



Terrestrial Biodiversity Conservation and Landscape Restoration Planning

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Theory to Practice Workshop
Lubrecht Experimental Forest

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Presentation Outline

- Background
 - Regional
 - Forest
 - Landscape
- Selecting Species to Focus On
 - Viability Assessments
- Listed Species Conservation and Forest Restoration
 - Northern Spotted Owl
 - Canada Lynx
- Landscape Restoration and Species Conservation
 - An example

White-Headed Woodpecker



Some Background

- Regional Species Viability Assessment Process in Support of Forest Plan Revisions
- Viability Assessments for Forest Plan Revisions
- Forest Restoration Strategy and Focal Wildlife Species



The Coarse Filter

- Originally included as part of ICBMP
- Revised and refined by additional work from Hessburg et al. 1999, 2000, 2005
- Concept and approach using Future Range of Variability added in Gartner et al. 2008

Regional Species Viability Assessment Process

- The USFS Region 6 Process:
 - Step 1: Identify Species of Concern and Species of Interest
 - Step 2: Define source habitats
 - Step 3: Group species
 - Step 4: Fine scale habitat features and risk factors
 - Step 5: Select Focal Species
 - Step 6: Develop Assessment Models (BBNs)
 - Step 7: Conservation Strategies
 - Step 8: Monitoring and Adaptive Management
- Peer and Technical Reviews

Selecting Terrestrial Species

- Federally listed species (endangered, threatened, candidate, proposed)
- Species with a determination of “warranted but precluded” under ESA
- US Forest Service Sensitive Species
- NatureServe rankings of G1-G3 or T1-T3 or S1-S3
- State Threatened and Endangered Species
- Bird species on USFWS Birds of Conservation Concern National Priority List
- List of 209 species for Northeast Washington



Link species to habitat associations

- Johnson and O'Neil Habitat Relationships Database
- ICBEMP Source Habitats database
- Literature review
- Peer review



Group species based on habitat associations

- Cluster analysis based on source habitats
- Same approach as used by the ICBEMP Source Habitats assessment used as starting point
- Review and rework groups based on professional knowledge and literature to place species in final groups
- Results: 29 Groups
- Science Team reviewed

Identify Risk Factors

Forest Service activities that may change availability or the effectiveness of habitat and/or affect populations

Risk factors include:

- **Roads**
- **Mining**
- **Fire (wildfire, prescribed fire, fire suppression)**
- **Recreation**
- **Grazing**
- **Vegetation management**
- **Invasive species**

Focal Species – a key characteristic of a focal species is that its status and trend provide insights to the integrity of the larger ecological system to which it belongs. Focal species encompass habitats for other species, are sensitive to the changes likely to occur in the area, or otherwise serve as an indicator of ecological sustainability.

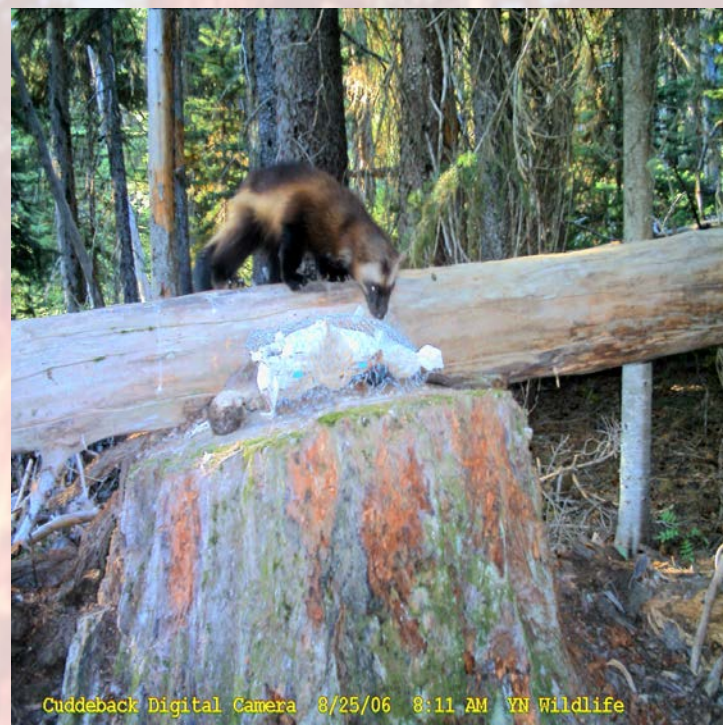
Criteria for Selection of Focal Species

Select one or more species per group based on:

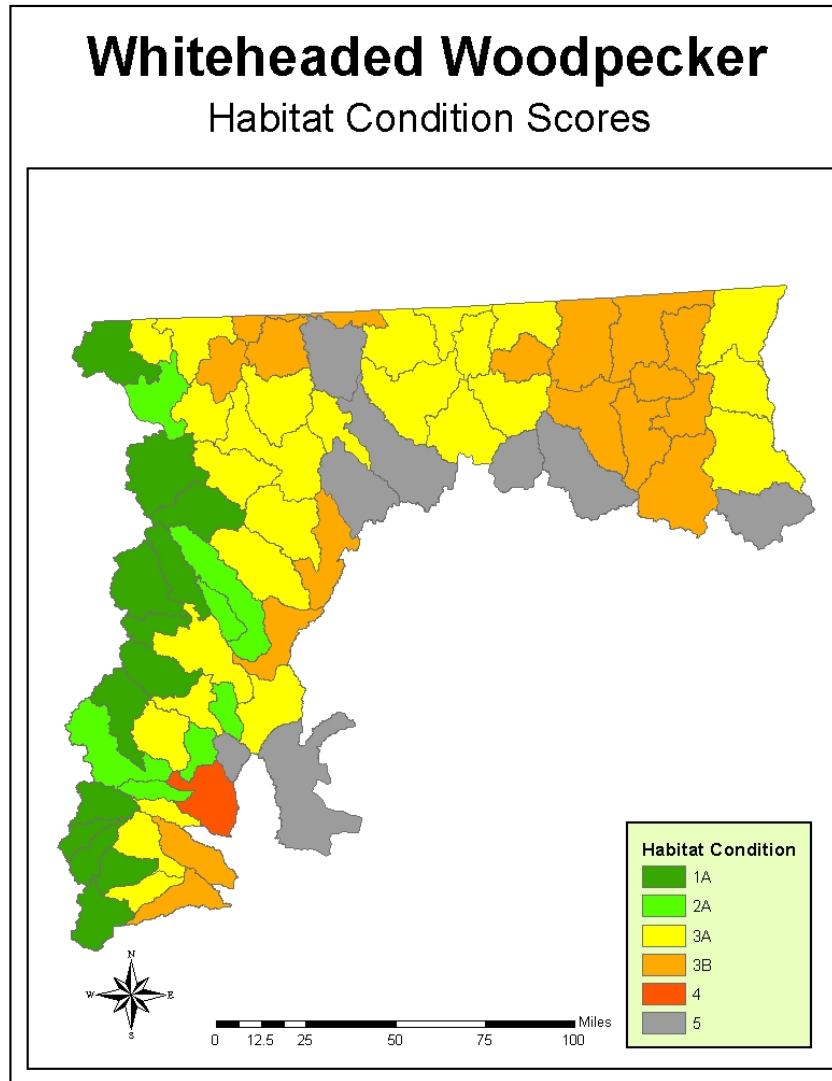
- Habitat associations that represent the group
- Populations and/or habitats can be most readily monitored
- Data/information availability
- Species with distribution across the planning area
- TES Species
- Species most sensitive to the risk factor(s)
- 33 Focal Species for Northeast Washington

Focal Species Viability Assessments

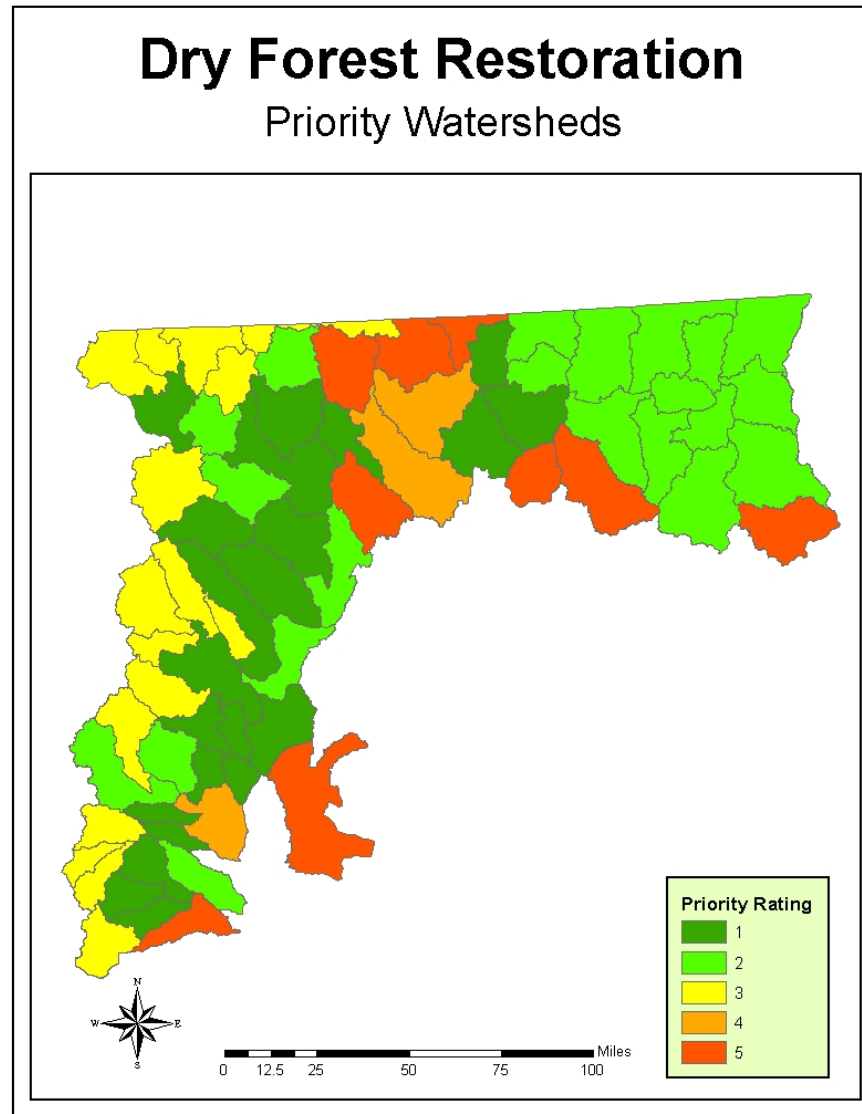
- **BBN Models**
 - Habitat departure
 - Risk factors
- **Watershed Index Model**
 - Capability to contribute to viability
- **Viability Outcome Model**
 - Cumulative watershed scores
- **Viability Outcomes**
 - Habitat departure
 - Risk factors
 - spatial arrangement of “good” watersheds



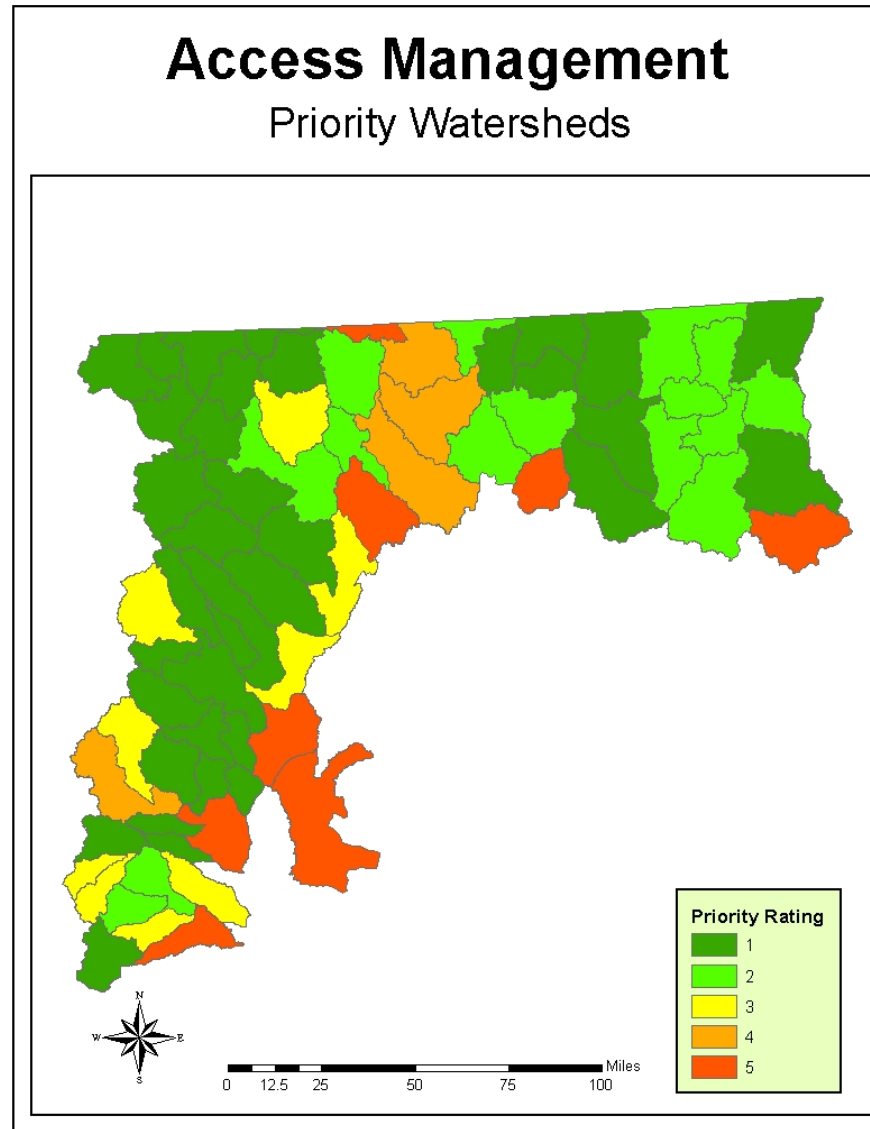
White-headed Woodpecker Habitat Conditions



Priority Watersheds for Dry Forest Restoration



Priority Watersheds for Access Management



Listed Species and Forest Restoration

- Northern Spotted Owl

- “The Service continues to recommend that active forest management and disturbance-based principles be applied throughout the range of the spotted owl with the goal of maintaining or restoring forest ecosystem structure, composition and processes so they are sustainable and resilient under current and future climate conditions in order to provide for long-term conservation of the species”. USFWS 2011.
- “Design and implement restoration treatments at the landscape level. Treatments need to be placed in context with the surrounding landscape to be most effective and to accommodate the inherent disturbance regime (OWNF 2010)”. USFWS 2011.

- Canada Lynx

- “Conduct a landscape evaluation to identify needs or opportunities for adaptation to climate change. Identify reference conditions relative to the landscape’s ecological setting and the range of future climate scenarios. For example, the range of variability could be derived from landscape reconstructions”. LCAS 2013

A photograph of a forest fire. Bright orange and yellow flames are visible in the lower half of the frame, consuming the forest floor. Several tall, thin tree trunks stand in the background, some partially obscured by the smoke and fire. The overall scene is hazy and smoky.

Forest Restoration Strategy

Landscape Evaluation

“landscape evaluations concerned with the restoration of ecosystems might be based on a set of ecological indicator measures against reference conditions for those same indicators” from Reynolds and Hessburg 2005

A photograph of a forest fire. Bright orange and yellow flames are visible, rising from the ground and spreading between tall, thin trees. The background is a hazy, light blue sky. The overall scene is dramatic and intense.

Terrestrial Landscape Evaluation

Wildlife Habitat

- Subset of Focal Species
 - Appropriate at watershed scale
 - Influenced by forest management
 - Range of habitats
- Focal Wildlife Species
 - Northern spotted owl -NWFP
 - Northern goshawk-EastScreen
 - White-headed woodpecker
 - Other focal species: American marten, pileated woodpecker
- Reference Conditions
 - Current amount and arrangement of habitats
 - HRV, FRV

Northern Goshawk



Wildlife Habitat

- The amount of white headed woodpecker habitat is at the low end of HRV and FRV is overly fragmented. Abundance of goshawk habitat is also at the low end of HRV and FRV.
- The amount of current and potential future northern spotted owl habitat are both within HRV and FRV, but are also both overly fragmented.

Wildlife measure	Current	HRV	FRV
Habitat (acres)			
white headed woodpecker	532	0 - 2,300	0 - 1,700
spotted owl - current	1,116	0 - 2,500	0 - 2,200
spotted owl - future	3,337	350 - 8,300	0 - 7,700

-Use the references conditions to inform habitat goals

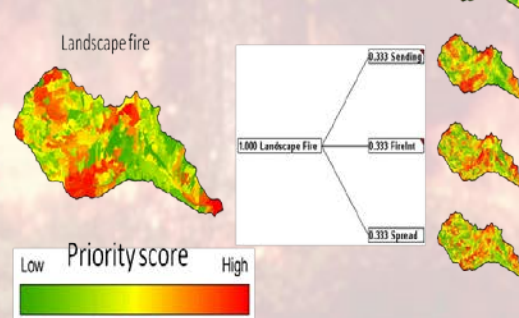
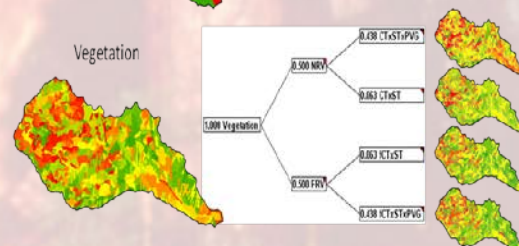
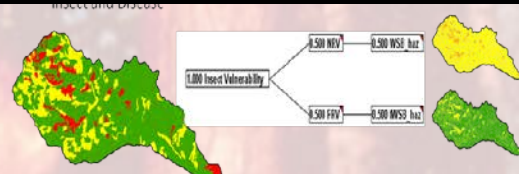
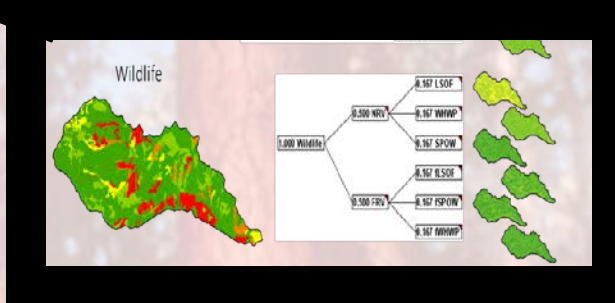
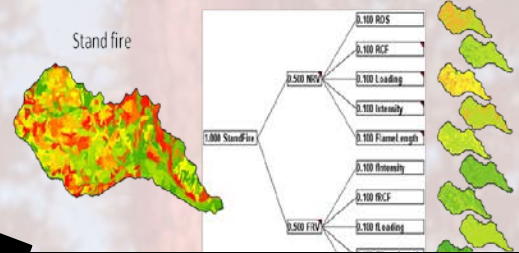
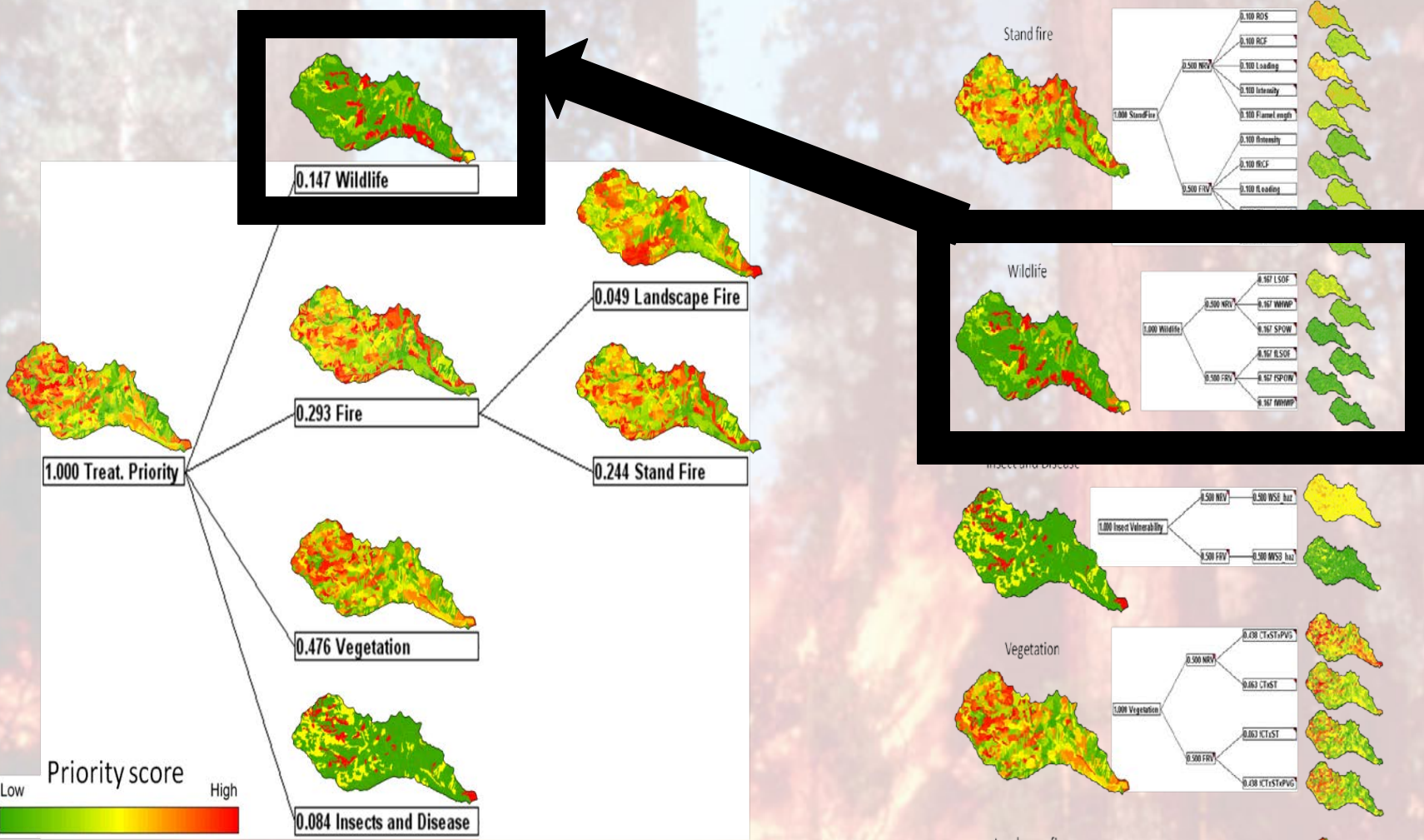
-Northern Spotted Owl:

-In Critical Habitat use upper end of the RV

-20-30% in dry/mesic forest

-40-60% in moist forests

-Identify replacement (future) habitat using RV



Integration – Wildlife Priorities

Landscape Prescription

- Restoration of Landscape and Watershed Resilience
- “Ideal” is to target the zone of overlap between HRV and FRV to set habitat goals
- Reference conditions help to establish the “boundaries of the system” in terms of the ability of the landscape to contribute to listed species habitats
- Used in combination with coarse-filter vegetation departure
- Disturbance “indicators” allows for a quantifiable way of assessing “risk” to habitats
- Assessing spatial pattern as a means of addressing habitat connectivity



Research Article

Maintaining Populations of Terrestrial Wildlife Through Land Management Planning: A Case Study

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Terrestrial Species Viability Assessments for the National Forests in Northeastern Washington

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Questions/Comments

