

# US DOI 2009 RESTORATION PROGRAM

National Workshop April 1, 2009

(Presentations to be available on: [USGS](#))

- *Perspective on the Past, Present and Future of the DOI Restoration Program*
- Revisions to the CERCLA Damage Assessment Regulations
- Ecosystem Services in the Context of NRDAR
- Issues and Next Steps on Restoration Up Front/Restoration Banking
- Restoration Monitoring

**US DOI 2009 RESTORATION PROGRAM**  
**National Workshop April 1, 2009**

***Perspective on the Past, Present and Future of  
the DOI Restoration Program***

Willie Taylor

DOI Acting Deputy Assistant Secretary—Policy and  
Program Management; and Director of the Office of  
Environmental Policy and Compliance (OEPC)

# Taylor – Perspective on Restoration Program

- Original 1986 CERCLA NRD Rules stressed process and study requirements
- October 2008 rule revision embraces changes brought about by OPA that focus more on cooperative assessment and restoration-based compensation
- Coordination efforts among co-trustees generally reap more benefits for the resources than each trustee going its own separate way in search of a settlement
- Early on, focus naturally on damage assessment tools and procedures, both ecological and economic
- These techniques and processes, while important, only set stage for the ultimate goal – RESTORATION

# Taylor – Perspective on Restoration Program

- Evolution in Program name to the Restoration Program reflects emphasis shift
- Increased restoration focus led Program to create and then increase staff for Restoration Support Unit in Denver and to add restoration ecologist to USGS support team in Columbia, MO
- Evolution continued with October 2008 rule revision's new provisions fostering restoration-based approach for conducting damage assessments
- Follow-up to rule revision: Focus on **guidance** to implement revised regulations and **additional technical workshops** to inform guidance on economic methodologies, technical damage assessment topics, restoration success monitoring, etc.

# Taylor – Perspective on Restoration Program

- Evidence of restoration focus increase: In last three years, from 2006 through 2008, moved \$95 million dollars onto ground for restoration (equals the total restoration expenditures from 1992 through 2005)
- Value of increase: Since 2005, restoration has involved almost 70,000 acres of habitat and hundreds of miles of stream and shore line
- Importance of increase: Restored habitat supports endangered species and migratory birds and fish; is on public lands (State and Federal); and on Tribal lands, habitat provides or is associated with the important Tribal cultural resources and values
- Strong “Lesson Learned”: Habitat has been conserved through partnerships with trustees, industry, local landowners and non-governmental groups

# US DOI 2009 RESTORATION PROGRAM

## National Workshop April 1, 2009

### **Ecosystem Services in the Context of NRDAR**

- *Ecosystem Services: How People Fit Into the Landscape*, Bruce Peacock, NPS
- *EPA's Ecosystem Service Research Program: Overview and Opportunities*, Wayne Munns, EPA Office of Research and Development/Narragansett, RI
- *Square Pegs and Round Holes: Adventures in Finding Restoration Projects with a Nexus to the Injury*, Steve Hampton, Office of Spill Prevention and Response, CA Department of Fish & Game/Sacramento, CA
- *Using Ecosystem Service Models to Assess Land Use Impacts and Land Use Options*, Kari Vigerstol, Ecosystem Services Team, The Nature Conservancy/Seattle, WA

# How are ecosystem services valued?

- Types of ecosystem values
  - **Use values:** values derived from physical interaction with ecosystems
    - Values for fishing, hiking, wildlife viewing
  - **Non-use values:** values derived independently from physical interaction with ecosystems
    - Values for existence and preservation

# How are ecosystem services valued?

- Fundamental economic approach
  - Assign economic values according to the ability of resources to satisfy human needs
    - Anthropocentrism without apology!
    - Key determinants of economic value
      - **Preferences:** resources provide services that people demand and appreciate to various degrees
      - **Scarcity:** abundant resources are better able to provide services than scarce resources
  - Economic valuation of ecosystems follows this fundamental approach

# How are ecosystem services valued?

- Economic valuation methods
  - ***Revealed preference methods***: observe people making binding choices regarding real alternatives
    - Cannot estimate non-use values
    - Cannot value un-experienced scenarios
  - ***Stated preference methods***: observe people making non-binding choices regarding constructed alternatives
    - Can estimate non-use values
    - Can value un-experienced scenarios
    - Concern about “hypothetical bias”

# How about equivalency methods?

- Based on the same fundamental economic approach as valuation methods
- Equivalency methods do not measure values
  - Assume equal unit values for injury and restoration
  - Important to consider the services replaced through restoration vis-à-vis the services lost through injury
    - Type
    - Quality
    - Comparable value (landscape setting)

# Suggested References

- <http://www.ecosystemvaluation.org>
- King, D.M., L.A. Wainger, C.C. Bartoldus, and J.S. Wakeley. “Expanding Wetland Assessment Procedures: Linking Indices of Wetland Function with Services and Values.” Engineer Research and Development Center, U.S. Army Corps of Engineers, September 2000.
- (end of Peacock)



## ECOSYSTEM SERVICES RESEARCH PROGRAM

BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

[www.epa.gov/ecology](http://www.epa.gov/ecology)

# *EPA's Ecosystem Service Research Program: Overview and Opportunities*

Wayne R. Munns, Jr.  
US Environmental Protection Agency  
Office of Research and Development

# Presentation Objectives

- Motivations
- Ecosystem services
- Ecosystem Services Research Program
  - goals & objectives
  - organization
  - expected outputs & outcomes
- Opportunities for partnership



## EPA's Motivations

- Increasing recognition that our health, well-being & economy depend on functioning ecosystems
- Ecological risks currently managed in piecemeal fashion – single media, single stressor & isolated scale of analysis
- Decisions almost always involve tradeoffs
- Increasing need to understand, balance & communicate tradeoffs of environmental policies & decisions
- Shift in accountability from administrative process to environmental outcomes
- Current states of the science & practice limit EPA's ability to quantify tradeoffs comprehensively

# ESRP Goals & Objectives

## Vision

A comprehensive theory and practice for quantifying ecosystem services, their value and their relationship to human well-being, is consistently incorporated into environmental decision making

## Goal

Transform the way we understand and respond to environmental issues by making clear the ways in which our management choices affect the type, quality and magnitude of the services we receive from ecosystems

## Five Primary Program Elements

- Keeping the end in mind: integration, decision support & outreach
- Monitor, inventory, map & model ecosystem services at multiple scales
- Pollutant-specific studies: effects of reactive nitrogen on ecosystem services
- Ecosystem-specific studies: ecosystem services provided by wetlands & coral reefs
- Place-based studies: five places from urban to regional, with wide-ranging issues

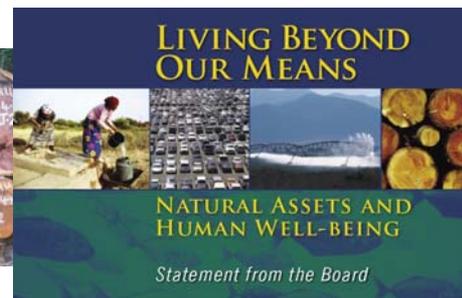


## Major Outputs

- Spatial inventories derived from advanced applications of landscape ecology, spatial analysis & monitoring
- Predictive models to forecast change
- Management options under alternative future scenarios
- On-line **Decision Support Platform** enabling decision makers to evaluate management alternatives using ecosystem services and human health & well-being outcomes

## Intended Outcomes

- Informed environmental policy based on ecosystem services
- Voluntary stewardship activities
- Consistency in ecosystem service assessments through use of standardized units & methods
- Credible foundations for market incentives



## Some Opportunities

- Building on momentum of SETAC Pellston Workshop on Nexus of ERA & NRDA – a focus on ecosystem services
- Sharing knowledge & data, partnering at sites of opportunity
- Enhancing the science supporting translation of injury to service losses



## For Information & Feedback

### Web sites

<http://www.epa.gov/ecology>

<http://www.epa.gov/ord/npd>

### Science Connector

<http://portal.epa.gov/ESC>



# Square Pegs and Round Holes: Adventures in Finding Restoration Projects with a Nexus to the Injury

Steve Hampton  
California Department of Fish and Game

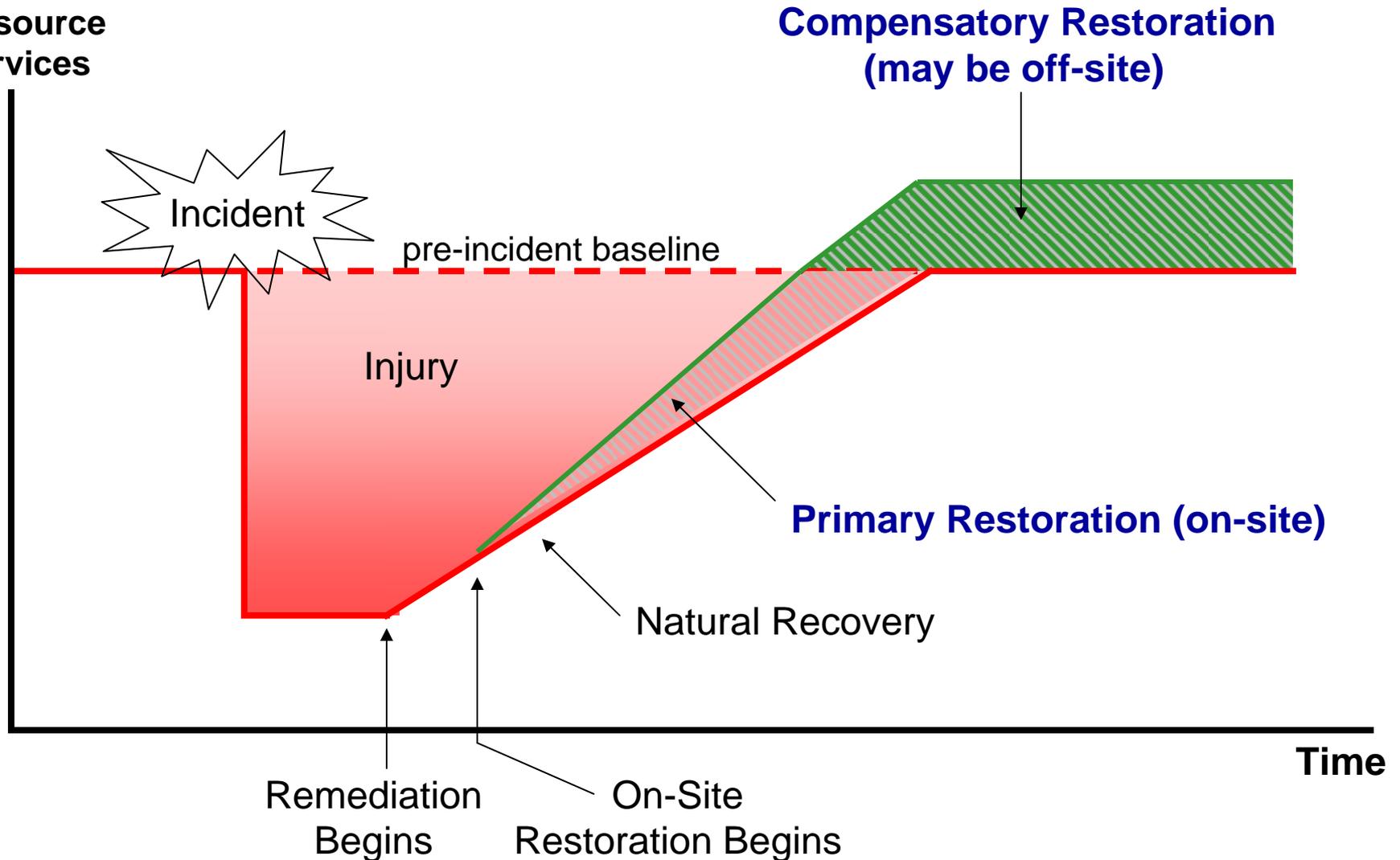
April 1, 2008  
DOI NRDAR Workshop  
Phoenix, AZ



# The Mission of NRDA

*“to restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources”* ~43 CFR 11.82

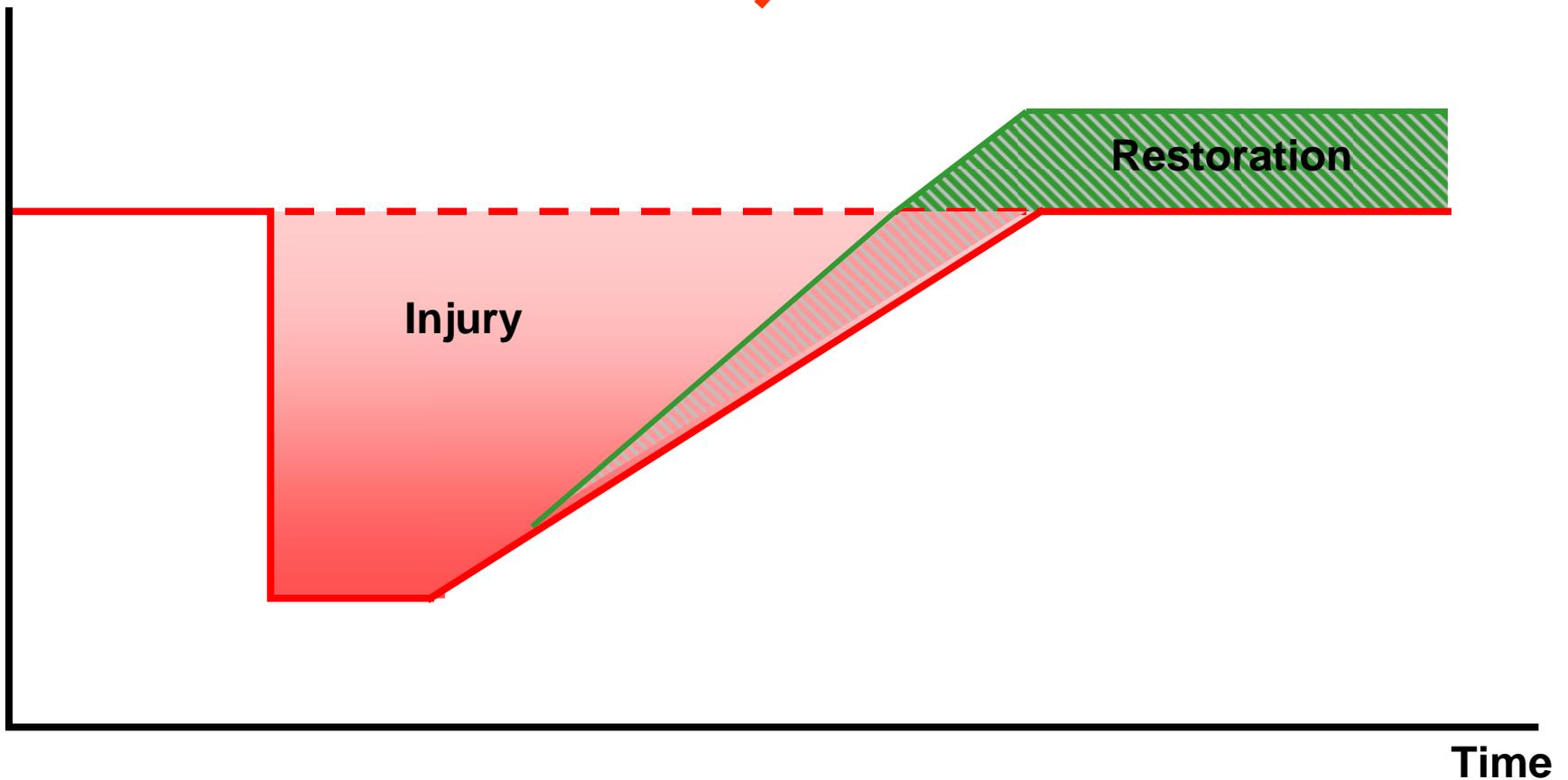
Level of  
Resource  
Services



# Services: Our Unit of Currency

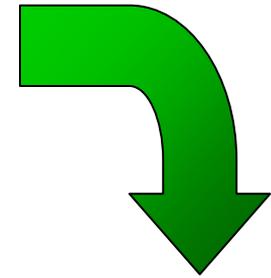
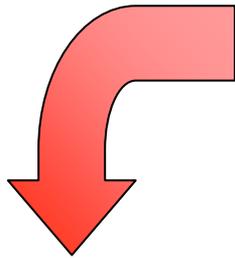
## Habitat/Resource Equivalency Analysis

~~(value)~~ x (resource services injured) = ~~(value)~~ x (resource services restored)



Level of  
Resource  
Services

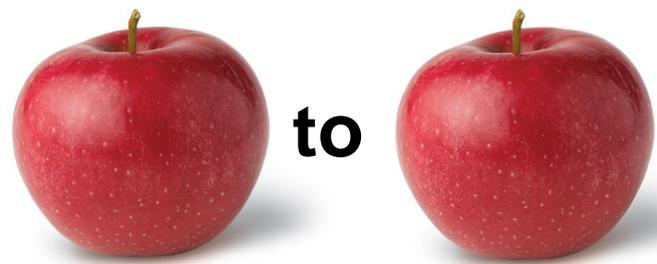
# *Nexus*



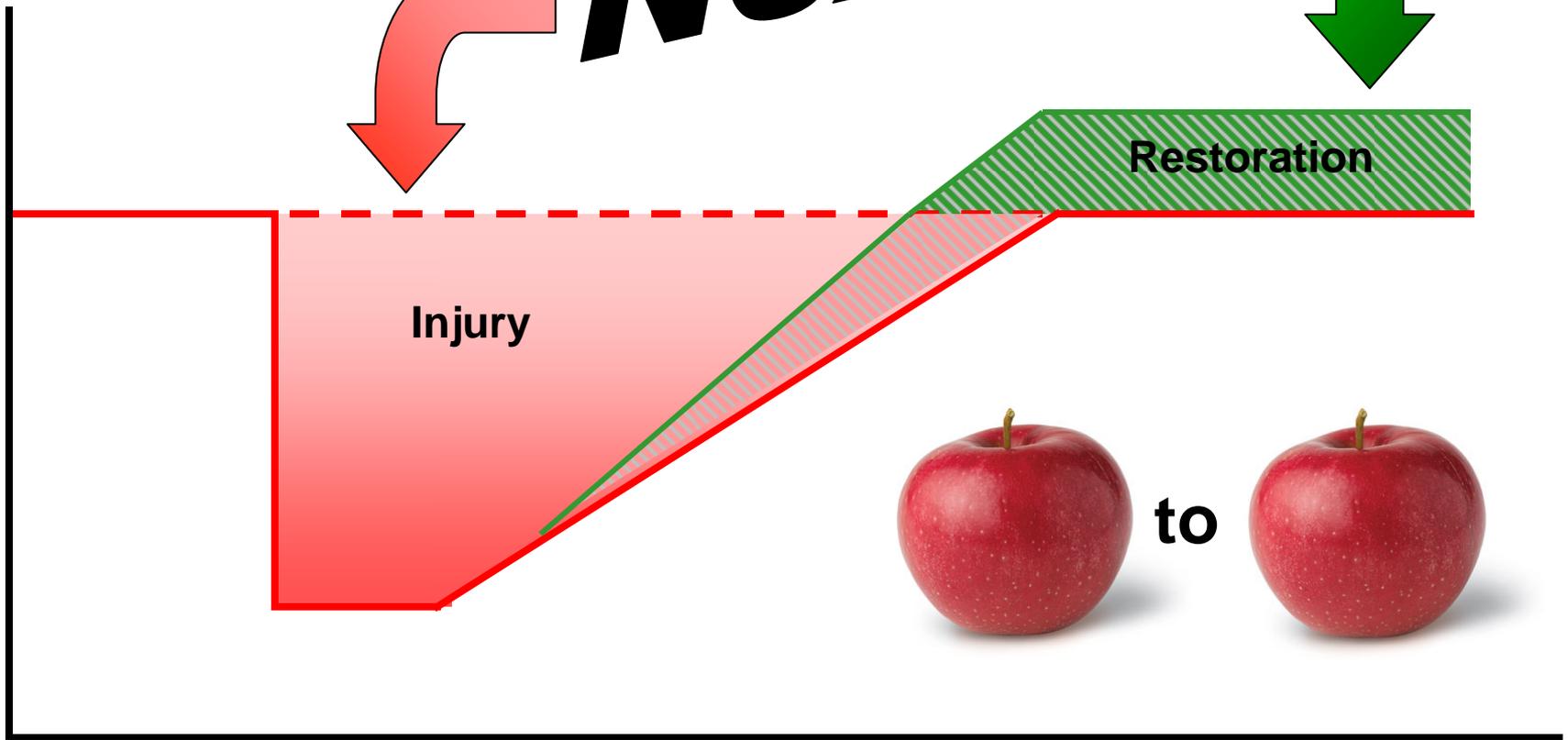
Restoration

Injury

to



Time



Category: Grebe/Loon Nesting Habitat

Project: Protection of Western/Clark's Grebes Nesting Colonies at Northern California Lakes



**Note: Bird rehab often does not meet restoration criteria.**

## ATTENTION BOATERS AND FISHERMEN

This lake provides vital nesting areas for Western and Clark's Grebes from

▶▶▶ **MARCH to SEPTEMBER** ◀◀◀

We need **your** help to protect Grebe nesting colonies!

- Please...
- Avoid nesting areas. (found in tule and bulrush beds)
  - Stay 300 feet away from colonies.
  - Minimize boat wakes. (which can swamp nests)
  - Avoid boat strikes: watch for grebes in open water.
  - Respect speed limits and buoy markers.
  - Clean up fishing line and other trash.
  - Educate others about protecting grebes.

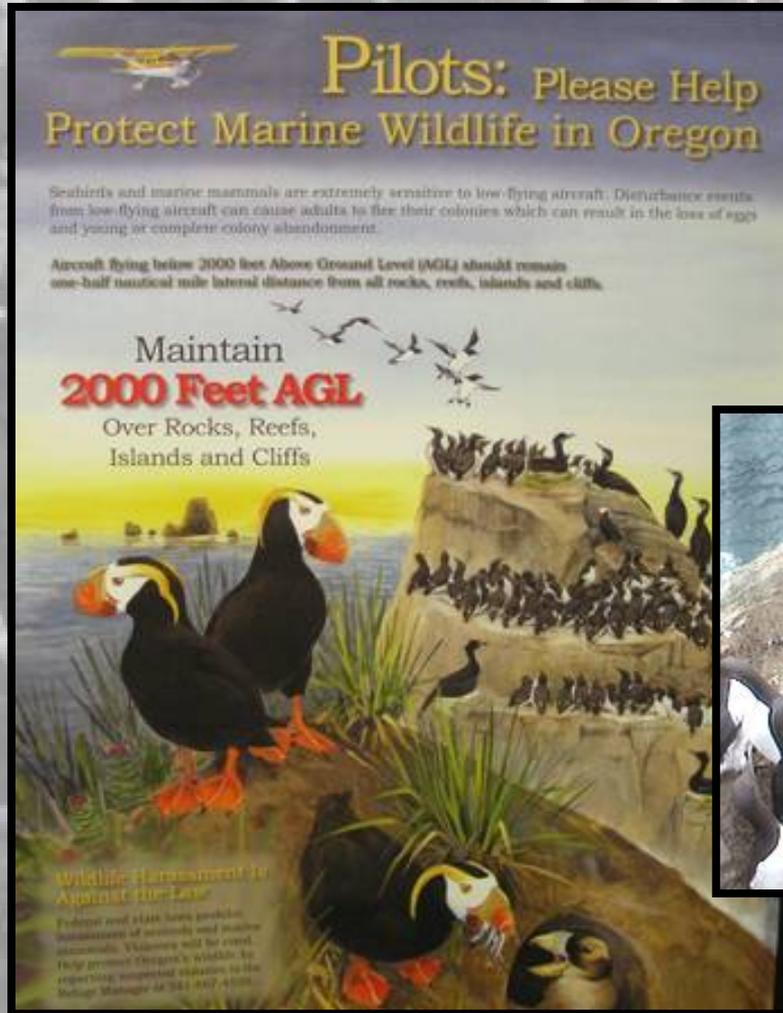


Please help these shy, elegant birds to recover their numbers after years of pollution and persecution. Thank you.

**Public education and protective buffers around nesting colonies, for 10 years**

Category: Rocky Seabirds

Project: Redding Rock Murre Colony Restoration



**Education, enforcement, social attraction and disturbance protection at a vulnerable Common Murre colony.**

# Conclusions

1. Finding good projects with a good nexus fulfills our mission and is a requirement of Habitat/Resource Equivalency Analysis.
2. Finding good projects takes creativity and a willingness to be adventurous.
3. Trustee teamwork and good legal support (e.g. in Consent Decrees and Restoration Plans) will help protect our mission.



# Using ecosystem service models to assess land use impacts and land use options



# Millennium Ecosystem Assessment Ecosystem Service Categories

## PROVISIONING SERVICES

*Products obtained from ecosystems*

- Food
- Freshwater
- Fuelwood
- Fibre
- Biochemicals
- Genetic resources
- ...

## REGULATING SERVICES

*Benefits obtained from regulation of ecosystem processes*

- Climate regulation
- Disease regulation
- Water regulation
- Water purification
- Pollination
- ...

## CULTURAL SERVICES

*Non-material benefits obtained from ecosystems*

- Spiritual and religious
- Recreation and ecotourism
- Aesthetic
- Inspirational
- Educational
- Sense of place
- Cultural heritage
- ...

## SUPPORTING SERVICES

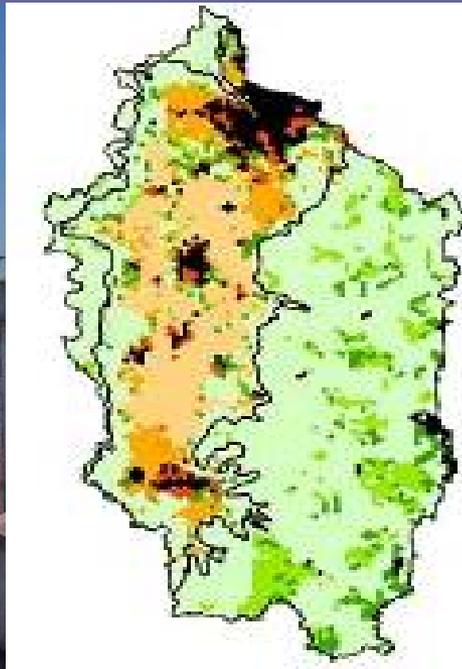
*Services necessary for the production of all other ecosystem services*

- Soil formation
- Nutrient cycling
- Primary production

LIFE ON EARTH – BIODIVERSITY

# Ecosystem Services Applications

- Payments for Ecosystem Services (PES)
- Planning
- Trade-off analysis



# Questions?



Kari Vigerstøl

The Nature Conservancy  
Seattle, WA office

[kvigerstol@tnc.org](mailto:kvigerstol@tnc.org)

# US DOI 2009 RESTORATION PROGRAM

## National Workshop April 1, 2009

### Issues and Next Steps on Restoration Up Front/Restoration Banking

- *Introductions and Overview*, Ted Maillett, FWS HQ/Arlington, VA
- *Overview of NOAA's Policies and Case Experience*, John Rapp, NOAA/Silver Spring, MD
- *FWS' Experience on the DuPont Newport Superfund Site in Delaware*, Sherry Krest, FWS/Annapolis, MD
- *Restoration Banking—A Private Perspective*, Wayne White, Wildlands, Inc.
- *Possibilities for a Restoration Bank Pilot Project for Multiple Small Oil Spills*, Suzanne Dudding, FWS/Tulsa, OK

# Restoration Banking

Part II

# Review of Last Year's Session

- Panel of experts discussed how banking and crediting can help meet program goals
  - Conservation Banking
  - Wetland mitigation banking
  - Credit trading in SO<sub>x</sub>, NO<sub>x</sub>, carbon
  - Water quality credit trading
- Panel considered some of the criteria thought necessary for a successful restoration banking program

# Session Goals

- Facilitate conversation on whether:
  - Where/how restoration banking makes the most sense
  - Restoration banking can help expedite the NRDA process
  - Restoration credits can/should be transferable?
  - FWS/DOI needs to begin develop policy and guidance on the role of restoration banks in the NRDA process

# Panel Members

- John Rapp (NOAA)
  - Will discuss NOAA's perspective, policy, and experience on restoration up-front of assessment and restoration credit trading
- Sherry Krest (FWS)
  - Will share her experience on Hay Road and the creation and use of excess credits
- Wayne White (Wildlands, Inc)
  - Will share his thoughts on how a third-party banker can benefit both Trustees and RPs in NRDA cases
- Suzanne Dudding (FWS)
  - Will talk about the need for an expedited NRDAR and whether, in her mind, restoration banking can be beneficially applied.

# What is Restoration Banking?

- Restoration Banking is the term used to describe a process whereby an entity gets “credit” for a restoration project and is allowed to use the “credits” to offset liability for damages to similar types of service losses.
- Restoration up-front of assessment
  - Involves restoration of injured resources prior to a settlement.
- Restoration before injury
  - Involves restoration of injured resources that are not directly associated with an active case.
  - Credits may then be transferred to third parties to offset NRDA liabilities under approval by Trustees.

# Potential Benefits of Banks

- Restoration of Trust resources can occur prior to settlement
- Restoration can occur prior to injury
- Large-scale cases could be pursued more cost-effectively
- Established 3<sup>rd</sup> party banks can minimize Trustee costs for long-term management and oversight

# Restoration Credits Issues that first must be resolved

- How to determine credits/service flows
- How to assign/distribute credit
- When are credits assigned?
- How to deal with human use credits?
- How to scale a project?
- What level of assurances do trustees and PRPs need to proceed?
- What documentation is needed?

# Answer Resources

- Existing NRDA practices
  - i.e., modified HEA/REAs
- FWS Guidance for the Establishment, Use, and Operation of Conservation Banks (2003).
- Habitat Credit Trading Partnership Agreement with the USDA NRCS and Association of Fish and Wildlife Agencies (2007).
- FWS Recovery Crediting Guidance (2008).

# Conservation Banking Guidance (2003)

- Credits typically denominated in “acres”.
- Credit assignment/distribution part of Banking Agreement
- Credits typically assigned when habitat becomes (fully) functional.
- Non-wasting endowments or escrow accounts fund the long-term viability of banks to cover management, monitoring, and potential remedial actions.

# Habitat Credit Trading Partnership Agreement

- Purpose is for collaboration and facilitation of the establishment of viable habitat credit trading markets that will result in net species conservation benefits for listed and other at-risk species.

# FWS Recovery Crediting Guidance

- This guidance provides a crediting framework for Federal agencies in carrying out recovery measures for threatened and endangered species.
- Agencies must show how adverse effects of their activities are offset by beneficial effects of actions taken elsewhere.
- The combined effect must show a net benefit to the recovery of the species.

# Necessary Criteria to Establish a Successful Restoration Bank

- Must be linked to similar resources as those injured
- Credit creation could result from:
  - Conservation banks or projects developed by responsible party prior to final settlement.
  - Targeted restoration actions that provide a level of services exceeding the responsible party's liability.
  - Existing conservation banks protecting similar types of injured resources

# US DOI 2009 RESTORATION PROGRAM

## National Workshop April 1, 2009

### Restoration Monitoring

- *Update from the SETAC Symposium on Restoration Monitoring*, Mike Hooper, USGS BRD/Columbia, MO & Sue Kennedy, DOI Restoration Program/ Lakewood, CO
- *Restoration Monitoring Primer*, Mike Hooper & Sue Kennedy
- *Global Restoration Network: Profile Development and Examples*, Robin Tillitt, USGS BRD/Columbia, MO
- *Case Study: Effective Monitoring in Restoration Management, Lavaca Bay NRDAR Case*, Ken Rice, FWS/Corpus Christi, TX
- *Update on the SETAC Pellston Workshop: “Nexus between Ecological Risk Assessment and Natural Resource Damage Assessment,”* Roger Helm, FWS HQ/ Arlington, VA

# April 2008 National Workshop

---

---

## Monitoring Session

- *Long-term vision*
- *Initial steps*
- *Roundtable discussion*



✓ April 2008 National Workshop

Bring attention to need for restoration monitoring and plans for NRDAR application  
Invitation to trustees to participate at SETAC

✓ SETAC 2008 Symposium  
Evaluating Restoration Performance

Introduction to a wide range of restoration projects and their monitoring processes

April 2009 National Workshop

Report on SETAC symposium, update and prepare for Technical Guidelines workshop

2010 Technical Guidelines  
Development Workshop

Application of lessons learned from symposium and trustee experiences to develop guidelines for restoration monitoring

Iterative Future Development

Incorporation of monitoring results into administrative, planning, training, and research priorities



# 2008 SETAC Special Symposium

## Restoration Monitoring

---

---

**Objective:** Bring together restoration practitioners to discuss strategies for, strengths, and weaknesses of restoration monitoring programs

**Combined presentations on:**

- use of ecological principles in developing restoration design and monitoring approaches
- restoration monitoring tools and approaches
- case studies of actual monitoring programs
  - simple qualitative assessment of success
  - well-planned and executed programs
  - programs with strong science components that applied adaptive management to ensure success and tested resilience and sustainability





April 2008 National Workshop

Bring attention to need for restoration monitoring and plans for NRDAR application

Invitation to trustees to participate at SETAC



SETAC 2008 Symposium  
Evaluating Restoration Performance

Introduction to a wide range of restoration projects and their monitoring processes



April 2009 National Workshop

Report on SETAC symposium, update and prepare for Technical Guidelines workshop

## 2009 Activities

- National Conference on Ecosystem Restoration – July 20-21
- Society for Ecological Restoration International – Aug 23-27
- SETAC “*Restoration of Sites Contaminated by Human Activities and Natural Disasters*” – Nov 19-23

2010 Technical Guidelines  
Development Workshop

Application of lessons learned from symposium and trustee experiences to develop guidelines for restoration monitoring



# Post-Restoration Monitoring: A Primer

**Mike Hooper**

**Columbia Environmental Research Center  
Columbia, Missouri**



# Assessing Success in NRDA-Associated Restorations

## Restoration Monitoring Basics

**Monitoring should be performed to determine if the goals of the restoration have been met.**

**Complexity of the restoration dictates the design and intensity of the monitoring program.**

**Generally ties back to the damaged resource and determines if ecosystem services have been recovered**

**Should be developed concurrently with restoration plan**

# Reference Sites

- A point of advanced ecosystem development that lies somewhere along the intended trajectory of the restoration.
- The restored ecosystem is eventually expected to resemble the attributes of the reference, and project goals and strategies are developed in light of that expectation.
- Often developed using multiple reference sites to develop normal bounds of ecosystem variability
- May require different reference sites for different ecosystem components (e.g., bird vs plant communities) as well as historical ecosystem data

# Monitoring of Ecological Restorations

Restorations Types Dictate Monitoring Needs

## Restoration of Damaged Habitats and Ecosystems

Monitoring plans developed during restoration planning

Define *Performance Criteria* and *Monitoring Milestones* that reflect objectives and goals of the restoration

Describe how performance criteria will be assessed – quantitative measures or qualitative observations

Create a monitoring schedule - who is responsible?

Define, as best as possible, minor and major corrective actions and their triggers

Define requirements for completion and final reporting

# Monitoring of Ecological Restorations

## Land Acquisition or Exchange

- Resource is so damaged site restoration is not pursued
- Alternative site chosen to replace lost ecosystem services

Sites with demonstrated ESs of similar value to lost site need confirmation of stability of resources

Others may need restoration to provide replacement of full ESs – similar to full site restorations

## Building or Replacement of Facilities

- Implementation fulfils goals of the project
- Completion to Performance Standards must still be documented

# Evaluating & Reporting Monitoring Results

**Process data from monitoring efforts and determine if site characteristics meet performance criteria and standards.**

**Assess shortcomings of findings and determine the need for corrective actions and adaptive management**

**Once site has returned to baseline or is on an appropriate trajectory toward reference conditions, sign off on completion, describing any long term site care & assessment needs and who is responsible for them.**

**Publish a summary of the work in a manner that is accessible to other researchers and the public (Factsheets), and in web-based resources or publications –**

**For example – The Global Restoration Network**



# **The Global Restoration Network**

## **A Project of the**

# **Society for Ecological Restoration &**

# **DOI's NRDA and Restoration Program**

**Robin Tillitt**

**USGS Columbia Environmental Research Center**

**Columbia, Missouri**

**U.S. Department of the Interior**  
**U.S. Geological Survey**

# Global Restoration Network (GRN)

Launched in 2007  
80,000 hits/month

The GRN is a free,  
comprehensive resource  
for all aspects of  
ecological restoration

Links projects, research  
and practitioners to  
facilitate exchange of  
information.

The screenshot shows the GRN website homepage. At the top, it features the logo and the text "GLOBAL RESTORATION NETWORK" and "A PROJECT OF THE SOCIETY FOR ECOLOGICAL RESTORATION INTERNATIONAL". Below this is a navigation bar with links for "email this page", "become a member", "contact us", "site map", and a search box. The main content area is divided into several sections: "HOME" with a "Welcome to the GRN" message; "This Week In The News" with a link to explore the Red Global de Restauración Ecológica; "RESTORATION RADIO" with a link to the SER International World Conference; "AUGUST 2007 SER Position Statement 'Climate Change'"; "PARKS CANADA Ecological Restoration in Protected Areas"; "MAY 2008 SER Briefing Note 'Ecosystem Approach'"; "OCTOBER 2008 SER Position Statement 'Reversing Ecosystem Fragmentation'"; and "DOWNLOAD SER/Island Press RESTORATION READER". On the left side, there are links for "DONATE NOW!", "CAREER CENTER", "BECOME A FRIEND/SPONSOR", "RESTORE weekly e-bulletin", and "GRN SPONSORS". At the bottom, there is a "CASE STUDIES" section with a photo of a forest.

The GRN database contains in-depth case studies, expert profiles,  
and restoration-related literature from around the world



[email this page](#)

[become a member](#)

[contact us](#)

[site map](#)

SEARCH

GO

HOME

DATABASE

Invasive Species

SUBMISSION  
FORMS

Case Studies

Experts

Organizations

Literature

RESTORATION

ECOSYSTEMS

DEGRADATION

COUNTRIES

FUNDING

CONFERENCES

EDUCATION

VOLUNTEER

VIDEO/AUDIO

ABOUT THE GRN

## Database

Please note that we are now in the process of populating the GRN database. Check back with us later if you do not find the results you are looking for.

The GRN Database employs an advanced search engine that allows the user to refine his or her query in order to obtain all relevant information on ecological restoration based on ecosystem (biome) type, geographical location and source of degradation. The results will include project case studies, a directory with links to experts and organizations in the field as well as a comprehensive bibliography.

We are currently soliciting your help in populating the GRN database with case studies, experts, organizations and literature...quick and easy to use forms provided in the navigation bar to the left allow you to make your submission online.

### ADVANCED SEARCH

|         |                                  |                |   |
|---------|----------------------------------|----------------|---|
| Biome   | <input type="text" value="All"/> | Ecosystem      | <input type="text" value="All"/>          |
| Region  | <input type="text" value="All"/> | Degradation    | <input type="text" value="All"/>          |
| Country | <input type="text" value="All"/> | Search Results | <input type="text" value="Case Studies"/> |

**Searchable database with inquiries by region, country, biome, ecosystem, cause of degradation**

# Case Studies

- Detailed description of project's main components with links to websites, photos, contact people, etc
- Involves mining data from various sources for a series of 30 questions and statistical needs
- Organized into sections that allow fast, easy retrieval of specific information



# GLOBAL RESTORATION NETWORK

A PROJECT OF THE SOCIETY FOR ECOLOGICAL RESTORATION INTERNATIONAL

A Project of the Society for Ecological Restoration

email this page | become a member | contact us | site map | SEARCH | GO

- HOME
- DATABASE
- Invasive Species
- SUBMISSION FORMS
- Case Studies
- Experts
- Organizations
- Literature
- RESTORATION
- ECOSYSTEMS
- DEGRADATION
- COUNTRIES
- FUNDING
- CONFERENCES
- EDUCATION
- VOLUNTEER
- VIDEO/AUDIO
- ABOUT THE GRN

## Case Study Detail

**Name** USA: California: Common Murre Restoration Project, Central California Coast, USA

**Executive Summary** Between January 28 and February 4, 1986, the oil transportation barge, APEX HOUSTON, discharged about 26,000 gallons of crude oil while in transit from San Francisco Bay to the Long Beach Harbor. The oil spill damaged seabirds and other aquatic life from Point Reyes to the Big Sur coast (Map, File 1). Approximately 9,000 seabirds were killed, including 6,300 common murres (Uria aalge; Carter et al. 2003). A trustee council, made up of representatives of the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and California Department of Fish and Game (CDFG), was established to review, select, and oversee implementation of restoration actions for natural resources injured by the spill. A Common Murre Restoration Project (CMRP) was developed with the goal to recolonize common murres at historic breeding colonies in the areas where they were extirpated or severely depleted by the oil spill. From 1996-2005, social attraction (decoys, mirrors and recorded vocalizations of common murres) was used to attract common murres to nest at Devil's Slide Rock and other historic nearshore colonies in the vicinity of San Francisco. Common murres are monitored at these sites and at reference sites in the vicinity of Point Reyes and Big Sur in order to evaluate and refine the recolonization project. Monitored parameters include colony size, reproductive success, behavior, and breeding phenology of common murres. In addition, anthropogenic factors (e.g., boat disturbance, aircraft overflights, oiling) and natural factors (e.g., predation, diet, climatic fluctuations) that affect the success of recolonization efforts have been documented. In 2005, after ten years of restoration efforts, the project had exceeded the goal of establishing 100 breeding pairs of murres at Devil's Slide Rock for six consecutive years and breeding by murres on the adjacent Devil's Slide mainland was also established.

**Biome** Coastal/Marine

**Ecosystem** Oceanic

**Original Ecosystem** The California maritime coast is characterized by the rocky headlands and islands abutting the cool continental shelf waters of the eastern North Pacific Ocean. California's marine environment from Monterey Bay to the Sonoma Coast and 32 km west of the Farallon Islands is one of the world's most productive ecosystems whose prolific fisheries support hundreds of thousands of breeding seabirds along the coast. The average annual rainfall is 19.7 inches, and temperatures range from an average of 41.5° F in January to 71.7° F in July.

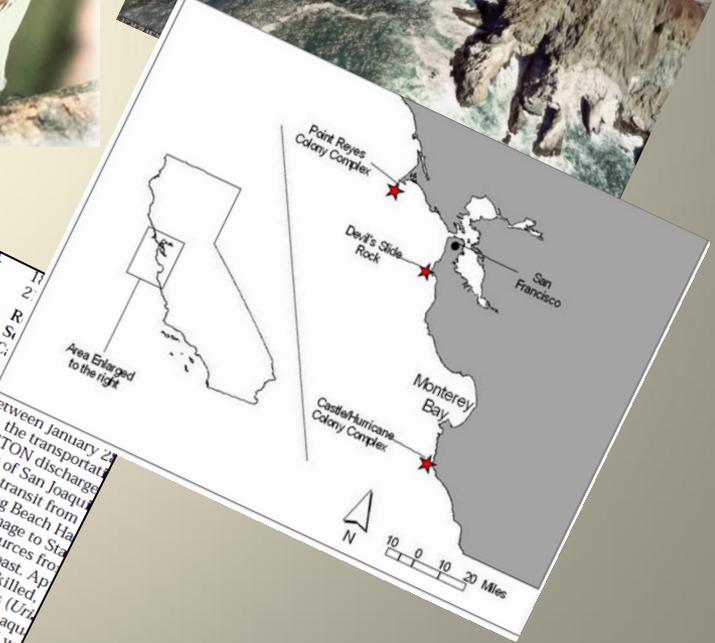
**Region** North America

**Specific Country** United States of America

**Area Covered** 250

**Area Units** Km of California Coastline

**Pre** Common murres are an important bird community (Carter et al. 2003).



**prbo** **Observer**

**A Murre Mystery**

*Emily Tupper*

The doozy northwest wind is here to greet me. It pushes my hair out of my face as I sleepily stomp up the rocky trail. Climbing up to avoid the rising I refuse to squint out morning sun like a victim of sagacious. Subdued with cautious smiles, take a deep breath, and continue to climb.

A few minutes later I reach for the door of a small shed-like structure, a bird blind that sits snugly into the rocks of the ridge. Once inside, I pop into a tooting mode. The single sound I'm in for is the sound of 15,000 Common Murres: the sound of wings flapping, the sound of feet tapping, the sound of heads bobbing, the sound of beaks clicking, the sound of wings flapping, the sound of feet tapping, the sound of heads bobbing, the sound of beaks clicking, the sound of wings flapping, the sound of feet tapping, the sound of heads bobbing, the sound of beaks clicking.

PRBO has been studying seabirds on the California coast since 1986. Compiling nearly 40 years of information on marine ecosystem change and the effects on seabird populations. The past two years of our study have revealed that the effects of the oil spill are substantial, and unusual landscape changes are occurring. Low production of young, substantially lower-than-normal survival rates, and unusual landscape changes are occurring. Low production of young, substantially lower-than-normal survival rates, and unusual landscape changes are occurring.

**Fish and Wildlife Service**  
**Notice of Availability, Final Apex Houston Oil Spill Restoration Plan**  
 Department of the Interior  
**ACTION:** Notice of Availability.

**SUMMARY:** The U.S. Fish and Wildlife Service (Service) herein releases the final Apex Houston Oil Spill Restoration Plan (Final Plan). The Final Plan describes the techniques, schedule, and budget for a project to restore natural resources injured as a result of an oil spill that killed approximately

between January 28 and February 4, 1986, the transportation barge APEX HOUSTON discharged about 26,000 gallons of crude oil while in transit from San Francisco Bay to the Long Beach Harbor. The oil spill caused damage to natural resources from the Big Sur coast. Approximately 9,000 seabirds were killed, including 6,300 common murres (Uria aalge; Carter et al. 2003). A trustee council, made up of representatives of the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and California Department of Fish and Game (CDFG), was established to review, select, and oversee implementation of restoration actions for natural resources injured by the spill. A Common Murre Restoration Project (CMRP) was developed with the goal to recolonize common murres at historic breeding colonies in the areas where they were extirpated or severely depleted by the oil spill. From 1996-2005, social attraction (decoys, mirrors and recorded vocalizations of common murres) was used to attract common murres to nest at Devil's Slide Rock and other historic nearshore colonies in the vicinity of San Francisco. Common murres are monitored at these sites and at reference sites in the vicinity of Point Reyes and Big Sur in order to evaluate and refine the recolonization project. Monitored parameters include colony size, reproductive success, behavior, and breeding phenology of common murres. In addition, anthropogenic factors (e.g., boat disturbance, aircraft overflights, oiling) and natural factors (e.g., predation, diet, climatic fluctuations) that affect the success of recolonization efforts have been documented. In 2005, after ten years of restoration efforts, the project had exceeded the goal of establishing 100 breeding pairs of murres at Devil's Slide Rock for six consecutive years and breeding by murres on the adjacent Devil's Slide mainland was also established.



# Benefits

- Demonstrate approaches and successes
- Increase exposure and make available as a resource
- Consolidate information to quickly reference or share with colleagues/clients
- Narrative submission form allows accuracy, flexibility and continual updating

# Summary

- Publically available documents and data
- Time demands to develop case study
- Showcase restoration projects
- Share knowledge and expertise

# **US DOI 2009 RESTORATION PROGRAM**

## **National Workshop April 1, 2009**

### **Revisions to the CERCLA Damage Assessment Regulations**

- *Introduction, Background, and Overview*, John Carlucci, DOI, Solicitor/DC
- *Economic Methodologies*, Bruce Peacock, National Park Service/Ft. Collins, CO
- *Technical Corrections and Compliance with Court Cases*, John Carlucci

# Overview

- CERCLA damage assessment regulations
  - 43 CFR Part 11
- Revisions promulgated October 2, 2008
- Revisions were not challenged in court
- This presentation will cover
  - FACA Committee
  - Restoration-Based Methods
  - Other Conforming Changes

# FACA Committee

- Key recommendation
  - Make targeted revisions to the CERCLA damage assessment regulations
    - Include “restoration-based” methods to determine compensable value
    - Do not sanction or bar any particular method
    - Establish general principles of reliability
  - Do not change regulation’s current focus on
    - Baseline
    - Causation
    - Services (ecological and human)

# Restoration-Based Methods

- Type B procedure revisions
  - Emphasize resource restoration over economic damages
    - Expand the definition of compensable value
    - Include restoration-based methods
    - Include feasibility and reliability factors

# Restoration-Based Methods

- Compensable Value
  - The amount of money required to compensate the public for:
    - *“The loss in services provided by the injured resources between the time of the discharge or release and the time the resources are fully returned to their baseline conditions, or until the resources are replaced and/or equivalent natural resources are acquired”*
    - Services: physical and biological functions performed by resources, including providing human use
    - Interim lost use

# Restoration-Based Methods

- Compensable Value (*cont.*)
  - Old regulations: measure using economic valuation
    - Includes methods that measure “consumer surplus”
    - Arguably excludes restoration-based methods such as the service-to-service approach in the OPA regulations
  - Trustees are required to spend compensable value recoveries on restoration actions
  - But under old regulations, trustees were not required to consider restoration actions to determine compensable value

# Restoration-Based Methods

- Compensable Value (*cont.*)
  - New revisions: two approaches to determination
    - Economic value, or
    - Restoration cost
  - No hierarchy of preference
  - Better comports with CERCLA's overall restoration objective
  - Promotes early focus on feasible restoration actions
  - Provides opportunities to design creative, cost-effective restoration actions

# Restoration-Based Methods

- Compensable Value (*cont.*)
  - Restoration cost approach
    - Cost to implement projects that restore lost services
    - These methods **scale** restoration projects and then estimate their implementation costs
      - Random utility maximization
      - Conjoint analysis
      - Habitat equivalency analysis
      - Resource equivalency analysis
      - Others that estimate the cost to restore in a cost-effective manner

# Restoration-Based Methods

- Unchanged: Acceptance criteria for compensable value methods
  - Feasibility and reliability
  - Reasonable cost
  - Avoidance of double counting
  - Cost effectiveness
  - ***All of these criteria remain mandatory***

# Restoration-Based Methods

- New: Feasibility and reliability factors to assist trustees in evaluating acceptance criteria
  - Is the method capable of providing useful information for a particular injury?
  - Does the method address the nature, degree, and spatial and temporal extent of the injury?
  - Has the method been peer reviewed?
  - Is the method generally accepted by experts in the field?

# Restoration-Based Methods

- Feasibility and reliability factors (*cont.*)
  - Is the method subject to standards?
  - Are the method's assumptions and inputs supported?
  - Are cutting edge methods tested or analyzed for reliability?
  - ***Not all of these factors need apply in every case***

# Other Conforming Changes

- Complying with *Ohio v. Interior*
  - Deleted the limitation on estimating option and existence value (i.e., non-use values)
- Responding to *Kennecott v. Interior*
  - Deleted the definition of the date of promulgation (1994) for statute of limitations purposes
  - Clarified that the metric for evaluating baseline conditions is the level of services provided

# Other Conforming Changes

- Timing guidance for the RCDP
  - Clarified that the RCDP may be completed after the injury determination and quantification phases of the assessment

# Summary

- The new revisions
  - Are the result of broad public input (FACA Committee)
  - Promote better restoration planning
  - Take care of needed “housekeeping”