2011 Natural Resources and Science Symposium
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Plenary:

One Integrated Regional Climate Strategy: An Impossible Dream?

Will Travis, Executive Director, San Francisco Bay Conservation and Development Commission

One of the most publicized impacts of global warming is a predicted acceleration of sea level rise, which would increase the historic rate of sea level rise, which between 1900 and 2000, raised the level of the Bay waters by seven inches. As a result, water levels in San Francisco Bay could rise an additional 1.4 meters or more by the end of this century and inundate over 330 square miles of low-lying shoreline property and over $60 billion worth of public and private development.

Over the past few years, the San Francisco Bay Conservation and Development Commission (BCDC), the state coastal management agency for the Bay, has been working with three other regional agencies that deal with land use planning, transportation and air quality have been formulating a comprehensive regional strategy for addressing climate change by reducing greenhouse gas emissions and adapting to sea level rise in the Bay region.

Integrating greenhouse gas mitigation with sea level rise adaptation has proven challenging. The regional greenhouse gas mitigation strategy focuses on the region's single largest source of emissions—private vehicles. To reduce driving, the strategy calls for future development to be mixed use, mostly within the existing urbanized core of the region, more compact, and concentrated near transit corridors. However, much of the existing development and many transportation corridors are in low-lying areas around the Bay that are vulnerable to sea level rise. Therefore, the sea level rise strategy takes a triage approach: protect high-value regionally significant resources; enhance wetlands and retreat from the shoreline in undeveloped areas; and employ innovation and experimentation in other areas.

For more information:
Websites:

- http://www.bcdc.ca.gov/planning/climate_change/climate_change.shtml
- http://www.bcdc.ca.gov/proposed_bay_plan/bp_1-08_cc_draft.pdf
- http://www.bcdc.ca.gov/proposed_bay_plan/bp_amend_1-08.shtml
- http://www.risingtidescompetition.com/risingtides/Home.html
- http://risingtides.csc.noaa.gov/

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Theme: Climate Change Adaptation Strategies

Effects of weather on survival rates in Song Sparrows

Kristen E Dybala, PhD candidate, Graduate Group in Ecology, University of California, Davis

Resource management decisions require reliable projections of species' responses to climate change. Current research predicts that many species ranges will contract or dramatically shift in the next century. If these projections are correct, many populations may decline or be extirpated from the parks and refuges designed to protect them. However, this species-distribution approach to studying climate change cannot explain how these declines will occur on a local scale, or, importantly, what management actions might be taken to minimize the impacts of climate change. My approach is to study the impacts of climate change on local population dynamics. The first step is identifying relationships between weather factors and demographic rates. Here, I report on the results of an analysis of the effects of weather on survival rates for a population of Song Sparrows in the Point Reyes National Seashore. Song Sparrows are currently a common species, but some projections suggest they will become rare in the Bay Area. I examined survival rates in adults and juveniles over the past 30 years and tested for the influence of weather factors, such as precipitation and temperatures, on survival rates.

For more information:
Websites:

- More information about this research project: http://sites.google.com/site/dybalaresearch/
- PRBO Conservation Science: http://www.prbo.org
- Graduate Group in Ecology: http://ecology.ucdavis.edu

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Preventing the Extinction of the Federally Endangered Sonoma Spineflower at Point Reyes National Seashore

Amelia Ryan**,** Point Reyes National Seashore

Sonoma spineflower is a federally endangered plant species with only one known surviving population, located on a single 3-acre area on Point Reyes National Seashore (Seashore). Because there is only one remaining natural population of this species, it is especially vulnerable to potential threat such as climate change. In 2010, the Seashore received a USFWS grant to prevent the extinction of this extremely rare plant. The Seashore took a four- pronged approach: improvement of conditions in the existing habitat by removing invasive species, relocation of a ranch road through the population, collection of seed for long term storage in a seedbank, and a carefully planned reintroduction project. Prior to the reintroduction, a study was carried out correlating plant survival, size and reproductive output to soil and hydrologic characteristics in the natural population and in failed and moderately successful prior reintroduction attempts. This data was used to implement new reintroduction efforts on sites where soil and hydrologic characteristics most closely resembled the study sites most correlated with measures of plant success.

For more information:
References:

- U.S. Fish & Wildlife Service. 1988. Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly (in PDF). Portland, OR. http://ecos.fws.gov/recovery_plan/pdf_files/1998/980930d.pdf
- Davis, Liam H. and Sherman, Robert J. 1992. Ecological study of the rare Chorizanthe valida (Polygonaceae) at Point Reyes National Seashore, California. *Madroño*. 39(4): 271-280.

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Climate Change Adaptation Strategies

Kerri McAllister, Headlands Institute

Learn the approach taken by NatureBridge as we work to integrate climate change education into our programs. Find out how we prepared, what steps we have taken, what we have achieved, and the lessons learned along the way.

NatureBridge is committed to inspiring personal connections to the natural world and responsible actions to sustain it. We educate the next generation of leaders to respect the natural world and preserve it for future generations. Operating four campuses, NatureBridge is the largest nonprofit residential environmental education partner of the National Park Service. Each year we help more than 40,000 people from diverse backgrounds find a personal connection to nature through field science education, youth leadership, and teacher training programs. In nearly 40 years, we have introduced almost one million students to the wonder of our national parks. We have inspired many of them to pursue efforts in conservation and service.

Recently, leadership at NatureBridge articulated a vision for its education staff to become industry leaders in providing Climate Change Education through new and existing programming. While climate science as a subject has been used by many of our educators for several years, achieving this vision will require systematic integration across our programs. This challenge is at once energizing and intimidating, as we work towards focusing the educational impact of a program steeped in decades of history towards a vast and ever-changing subject.
This presentation will detail the strategy and approach taken by NatureBridge education leadership as we embark on this journey. Attendees will learn how we prepared, what initial steps we have taken, what we have achieved, and the lessons we are learning along the way.

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Facilitated Climate Change Communication

Will Elder, Golden Gate National Recreation Area

The National Park Service is developing a training module for interpretive rangers focused on climate change communication though facilitated discussions with and between visitors (civic engagement interpretation). This module also may inform scientists involved in climate change studies on better ways to communicate and connect with the public. This presentation will provide an overview of how civic engagement interpretation may be used for climate change communication.

Because of the controversy surrounding climate change, coupled with the need to firmly elucidate the agency's position without the appearance of unfettered advocacy, it is thought that facilitated discussions will be effective way to take the public through a stewardship continuum from connection to expression and participation, and finally to action.

This is a departure from traditional interpretive methods and will require a firm understanding of many things, including: the scientific process, climate change science both globally and park-related, the agency's position, the audience and their understanding and biases as well as the interpreter's own biases, facilitation techniques to harnessing the energy of controversy and create collaborative dialogues, and finally how to provide direct and indirect opportunities for citizen action.

For more information:
Websites:

- Development site for the climate change civic engagement module: https://sites.google.com/site/npsccce/
- Interpretive development program website: http://www.nps.gov/idp/interp/

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Theme: Oceans Science and Stewardship

The virtual network of ocean parks and coastal and marine spatial planning

Sarah Allen, NPS Pacific West Region

In the Pacific West Region, there are some 24 Ocean Parks that account for more than 700 miles of shoreline and 2 million upland and submerged acres. The parks are a transect across ecosystems from north to south and east to west, and across time including ancient cultures to modern memorials. NPS developed a National Ocean Strategy and the Alaskan and Pacific West Regions recently developed a joint Pacific Ocean Strategy. A primary goal of the strategy is to create a seamless network between ocean parks and other agencies and groups to better know, protect and restore ocean resources. Inventories of substrate and benthic mapping are common fundamental requirements for all parks to guide the science and decision making. In 2010, an Executive Order provided further guidance in ocean protection for all federal agencies. The EO emphasized that ocean management would be ecosystem based and guided by sound science. As stated in the EO, coastal and marine spatial planning (CMSP) "provides a public policy process to better determine how the ocean, coasts, and Great Lakes are sustainably used and protected now and for future generations." The parks of the SFBAN include six coastal parks ranging from the recently designated Port Chicago NHS to Point Reyes National Seashore. The ocean parks of the Pacific West have many common inventory and monitoring needs
that are not generally covered under the I&M Program but are fundamental to CMSP, hence the notion of a virtual network of ocean parks.

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NOAA's MPA Center, MPA Inventory Expansion

Hugo Selbie, Jordan Gass, Mimi D'Iorio, Rondi Robison, NOAA National Marine Protected Areas Center

The national picture of marine protection is constantly evolving, for example multiple Marine management techniques have expanded to include various types of marine protected areas (MPAs) and other sorts of place-based management.
To reflect the best available information on MPA boundaries, resources and management; NOAA's MPA Center initiated an effort, with federal, state and territorial MPA programs and partners, to create a database to characterize MPAs in U.S. oceans and the Great Lakes.

The database, named 'MPA Inventory' is an informational product currently hosted online, designed to provide a cohesive, geographically-based analysis on the protection status in U.S. marine waters. Although spatially comprehensive, recent developments, such as the Administration's Coastal and Marine Spatial Planning initiative and the Gulf oil spill, have highlighted the need for more detailed information on marine resources to better inform management decisions. To address this need, the MPA Inventory is being expanded to incorporate resource and management information at the site level.

The MPA inventory expansion will incorporate data on the presence of living marine resources and habitats, cultural resources, management and legal authorities, monitoring activities and specific restrictions to the MPAs. These data will be hosted online and enable users to conduct spatial resource assessments relating to specific marine resources on the fly and, identify gaps in resource management. This presentation will describe the inventory expansion process, discuss the benefits of such databases with examples of analyses now possible with the updated information and provide insight into challenges encountered.

For more information:
Website:

- http://oceanservice.noaa.gov/topics/oceans/mpa/

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Teaching Ocean Science and How to Be an Ocean Steward

Rachel Loud, Headlands Institute

Find out how Headlands Institute is educating young minds about the ocean and encouraging them to become stewards of the environment. Our Field Science program allows teachers to select an area of study for their visit. Marine ecology is our most requested emphasis. All of our programs are taught with three goals in mind: developing a sense of place, creating connections between learning and their home communities, and stewardship.

In this presentation we'll examine how Headlands Institute fosters a sense of place within the GGNRA. We'll learn about some of the resources we use to draw ecological connections between activities such as plankton labs, intertidal/tidepool inquiries, Pacific Gyre education, and cultural exploration of various seafood and issues surrounding it. We'll further discuss how we make learning done in the Headlands relevant to participants' home communities. Finally we will conclude by focusing on what Headlands Institute is doing to promote stewardship of our coasts and oceans through activities such as Plastic Action Strategies and beach clean-up.

For more information:
Websites:

- Headlands Institute website on Core Educational Framework: http://www.naturebridge.org/educational-philosophy
- Headlands Institute website on Marine Ecology: http://www.naturebridge.org/headlands/marine-ecology

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Theme: Monitoring and Trend Detection

Assessing Resource Conditions at the Right Scale

David M. Stoms, Frank W. Davis, and Patrick A. Jantz, Bren School of Environmental Science & Management, University of California Santa Barbara

Ecological processes operate at characteristic spatial scales that are often larger or smaller than park units. Although every ecological process and stressor has its own characteristic reference scale or region, we propose simplifying these to just three scales or geographic domains for natural resource condition assessments: the park unit itself, the park plus a buffer out to 10 kilometers surrounding the park boundary), and an ecologically-relevant region. No single geographic division (e.g., ecoregions, counties, watersheds) is adequate to delineate such an assessment region, so we created a hybrid of river basins and ecological subsections as a useful compromise between optimal units for aquatic and terrestrial species and ecosystems. In this presentation, we explain the rationale for the three reference regions. Developing conceptual models of the stressors and endpoint condition indicators helps identify the appropriate spatial scales for data collection and analysis. We then illustrate with an assessment for one indicator at Pinnacles National Monument. This hierarchical framework can generally be applied in the condition assessment for any national park unit.

For more information:
Website:

- GIS layer of "hydroecoregions" for California
  http://knb.ecoinformatics.org/knb/metacat?action=read&qformat=nceas&sessionid=&docid=bowdish.58

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Improving Watershed Health through Large-Scale Wetland Restoration

Lorraine Parsons and Greg Kamman, Point Reyes National Seashore

Wetlands are believed to play many important functions for both wildlife and humans. However, these functions are lost when wetlands are developed or altered. Tomales Bay, located 30 miles north of San Francisco Bay, lost 50% of its wetlands in the 1940s when a large marsh was leveed for a dairy ranch operation. In 2000, the National Park Service bought this dairy ranch and began planning for a 613-acre wetland restoration project. In 2007-2008, Point Reyes National Seashore (Seashore) restored hydrologic connectivity to the Giacomini Ranch by removing levees, tidegates, and culverts; realigning leveed creeks; filling drainage ditches; and constructing new tidal channels.

The Park Service believed that restoration could not only improve the quality of the remaining degraded wetlands within the ranch, but improve overall watershed health by increasing habitat for both resident and migratory wildlife, as well as improve downstream water quality. While Tomales Bay is often viewed as pristine and is a Ramsar Wetland of International Importance, its waters have been impacted by leaking septic tanks, agriculture, and mercury and are designated by the state as impaired under Section 303(d). Two-thirds of the Bay's freshwater input -- the principal contaminant source -- comes from tributaries upstream of the Giacomini Ranch, which will now be able to be filtered by the reconnected floodplains.

To determine success of restoration in improving wetland functionality, the Park Service developed an innovative long-term monitoring program is being conducted prior to and after restoration in both the Project Area and reference wetlands. Monitoring two years after restoration indicates that many of the improvements anticipated over the long-term after the former pasturelands evolved into salt marsh wetlands are already beginning to occur, including increases in wildlife use; changes in the type of wildlife using the Project Area; substantial reduction in pollutant concentrations; and active conversion of the old pastures by establishment of common and uncommon salt marsh plants. Concentrations of pathogen indicators and nutrients have dropped dramatically, and a shift is occurring in invertebrate assemblages, which may be a factor in the increased numbers of shorebirds and waterfowl that have been using the restored wetlands since levees were breached. In addition, the newly restored wetlands are being colonized by or supporting increased abundances of special status species, both animal and plant.

Based on many of these factors, functionality of the restored wetlands is evolving much faster than was originally expected. Looking to the future, the Seashore and its watershed partners would like to extend this

analysis to determine the extent to which restoration is not only improving conditions in the Project Area, but in the watershed as a whole.

For more information:
Website:

- http://www.nps.gov/pore/parkmgmt/planning_giacomini_wrp.htm

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Data Analysis, Synthesis, and Reporting of Long Term Datasets with High Annual Population Variability: A Review of the SFAN Salmonid Monitoring Program

Mike Reichmuth, I&M Program

The National Park Service (NPS) Inventory and Monitoring Program is currently monitoring populations of coho salmon (*Oncorhynchus kisutch*) in watersheds within and adjacent to NPS lands in Marin County, CA. This program currently uses the Salmonid Monitoring Protocol for the San Francisco Bay Area Network (Reichmuth et al 2010) to obtain observational data made over multiple life stages and currently has continuous datasets using approved methods since 1997. Long term datasets were summarized and analyzed using linear mixed models for trend (Piepho and Ogutu, 2002). Although some datasets were not used for trend analysis, these data were used for multiple life stage analyses to determine mortality rates between life stages and possible habitat constraints. The NPS coho monitoring program serves as an example of how multiple life stage monitoring can support science based management decisions to help protect coho populations in the face of extinction.

For more information:
Website:

- http://www.sfnps.org/coho
- http://www.sfnps.org/coho/monitoring_protocol_summary

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Synthesizing Vital Signs Data to Address Salmon Related Management Needs

Alicia Torregrosa, Mary Ann Madej, and Andrea Woodward U.S. Geological Survey

In central and northern California, populations of coho, Chinook and steelhead salmon have been in decline for years, and have been listed as threatened or endangered under the Endangered Species Act. Although these populations spend up to 50 percent of their lives, and experience 90 percent of their growth in the ocean, critical life stages occur in habitat protected by three national parks in the San Francisco (SFAN) and Klamath (KLMN) networks. The quality of in-stream habitat is a function of the interaction of climatic variables and disturbance processes over various time frames, channel morphology, biotic interactions, legacy and current effects of human activities, and restoration efforts. Effective management of this habitat requires understanding the strength of relationships among factors in this complex, multivariate system. We are investigating the efficacy of using a combination of univariate and bi-variate analyses and structural equation models to integrate data collected by the SFAN and KLMN NPS Vital Signs program with other available data to meet this need. Interim results are organized around a conceptual model of the ecosystem and include descriptions of trends in critical factors, relationships between vital signs, and a website for downloading climate analyses for each park. The outcome will help managers prioritize monitoring and restoration efforts and anticipate the potential consequences of climate change.

For more information:
Website:

- http://prismmap.nacse.org/klamath/

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SOD Monitoring

Alison Forrestel, Point Reyes National Seashore

Since 2007, Point Reyes National Seashore (PRNS) staff, in conjunction with UC Berkeley, have been monitoring the effects of Sudden Oak Death (SOD) on the Douglas-fir and coast redwood forests of PRNS. Sudden Oak Death is caused by the non-native pathogen, *Phytophthora ramorum,* and kills oaks and tanoaks (Rizzo and Garbelotto 2003, Rizzo et al. 2005). Tanoak mortality rates have been estimated at 5% per year and, due to low levels of genetic resistance, it is likely that tanoaks will be functionally extirpated from coastal forests as a result of this disease (McPherson et al. 2010). This research is focused on the ecological impacts of SOD including regeneration, changes in forest structure and changes in fuel loads. Preliminary results indicate that disease spread is more rapid in Douglas-fir than tanoak forests and that fuel loads are increasing more substantially in redwood forests.

For more information:
References:

- McPherson, B., S. Mori, D. Wood, M. Kelly, A. Storer, P. Svihra, and R. Standiford. 2010. Responses of oaks and tanoaks to the sudden oak death pathogen after 8 y of monitoring in two coastal California forests. *Forest Ecology and Management* in press.
- Rizzo, D., and M. Garbelotto. 2003. Sudden Oak Death: endangering California and Oregon forest ecosystems. *Frontiers in Ecology and the Environment* 1:197-204.
- Rizzo, D., M. Garbelotto, and E. Hansen. 2005. *Phytophthora ramorum*: Integrative research and management of an emerging pathogen in California and Oregon forests. *Annual Review of Phytopathology* 43:309-335.

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Measuring Surface Current in Real Time along the GGNRA/PRNS Region

Toby Garfield, San Francisco State University

The California State Coastal Ocean Currents Monitoring Program (COAST) has established an array of shore-based instruments to measure the coastal ocean surface currents throughout California. The GGNRA has been an essential partner in this effort since nine sites are on GGNRA/PRNS lands. Since installation started in 2005 the system has been used in search and rescue, debris tracking, oil spill tracking, bird feeding patterns, pollution monitoring, Marine Protected Areas studies as well as basic scientific research. Surface currents are posted on the web with hourly updates (http://cordc.ucsd.edu/projects/mapping/maps/) and as movie loops for the past 24 hours (http://www.norcalcurrents.org/COCMP/Real-Time%20Currents.html). The second link is for both the Gulf of the Farallones and for San Francisco Bay. The surface current data are relevant for the Monitoring and Trend Detection and Oceans Science and Stewardship themes. This presentation will describe the COCMP system and demonstrate access to the data for a number of applications relevant to the National Parks in the San Francisco Bay area.

For more information:
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- http://www.cocmp.org/

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Bridging the Gap: Improving Science Communication in the San Francisco Bay Area Network

Michelle O'Herron, SFAN Inventory & Monitoring Program and Golden Gate National Parks Conservancy

Following the completion of a natural resource communication plan last fall, the San Francisco Bay Area Network (SFAN) has been making great strides in improving the way information is shared throughout the network and with park partners. Through partnerships with natural resources and interpretation staff, the I&M Program, the Pacific Coast Science and Learning Center, and park non-profits we have:

- undertaken a major initiative to create a one-stop-shop website to house natural resource information;
- increased the number and breadth of participants in the annual natural resources and science symposium;

- expanded and improved the monthly natural resources update;
- worked with interpretation staff to develop subject-specific resource briefings that appeal to a wider audience;
- increased the number of multimedia products produced; and
- developed a plan for how to get information to partners in a way that supports dissemination through social media channels.

For more information:
Reference:

- O'Herron, M. 2009. San Francisco Bay Area Network natural resources communication strategy. Natural Resource Report NPS/SFAN/NRR—2009/169. National Park Service, Fort Collins, Colorado.

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Temporal Trends in Fish Size, Abundance, and Recruitment during a Four-Year Time Period at Cordell Bank National Marine Sanctuary

Dale Roberts, NOAA/Cordell Bank National Marine Sanctuary

Cordell Bank is the gemstone of Cordell Bank National Marine Sanctuary, one of 14 undersea regions recognized by NOAA for their significant natural or cultural resources and managed for their protection. The National Marine Sanctuaries Act specifically calls for long-term monitoring of Sanctuary resources to provide management with a basis for the assessment of Sanctuary health. During the fall of 2002 the Sanctuary conducted a submersible survey on the Bank as the first step in an anticipated long-term monitoring effort. Shortly after this survey, the Pacific Fishery Management Council implemented commercial and recreational Rockfish Conservation Areas for the region which includes Cordell Bank. Subsequent submersible surveys in 2003, 2004 and 2005 offered the opportunity to observe the effect of the area closure on the icththyofauna of Cordell Bank. Temporal trends observed for some of the numerically dominant rockfish species were consistent with expected responses to a fishery closure while numerical density and sizes of other species showed no readily discernable temporal trend. Possible confounding and interacting factors influencing the observed temporal trends include episodic recruitment of juveniles and immigration of adults.

For more information:
Reference:

- Anderson, T.J., Syms, C., Roberts, D.A. and Howard, D. 2009. Multi-scale fish-habitat associations and the use of habitat surrogates to predict the organization and abundance of deep-water fish assemblages. *Journal of Experimental Marine Biology and Ecology*. 379 (1-2): 34-42.

Websites:
- Cordell Bank NMS Website http://cordellbank.noaa.gov/science/welcome.html
- National Marine Sanctuary Program SIMoN Website "Cordell Bank Habitat Characterization and Biological Monitoring" http://sanctuarysimon.org/cordell/sections/fisheries/project_info.php?projectID=88&sec=f

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Post-Restoration Plant Community Assembly Patterns on the Giacomini Wetland Restoration Project

Amelia Ryan, Point Reyes National Seashore

The 600-acre Giacomini Wetland Restoration Project, completed 2 years ago, offers an opportunity to examine the way in which plant communities form (or "assemble") after restoration. We looked at several factors, including distance from channel, elevation, salinity, and soil disturbance during restoration, to evaluate what drove plant community assemblage. Initial data suggest that the main driver of plant community assembly was elevation, but that soil disturbance also had significant effects. In addition, the site appears to be undergoing succession: Atriplex triangularis, which dominated many areas the first year, was much less common the second year. While overall species diversity is still much lower than the reference site, it has increased significantly since year one, with species richness approaching that of the reference site. By comparing this site to a reference marsh, we are able to evaluate its trajectory towards a "desired" future condition and offer lessons for other restoration projects.

For more information:
Website:

- Project's website: http://www.nps.gov/pore/parkmgmt/planning_giacomini_wrp_restoration.htm

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Marine Science Communication

Hugo Selbie, National Marine Protected Areas Center

The art of marine science communication in the 21st century extends well beyond the scope of student focused outreach and education. By communicating scientific results and findings in accessible accurate and objective formats scientists can have wide reaching effects by establishing simple connections for policy makers, stakeholder groups and other interested parties. Communication media such as informational booklets, video, and web based tools like Google Earth and social networking can serve science communication far more effectively than traditional policy based papers and peer review reports by engaging and exciting the audience.

Traditionally, scientists have been skeptical about communicating research through non-peer review avenues for a number of reasons; most markedly because non-peer reviewed information is often seen as advocacy not impartial research. Similarly policy makers are loath to read pages of technical scientific reports that may or may not answer their appropriate resource management question. However If ecological knowledge is to be better integrated into public policy and management choices, there has to be effective communication and collaboration between marine scientists and the people who develop the policies and manage the resources.

The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has been sharing knowledge obtained from 10 years of coastal ocean monitoring so ocean managers and policy makers can take science-based decisions regarding coastal and marine stewardship. One of the key areas of the PISCO program is the dissemination of our data through accessible avenues, by engagement in public led stakeholder processes, collaboration with partners and effective communication through our website PISCOweb and publications such as Coastal Connections PISCO science booklets. This commentary summarizes ideas, and lessons learned generated from 10 years of collaborative and innovative science – policy communication provided by PISCO.

For more information:
Websites:

- http://www.mpa.gov/dataanalysis/mpainventory/
- http://www.mpa.gov/dataanalysis/

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Early Detection Invasive Plant Species Occurrences and Spatial Characteristics in Golden Gate National Recreation Area

Robert Steers, SFAN Inventory & Monitoring Program

Since 2007, the San Francisco Area Network, Inventory and Monitoring Program has collected data on invasive species occurrences in Golden Gate National Recreation Area (GGNRA) through its Invasive Species Early Detection Program (a.k.a. Weedwatchers). The species that are being monitored are not necessarily ones that are already well-known for their ecological and/or economic impacts, but are species that have been determined by park staff to have a high potential of being problematic yet are still in an early stage of invasion. So far, this work has collected over 2000 occurrences of target invasive species. The number of new occurrences each year has not declined yet almost all of the trails and roads have been surveyed, some more than twice. Separate analyses of detection rates for each species reveals that for some, we have likely found most of the extant populations and they do not appear to be colonizing new areas readily. However, the rate of detection for other species shows that new occurrences are either steady or climbing, which implies that these species may be more problematic if left uncontrolled. Separate analyses of the spatial distribution of early detection occurrences also confirms that subwatersheds in close proximity to urban settings have higher invasive species richness and a higher number of invasive plant occurrences than areas in more natural settings, regardless of survey effort. Continuation of these surveys in the future will improve our understanding of invasive species patterns and will be used to maximize the effectiveness of control efforts.

For more information:

References:

- Crall, A.W, G.J. Newman, C.S Jarnevich, T.J. Stohlgren, D.M. Waller, and J. Graham. In Press. Improving and integrating data on invasive species collected by citizen scientists. *Biological Invasions* DOI 10.1007/s10530-010-9740-9.
- Gavier-Pizarro, G., V.C. Radeloff, S.I. Stewart, C.D. Huebner, and N.S. Keuler. 2010. Housing is positively associated with invasive exotic plant species richness in New England, USA. *Ecological Applications* 20:1913–1925.
- Sullivan, J.J, S.M. Timmins, and P.A. Williams. 2005. Movement of exotic plants into coastal native forests from gardens in northern New Zealand. *New Zealand Journal of Ecology* 29:1-10.

Websites:

- http://whatsinvasive.com/ (select "Golden Gate N.R.A." from the park drop-down list)
- http://www.weedwatcher.org

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Harnessing the Power of Pictures

Jessica Weinberg, SFAN Inventory & Monitoring Program

Many of us throughout the National Park Service document our work with digital photos. Others are constantly in need of images for reports, interpretive materials, or websites. For the benefit of both, the San Francisco Bay Area Network (SFAN) Inventory and Monitoring Program is exploring several ways of enhancing its digital image workflow. It is examining techniques for taking more impactful photographs, choosing the best images for publication and writing effective captions and keywords. To ensure that these efforts are never wasted and that valuable visual resources remain accessible long into the future, SFAN is also considering the use of IPTC metadata to describe, organize and manage its digital photo collections. Software options such as Abander PhotosControl and Microsoft Pro Photo Tools are being considered, as are IPTC metadata use guidelines that meet the NPS Digital Photo Metadata Standard and are intuitive for photographers and image users alike.

For more information:

Websites:

- Image Databases. http://www.controlledvocabulary.com/imagedatabases/
- Lowrie, Charlotte. What Makes a Photo Good? http://wordsandphotos.org/Commentary/WhatMakesAPhotoGood.htm
- Mortenson, Dorothy. Overview of Photo Management. Power Point Presentation. Prod. Southwest Alaska Network. April 2008.
- NPS Digital Photo Metadata Standard. http://npsfocus.nps.gov/docs/guide/metadata/MetadataStandards.html

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