Regional Ecosystem Frameworks (REFs):
Illustrations on the Use of REFs at Multiple Scales

May 31, 2012
1:00-2:30 p.m. Eastern

Presenters
- Karen Prentice, Bureau of Land Management
- Jimmy Kagan, Oregon Biodiversity Information Center, Institute of Natural Resources – Portland
- Amy Boyers, Houston-Galveston Area Council

Moderated by Mike Ruth, FHWA Office of Project Development and Environmental Review

Volpe The National Transportation Systems Center
Advancing transportation innovation for the public good

U.S. Department of Transportation
Federal Highway Administration
U.S. Department of Transportation
Research and Innovative Technology Administration
John A. Volpe National Transportation Systems Center
Regional Ecosystem Frameworks (REFs)

- Originally described in Eco-Logical
- A database of resources and scenarios with planning objectives and conservation criteria
- Require collaboration in ensuring data are compatible
- Engage a variety of stakeholders (representatives from local & State government, conservation, transportation, development, and planning organizations) to define, build, and maintain REF
Regional Ecosystem Frameworks (REFs)

- Existing conservation priority plans (scientifically robust, defensible, well reviewed and accepted)
- Individual priority resources not fully captured by existing priority areas
- Regional resource retention goals
- Resource viability requirements and responses to stressors
- Scenarios of current and future stressors, protected areas, management, etc.
BLM’s Landscape Approach and ECO-LOGICAL

Karen Prentice, BLM, Healthy Landscapes Coordinator, kprentic@blm.gov, 202-912-7223
Vision for BLM’s Landscape Approach

Develop business practices to manage resources and uses at multiple scales in the face of compounding stressors. **These practices will help the BLM and partners identify what to sustain, at what scale, and the associated trade-offs.**

<table>
<thead>
<tr>
<th>Traditional Practice</th>
<th>Landscape Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project and Site Focused</strong></td>
<td><strong>Landscape Focus</strong></td>
</tr>
<tr>
<td>Stove piped</td>
<td>Integrated</td>
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<tr>
<td>Tends to authorize uses and mitigate ecological values</td>
<td>Considers ecological values and use authorizations equally</td>
</tr>
<tr>
<td>Ecological Component (Individual Species)</td>
<td>Ecological Function and Service</td>
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**Develop new business practices to support this transition**

**Frame the issue:** Build conceptual models with conservation elements and change agents.
The Landscape Approach is based on management questions and an understanding of the system at each scale of interest. Here this understanding is represented by the blue circle and the scale is ecoregional.
Landscape Approach & Eco-Logical

- Build and Strengthen Collaborative Partnerships
- Scale Appropriate Monitoring for Adaptive Management
- Balance Predictability and Adaptive Management
- Rapid Ecoregional Assessments
  - Scale appropriate change agents.
  - Science Integration
- Scale Appropriate Field Implementation
- Design Projects Consistent with Regional Ecosystem Framework
- Ecoregional Direction
  - Identify Management Plans and Management Questions
  - Integrate Plans
  - Establish and Prioritize Opportunities
  - Document Agreements
- 10 REAs initiated to date
- 7 REAs covering more than 370 million acres will be completed in 2012
- Negotiations in progress for additional REAs this year
Management Questions

Conservation Elements + Change Agents = Management Questions

**EX:** Species
Habitat
Soils

**EX:** Invasive Species
Fire
Climate Change
Human Development

**EX:** Where is intact sage-grouse habitat threatened by climate change?

“what we want to conserve”

“what is threatening our resources”

“what land managers need to know”
Understanding the System: Conceptual Models

**CHANGE AGENTS**

Regional Climatic and Atmospheric Conditions
- seasonal regimes
- temporal spatial variability

**CONSERVATION ELEMENTS & STRESSOR INTERACTIONS**
(Vegetation, Wildlife, Soil Resources, Soil-Plant-Water Interface)

**Competition and Facilitation**

- Watershed
  - hydrologic function
  - riparian vegetation

- Landscapes
  - spatial configuration
  - landscape dynamics
Modeling Change Agents: Predicting Future status of conservation elements

Potential for Climate Change

Average (Fuzzy Union)

Potential for Temp & Hydro Change

Potential for Vegetation Change

Potential for Temperature Change

Potential for Runoff Change

Potential for Precipitation Change

Potential for Temp Change

Runoff Change from MAPSS

Potential for Winter Temp Change

Absolute Precipitation Relative Change

Potential for Summer Temp Change

Normalized Summer Temperature Change

Normalized Winter Temperature Change

Precipitation Change Ratio
Colorado Plateau: Potential for Vegetation Change

(L) MAPSS results showing just the pixels that changed to different vegetation types between historic baseline (1968–1999) and 2045–2060 based on MAPSS modeling for the Colorado Plateau ecoregion. (R) Digital elevation model of CP.
Colorado Plateau: Potential for Climate Related Change by 2060
MQ D6. Where is Gunnison sage-grouse vulnerable to change agents in the near-term horizon, 2025 (development, fire, invasive species) and long-term change horizon, 2060 (climate change)?
Sample Design

- Low-intensity, “extensive” national sampling effort
- Higher-intensity, “intensive” local sampling effort (driven by local management questions)
Web Hosting is expected this Fiscal Year and will include:

- Conceptual Models
- Management Questions
  - Methods & Results
- Conservation Elements
  - Summary & Results
- Attributes and Indicators Table
- Main Report
- Inserts for Conservation Elements and Change Agents
- Appendices
Rapid Ecoregional Assessments

BLM Lands

Year of Assessment Initiation
- 2010
- 2011
- 2012 Pre-Assessment

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THANK YOU
Oregon’s Willamette Basin and Statewide Regional Ecoregional Framework

Jimmy Kagan
Director, Institute for Natural Resources – Portland and Oregon Biodiversity Information Center
Willamette Basin
Regional Ecosystem Framework

*Integrating the diverse set of Conservation Assessments*
Willamette Basin Synthesis Project

A Collaborative Approach to Conservation Planning, Natural Resource Data Development, and to building a Regional Ecosystem Framework

Oregon Department of Fish and Wildlife
Oregon Biodiversity Information Center
Oregon Parks & Recreation Department
Oregon Biodiversity Project
Oregon Department of Environmental Quality

The Nature Conservancy
Willamette Partnership
Defenders of Wildlife
Clean Water Services
Metro
Features from 5 major Willamette conservation assessments were combined into a “Union Portfolio”

- Site boundaries were refined using 2005 imagery and current spatial data for rare species, soils, vegetation, wetlands, land management, land use and zoning.

- A few additional sites were added to incorporate good remnants of native habitats and species.

- Initial project was completed in May of 2009. Regular review and updates are critical to keep this plan relevant. The first of those reviews is was completed in 2011, leading to an update to be completed in 2012.
Complete a Statewide Wetland Mitigation and Restoration Priority Coverage

Wetland Priority

Conservation importance
- Distance to salmon habitat
- Designated critical habitat
- Wetland Special Area of Concern
- Distance to spring
- Habitat for, Proposed, Listed, Candidate or high ranked Species
- Important Migratory Bird Area

Ecosystem service values
- Distance to 303(d) stream
- Floodplain (100-yr)
- [Groundwater supporting]
- [TMDL Supporting]
- [Stormwater Supporting]

Wetland restoration, mitigation value
- Potential or Farmed Wetlands
- Distance to wetland restoration area
- Protected area
- Conservation priority

Existing wetland condition
- [Floristic Quality Index]
- Vegetation Condition
- Bisected by canal
- Farmed
- Impacted Hydrology
- Wetland size
- Wetland neighborhood
- Vernal pool condition

Landscape integrity
- Fragmentation
- Affected by roads
Upper Deschutes River Basin Priorities for Two Themes
Create statewide Section 7 review – Critical Habitat Maps; and statewide High Probability Distribution Maps for all Federally Listed Species

*Sidalcea nelsoniana* (Nelson’s checkermallow)

Random Forest model based on USFWS recovery rules, LiDAR DEM and updated data for a threatened species
the Oregon Conservation Strategy -
healthy habitats for wildlife and people
Columbia Plateau Ecoregion Example

Important Attributes
- Habitats: grasslands; sagebrush; large tract of riparian
- Species: sage sparrow (23% of habitat in ecoregion); grasshopper sparrow; burrowing owl; sagebrush lizard; WA ground squirrel
- Important Bird Area
Statewide Conservation Assessments

The Oregon Plan for Salmon and Watersheds

Oregon’s Wetlands Conservancy

Oregon Watershed Enhancement Board (OWEB)

Oregon’s Living Landscape

Willamette Valley—Puget Trough—Georgia Basin

Ecoregional Assessment
Integrate into a First Iteration Statewide Regional Ecosystem Framework
Contact Information:

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What is H-GAC?

- Metropolitan Planning Organization for 8-county area
- Occupies 9,020 square miles, larger than state of New Jersey (8,722 square miles)
- Forecasted population of more than 9 million by 2035
Purpose of Eco-Logical

- Decision support system for long-range regional transportation planning
- Inventory of high value environmental resources
- Data clearinghouse for organizations and the public
Project Process

- Committee
- Mapping
- Metrics

- GIS Integration
- Outreach
Ecotypes

• Tidal Wetlands
• Bottomland Forests
• Upland Forests
• Coastal Prairies
• Water Bodies
Mapping
Metrics

- Adjacency
- Size
- Shape
- Isolation
- Threatened & Endangered Species
- Scarcity
- Diversity of Habitat
- Quality
Intended uses

• Long-range transportation
• Identifying conservation priorities
• Scenario analysis
• Public awareness
Project limitations

- Scale
- Generalized ecotype classifications
- Metrics, data limitations
- Subjective quality rating
- Not appropriate for site-specific evaluation
Project Challenges

- Having the right representatives on your committee
- Determining appropriate scale of project
- Time, staff and technical resources
- Creating a workplan for the project
- Having flexible methodology
Questions?

www.h-gac.com/go/eco-logical

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Questions?
Transportation Liaison Community of Practice Website

www.environment.fhwa.dot.gov/liaisonCOP
Purpose:

– Increase understanding of the roles and benefits of transportation liaisons
– Provide greater access to and sharing of expertise, resources, and opportunities for innovation and professional development

Users:

– Liaisons and liaison managers
– Resource and regulatory agencies
  • Networking
  • Knowledge/resource exchange
  • Share events
– State DOTs
  • Find information about Liaison programs
  • Example MOUs
  • Contacts and connections

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Join the Community of Practice!
- Register on the CoP website if you are a liaison or liaison manager
- Tell others who may be interested
- Submit calendar events
- Submit resources to the resource library including sample agreements, work plan examples, and technical resources
- Participate in the discussion board – coming soon!

Questions? Contact Michael Lamprecht Michael.Lamprecht@dot.gov or 202-366-6454.
Upcoming Eco-Logical Webinar Topics

June 2012: Green Infrastructure: Eco-Logical Concepts in Infrastructure Planning

Future topics:
- Wetland Planning and Assessments: Applications for Transportation Siting and Mitigation
- Linking Transportation and Ecosystems in an Urban Environment: Stormwater Developments and Case Studies
- Technical Assistance to Connect Eco-Logical Knowledge with Transportation Plans and Projects
- Land Trusts as Mitigation Partnership Opportunities

Eco-Logical Webinar Series: