regional pilot project under the BLM Assessment, Inventory, and Monitoring Project in the heart of the Great Basin in the Owhyee Uplands. This project has been designed in part to provide baseline data at the landscape level to monitor plant community changes over time. This will improve BLM's ability to detect plant community changes over time and to better distinguish climate change influences from other forms of disturbance.

BLM is represented on the Executive Committee for the development of the Intermountain Regional Ecological Observatory Network (IRON), the Great Basin regional application to the National Science Foundation's National Ecological Observatory Network (NEON). NEON seeks to establish a continent-wide distribution of environmental monitoring infrastructure, including eddy flux towers, sensors for air, soil, and surface water temperatures, windspeed and direction, precipitation, and barometric pressure, photosynthetically active radiation, plant transpiration, and atmospheric composition (CO, CO_2, O^3, others). Measuring biological response to climate and climatic variation, including the spread of invasive species and infectious diseases, is central to this program. The IRON application seeks to install the monitoring infrastructure on BLM land in the Utah West Desert. IRON asks how ecosystems and their components will respond to changes in natural and human-induced climate across spatial and temporal scales and what system attributes best predict sensitivity to climatic factors. BLM scientists are participating in the design of experiments specific to land management in the Great Basin.

GBRI is representing BLM in the development of a charter for the "Great Basin Research and Management Partnership" to improve communication and research to better meet manager needs across the Great Basin. Over 200 managers, scientists, non-government organizations and private citizens met in Reno, Nevada in the winter of 2006 and identified climate change as one of the key challenges in the Great Basin where better linkages between scientists and managers would prove beneficial.

BLM is an active participant in other research that has or is producing data and analysis with application in adaptation to climate change. These efforts include the National Center for Ecological Analysis and Synthesis Nevada Conservation Area Design, the Joint Fire Science-Funded Sagebrush Steppe Treatment Evaluation Project and the USDA-funded Integrating Weed Control and Restoration for Great Basin Rangelands.

Restoration Implementation

Restoring native vegetation where conversions to exotic annual grasses or noxious weeds have taken place will provide more plant community stability under an environment affected by climate change. In addition, carbon sequestration will be facilitated in native communities compared to annual grass communities that reburn at frequent intervals. Nearly 25 million acres of public lands in the Great Basin have some cheatgrass (Bromus tectorum, an invasive exotic) as a component of the community.

The DOI's Healthy Lands Initiative is providing support and funds to implement restoration projects at the landscape level with multiple partners. All of the projects implemented under this Initiative will promote the maintenance or restoration of healthy native plant communities with the increased ability to survive or adapt to anticipated changes in the environment in the future. Three of the six geographic areas receiving Healthy Lands Initiative funding are in the Great Basin which provides multiple opportunities to improve or maintain land health in this important landscape.

GBRI will continue to serve as a focal point for the application of science and technology to successfully restore Great Basin rangelands. As the science and predictive ability of climate change models continues to evolve, GBRI will provide a basin-wide perspective on this issue to inform BLM managers of appropriate restoration strategies.

Summary

The Great Basin is experiencing climate change effects that are expected to increase in the future. Key indicators of climate change are changing distributions of plant and animal species in the Great Basin. Managers in the Great Basin are cognizant of some of these changes but the magnitude of the changes expected in the future probably exceed the capability of this fragile desert to adapt in full to the changes. However, BLM has a long history of adapting to current environmental changes so the mechanism is in place to adjust management to accommodate some of the projected changes. GBRI and the BLM as a whole maintain a watching brief on climate change, following discussion in the scientific community and participating in and supporting mission-relevant research. GBRI will continue to assist managers in the adaptation process by supporting the science and technology required to maintain or restore healthy plant communities. This concludes my testimony. I would be happy to answer any questions you may have.

STATEMENT OF
DR. THOMAS R. ARMSTRONG
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U.S. DEPARTMENT OF THE INTERIOR
BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON INTERIOR, ENVIRONMENT AND RELATED AGENCIES
REGARDING CLIMATE CHANGE
APRIL 26, 2007

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to participate in today's hearing on climate change and particularly to discuss its impacts on public lands. My name is Thomas R. Armstrong, and I am the senior advisor for global change programs at the U.S. Geological Survey (USGS). I also represent USGS and the Department of the Interior (DOI) as a member of the U.S. Climate Change Science Program (CCSP) and am the U.S. Head of Delegation to the Arctic Monitoring and Assessment Program, a working group of the Artic Council.

Global climate change is one of the most complex and formidable environmental challenges facing society today. While climate change is a natural, continuous Earth process, changes to the Earth's climate are related to human activities as well. Whether the causes are natural or from human influence, our focus is on understanding the impacts of climate change and the potential adaptive strategies for managing natural resources and ecosystems in the face of these changes.

Climate change affects biota, water, ecosystems, cultures, and economies. In order to effectively manage its lands and trust resources, the Department of the Interior, working within the broader U.S. interagency climate change science framework, has a responsibility to further the scientific understanding of climate change processes and impacts. The USGS has a long and distinguished history of conducting research, monitoring and modeling of climate change and its physical and biological impacts. The USGS strives to understand how the earth works and to anticipate future changes. We conduct scientific research to understand the likely consequences of climate change, especially by studying how climate has changed in the past and using the past to forecast responses to shifting climate conditions in the future; distinguishing between natural and human-influenced changes; and recognizing ecological and physical responses to changes in climate. These strengths allow USGS to play a critical role in conducting climate change science across the Nation's terrestrial, freshwater, and coastal systems and in providing objective science to assist decision-makers.

The United States and other nations will be challenged to develop adaptation and mitigation strategies that will anticipate the effects of a changing climate and its impacts on humans and ecosystems. The USGS provides on-the-ground scientific information from its numerous observation and monitoring networks and research activities. These observations and related research efforts are important components for building climate models, especially those that deal with the impacts of climate change to terrestrial, freshwater, and marine ecosystems. The ability to provide ground-truthing across multiple scientific disciplines in a wide variety of spatial and temporal scales enables USGS to play a key role within the climate science community as nations strive to develop adaptation and mitigation measures.

USGS findings and data provide critical information to decision-makers regarding many important climate-related issues, such as:

- Future availability of water for people and ecosystems. The USGS climate change science program has resulted in several scientific findings regarding how streamflow has been changing in recent decades. In particular, these studies point to significant shifts in the timing of snowmelt runoff in New England, and throughout the mountains of the western United States. These studies are crucial for informing operations and planning for water resources.

- Current and future trends of climate warming in the Arctic and resultant permafrost degradation and impacts on energy and transportation. USGS is conducting several coordinated studies on the North Slope and Yukon Basin of Alaska. Emphasis is on permafrost and climate effects monitoring and related ecological and socio-economic changes. This work is a partnership with the U.S. Forest Service, the U.S. Fish & Wildlife Service, the Bureau of Land Management, the National Park Service, the University of Alaska, Alaska State agencies, and various Native communities.

- Impacts of climate change on land use and landscape change. In partnership with NASA and NOAA, USGS is involved in a variety of activities that are critical to understanding the impacts of climate change on public lands. These include monitoring of coastal zone topography and bathymetry; the production and distribution of national topography data; and improving our knowledge of topographic surface change through Landsat, and Light-Imaging Detection and Ranging (LIDAR) and radar imaging of the U.S. national land surface.

- Proliferation of invasive species and impacts on biodiversity, habitat, and ecosystems. USGS is conducting several major studies throughout the United States looking at the evolution of forest and rangeland communities as a response to warming climate and changes in precipitation. The U.S. Forest Service, several land resource bureaus of the Department of the Interior, and numerous State resource agencies are important stakeholders.

The USGS and other Federal agencies are engaged in understanding the impacts of climate change on both humans and ecosystems. Scientists must relay relevant information, analyses, and conclusions to policymakers, resource managers, and the general public. Aside from warming temperatures, other ecological and physical consequences of climate change may include strong storms, sea-level rise and coastal erosion, loss of coral reefs, droughts and floods. If scientists can better inform decision-makers about what to expect from climate change, this will enhance the development of short- and long-term strategies for protecting the public welfare and maintaining healthy and viable ecosystems and natural resources. For instance, studies conducted by USGS and others show that sea-level rise will continue to impact coastal zones throughout the world. Present and future resource managers can take into consideration this scientific conclusion when developing adaptive management strategies for restoration and long-term stewardship of land, water, and biological resources in coastal areas. Scientific findings related to climate change must be delivered in a timely manner so that decision-makers are informed by the most relevant, up-to-date, objective information possible. Furthermore, scientists must provide this information with accurate estimates of uncertainty so that conclusions and recommendations drawn from scientific studies can be properly evaluated. The Climate Change Science Program (CCSP), of which USGS and DOI are members, is actively involved in developing a more effective decision support strategy for stakeholders.

Although science has come far in understanding the impacts of climate change on humans and ecosystems, many significant challenges and unique opportunities to better understand the long-term climate future for our planet remain. These include:

- Developing a holistic, earth-systems science approach to help communities and natural resource managers prepare for climate change impacts;
- Better distinguishing natural climate change from that imposed upon the natural system through human activities so that effective mitigation strategies can be developed and implemented by decision-makers;
- Developing a better understanding of how the earth and its physical and biological processes interact, and with this understanding respond to climate change over the short-term and well into the future;
- Forecasting climate-related impacts for physical and biological systems;
- Forecasting precipitation changes as a consequence of changing climate;
- Determining how global warming may affect the frequency, intensity, and paths of strong storms, including hurricanes;
- Understanding effects of climate change on ecosystems.

There is increasing consensus that these climate change effects must be monitored and the impacts on the Nation's resources must be managed. DOI has a natural role among Federal agencies to address climate change on Federal lands and can bring all of its resource management, science, and information capabilities to bear in accomplishing that goal. Initiatives such as the Healthy Lands Initiative, the Healthy Forests Initiative, and the U.S. Ocean Action Plan, which are highlighted in the Department's fiscal year 2008 budget request can assist DOI land managers in the management of lands and resources.

Areas where DOI has expertise or activities underway include:

1. Studies of large watersheds to monitor and investigate climate change effects on the landscape. The study of large watersheds provides data that can be used to better understand the processes involved in climate change and to improve climate models that depend on this data to make accurate predictions of climate change.
2. Monitoring networks focused on water, biota, and permafrost to establish a stronger basis for future detection and definition of climate change impacts at a national and regional scale.
3. Ongoing land remote sensing programs of the United States to track changes on the earth's surface at regional to global scales.
4. The collection of paleo-environmental and instrumental information for a continuous long-term record of past and present climate change and its impacts.
5. Geospatial climate information management system for decision support for resource managers building on existing data systems such as The National Map, National Biological Information Infrastructure (NBII), National Water Information System (NWIS), National Phenology Network, and the NPS Vital Signs Network.
6. Decision support tools and products to assist decision-makers in the management of wildfire, water resources, ecosystems, and coastal and wetland landscapes in the future.

Thank you, Mr. Chairman, for the opportunity to present this testimony. I will be pleased to answer questions you and other Members of the Subcommittee might have.

Appendix F

Reference Section

This section contains links to more detailed information on some of the topics discussed by the NLC.

DOI Competitive Sourcing Green Plan
http://www.doi.gov/perfmgt/competitivesourcing/green_plan_approved.doc

Greenbook
http://home.nps.gov/applications/budget2/downloads.htm

Human Capital Preliminary Planning Effort
http://inside.nps.gov/waso/waso.cfm?prg=114&lv=2

National Park Centennial Challenge
http://www.nps.gov/2016

National Park Foundation
http://www.nationalparks.org/Home.asp

OPM Federal Human Capital Survey - 2006
http://www.fhcs2006.opm.gov/