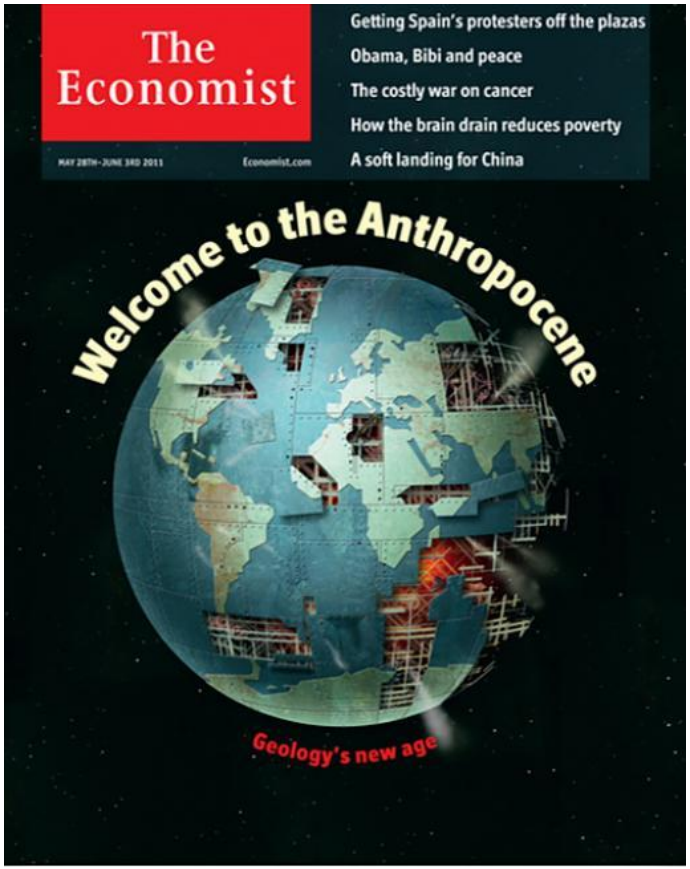
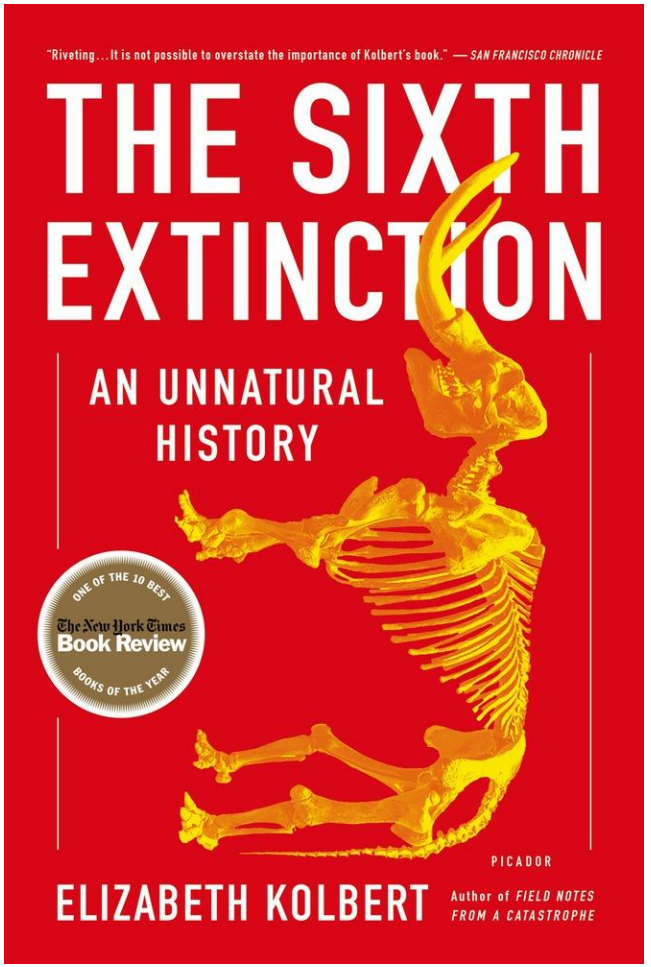
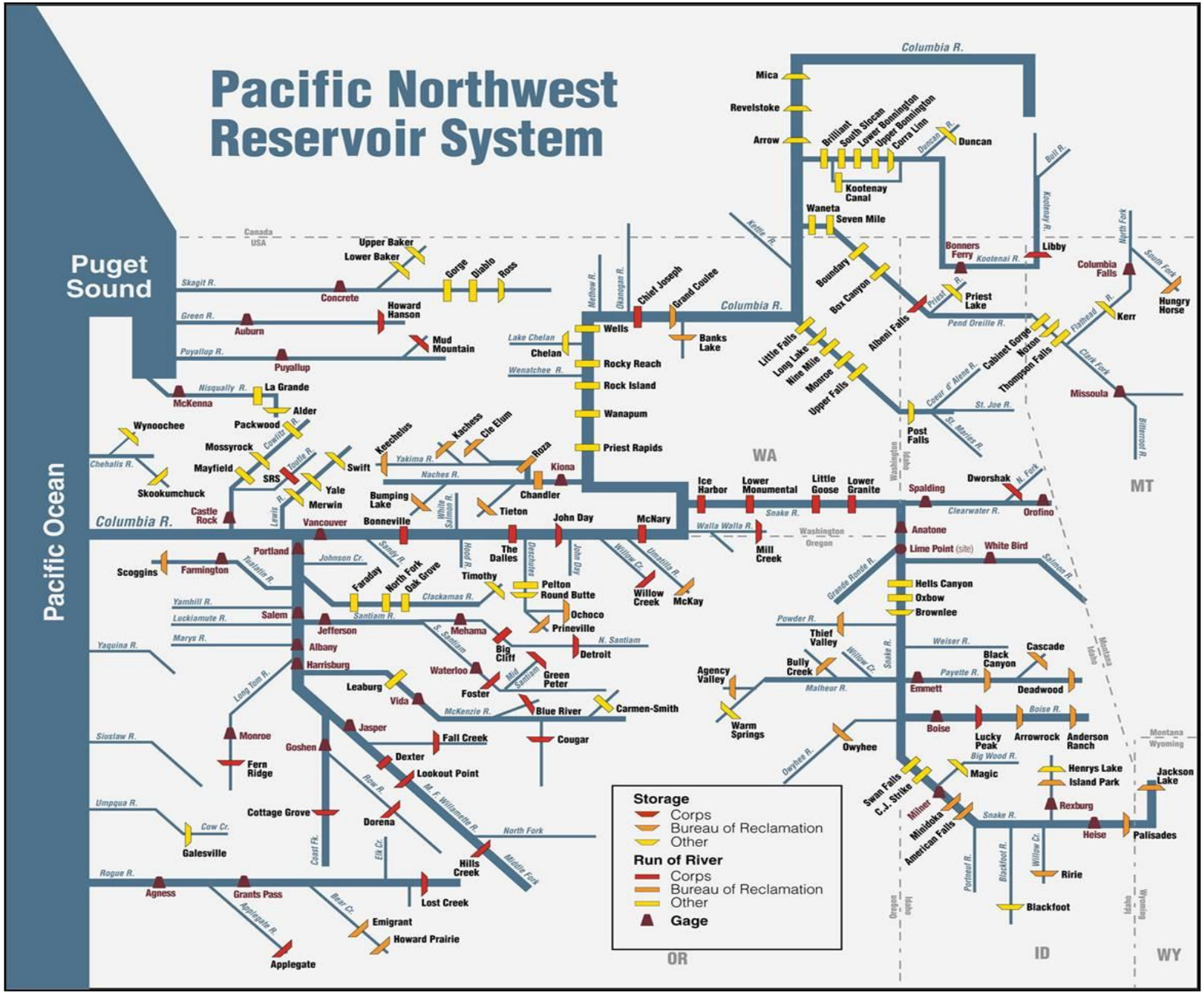
LANDSCAPE CONSERVATION DESIGN

Overview for NPLCC S-TEK

The Need for Landscape Conservation






Pacific Northwest
Reservoir System
Puget Sound
Pacific Ocean
Columbia R.
Canada
USA
Mica
Revelstoke
Arrow
Brilliant
South Slocan
Lower Bonnington
Upper Bonnington
Corra Linn
Duncan R.
Duncan
Kootenay Canal
Waneta
Seven Mile
Bull R.
Kootenay R.
Libby
Bonners Ferry
Kootenai R.
North Fork
South Fork
Columbia Falls
Hungry Horse
Kerr
Flathead R.
Clark Fork
Missoula
Bitterroot R.
Priest Lake
Priest R.
Albeni Falls
Pend Oreille R.
Cabinet Gorge
Noxon
Thompson Falls
Little Falls
Long Lake
Nine Mile
Monroe
Upper Falls
Boundary
Box Canyon
Kettle R.
Chief Joseph
Grand Coulee
Banks Lake
Methow R.
Okanogan R.
Wells
Lake Chelan
Chelan
Wenatchee R.
Rocky Reach
Rock Island
Wanapum
Priest Rapids
Upper Baker
Lower Baker
Gorge
Diablo
Ross
Concrete
Skagit R.
Howard Hanson
Green R.
Auburn
Mud Mountain
Puyallup R.
Puyallup
Nisqually R.
La Grande
McKenna
Alder
Packwood
Wynoochee
Chehalis R.
Skookumchuck
Mossyrock
Cowlitz R.
Mayfield
Tilton R.
SRS
Swift
Yale
Merwin
Lewis R.
Castle Rock
Columbia R.
Vancouver
Keechelus
Kachess
Cle Elum
Yakima R.
Roza
Naches R.
Kiona
Chandler
Bumping Lake
White Salmon R.
Tieton
Bonneville
John Day
McNary
Ice Harbor
Lower Monumental
Little Goose
Lower Granite
Snake R.
Walla Walla R.
Mill Creek
Washington
Oregon
WA
Spalding
Dworshak
N. Fork
Clearwater R.
Orofino
MT
Washington
Idaho
Anatone
Lime Point (site)
White Bird
Salmon R.
Grande Ronde R.
Hells Canyon
Oxbow
Brownlee
Powder R.
Thief Valley
Weiser R.
Willow Cr.
Snake R.
Bully Creek
Agency Valley
Malheur R.
Warm Springs
Owyhee
Owyhee R.
Cascade
Black Canyon
Payette R.
Emmett
Deadwood
Boise R.
Boise
Lucky Peak
Arrowrock
Anderson Ranch
Big Wood R.
Magic
Swan Falls
C.J. Strike
Milner
Minidoka
American Falls
Snake R.
Henrys Lake
Island Park
Rexburg
Heise
Palisades
Jackson Lake
Montana
Wyoming
Montana
Idaho
Portneuf R.
Blackfoot R.
Willow Cr.
Ririe
Blackfoot
Oregon
Idaho
Idaho
Wyoming
ID
WY
Portland
Johnson Cr.
Scoggins
Farmington
Tualatin R.
Sandy R.
Faraday
North Fork
Oak Grove
Clackamas R.
Hood R.
Timothy
The Dalles
Deschutes
John Day
Willow Cr.
Umatilla R.
McKay
Pelton
Round Butte
Ochoco
Prineville
Yamhill R.
Lockiamute R.
Salem
Santiam R.
Jefferson
Marys R.
Albany
Yaquina R.
Harrisburg
S. Santiam
Mehama
Big Cliff
N. Santiam
Detroit
Waterloo
Mid Santiam
Foster
Green Peter
Leaburg
Vida
Long Tom R.
McKenzie R.
Blue River
Carmen-Smith
Jasper
Fall Creek
Cougar
Siuslaw R.
Monroe
Goshen
Dexter
Lookout Point
Fern Ridge
Row R.
M.F. Willamette R.
Umpqua R.
Cottage Grove
Dorena
Cow Cr.
Galesville
Coast Fk.
Elk Cr.
North Fork
Middle Fork
Hills Creek
Rogue R.
Agness
Grants Pass
Lost Creek
Bear Cr.
Applegate R.
Emigrant
Howard Prairie
Applegate
Storage
Corps
Bureau of Reclamation
Other
Run of River
Corps
Bureau of Reclamation
Other
Gage
OR

Landscape Conservation Design

- A term for collaborative landscape planning.
- Follows evolution of the concept.

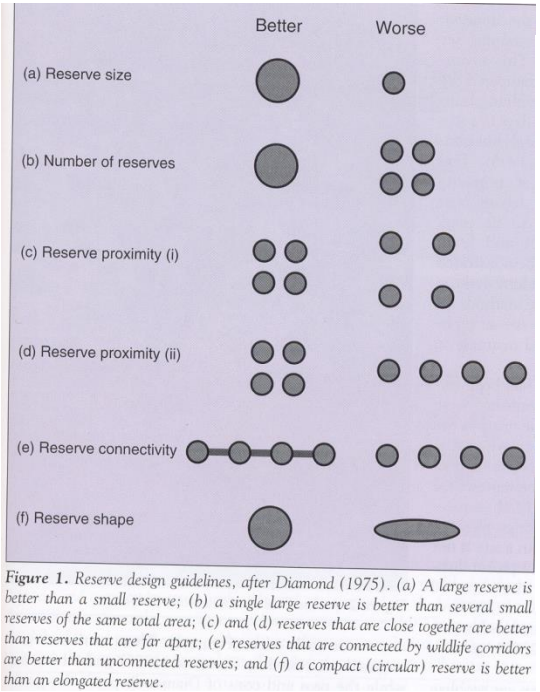
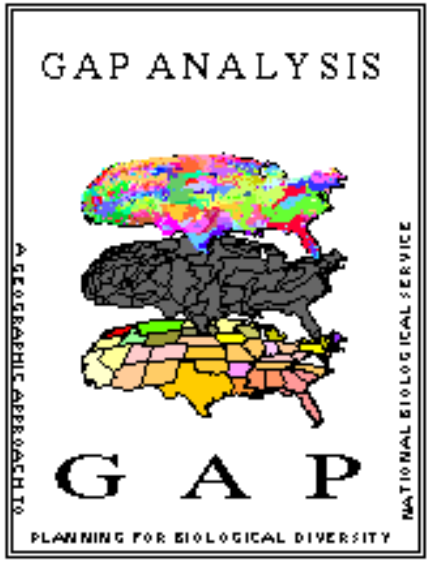
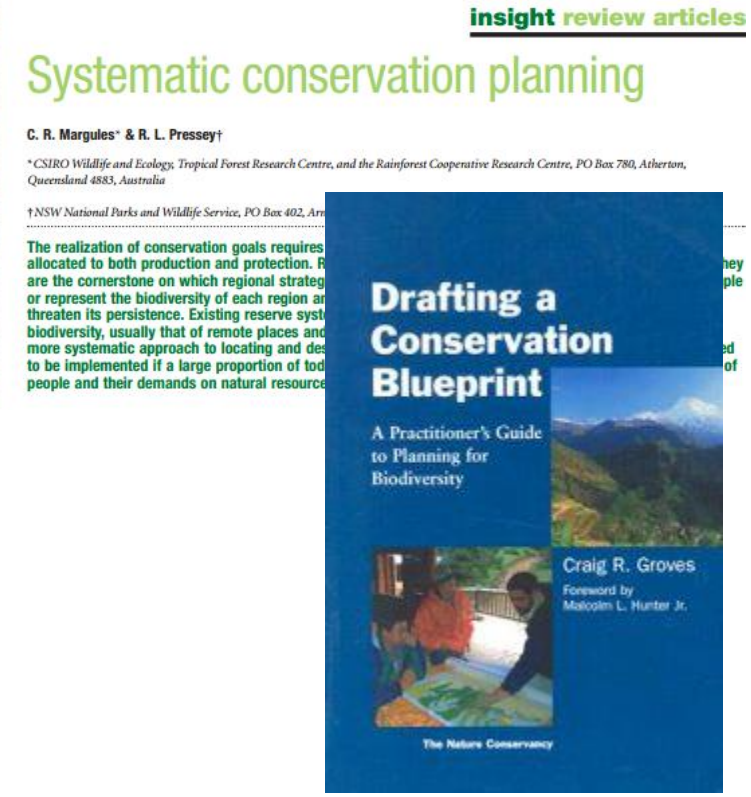
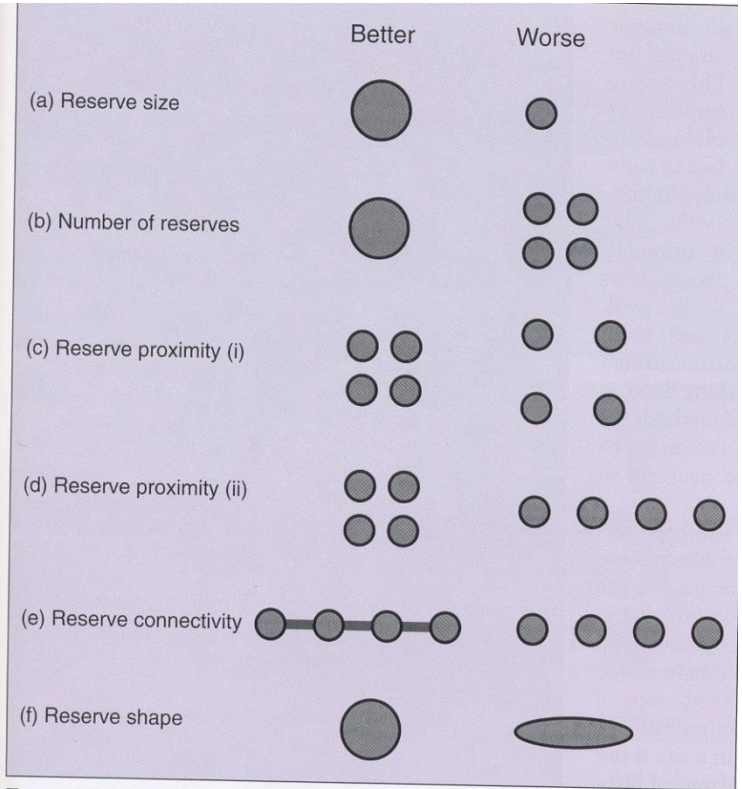


Figure 1. Reserve design guidelines, after Diamond (1975). (a) A large reserve is better than a small reserve; (b) a single large reserve is better than several small reserves of the same total area; (c) and (d) reserves that are close together are better than reserves that are far apart; (e) reserves that are connected by wildlife corridors are better than unconnected reserves; and (f) a compact (circular) reserve is better than an elongated reserve.





Evolution



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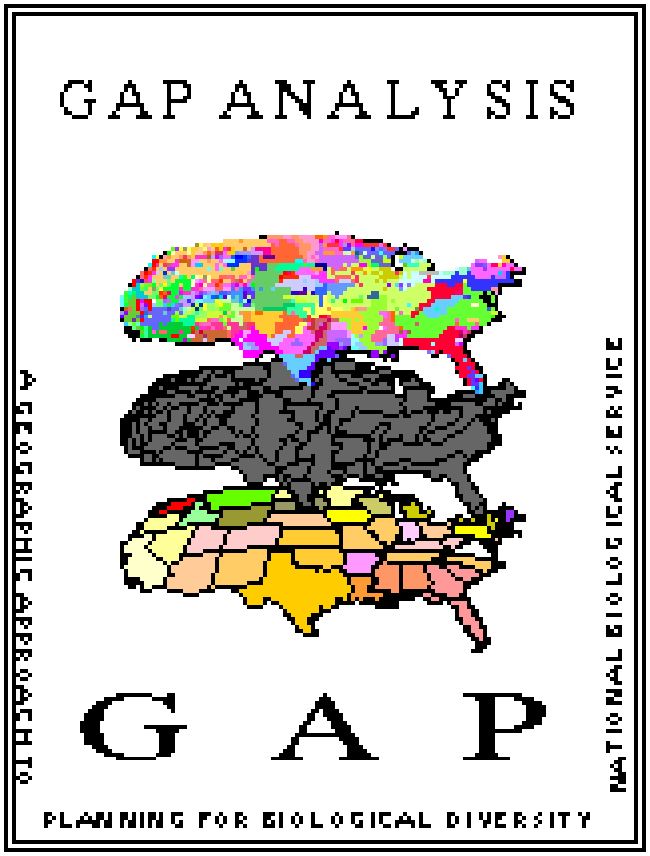
- Reserve Design
- Jared Diamond et al, 1975
- Focused on species, smaller areas.
- Articulates the need for design based upon ecological principles.

Evolution

- 1980s-90s: GAP Analysis.
- Larger scales, national program.
- Recognizes the role of GIS and data in conservation planning.



Evolution

insight review articles

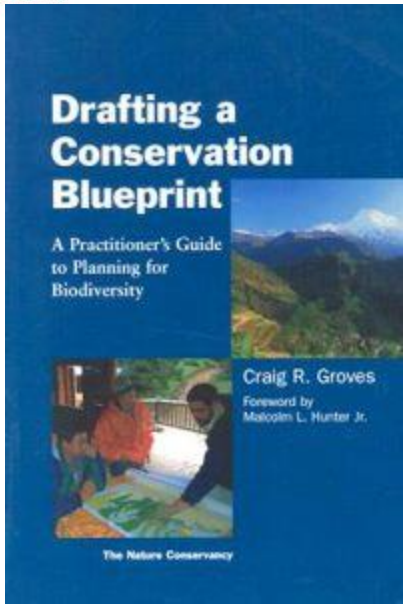
Systematic conservation planning

C. R. Margules* & R. L. Pressey†

*CSIRO Wildlife and Ecology, Tropical Forest Research Centre, and the Rainforest Cooperative Research Centre, PO Box 780, Atherton, Queensland 4883, Australia

†NSW National Parks and Wildlife Service, PO Box 402, Armidale, New South Wales 2350, Australia

The realization of conservation goals requires strategies for managing whole landscapes including areas allocated to both production and protection. Reserves alone are not adequate for nature conservation but they are the cornerstone on which regional strategies are built. Reserves have two main roles. They should sample or represent the biodiversity of each region and they should separate this biodiversity from processes that threaten its persistence. Existing reserve systems throughout the world contain a biased sample of biodiversity, usually that of remote places and other areas that are unsuitable for commercial activities. A more systematic approach to locating and designing reserves has been evolving and this approach will need to be implemented if a large proportion of today's biodiversity is to exist in a future of increasing numbers of people and their demands on natural resources.



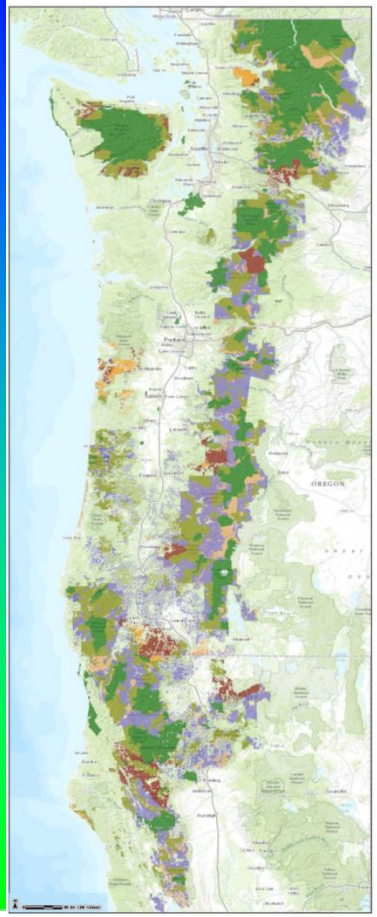
- Margules and Pressey, 2000 in Nature.
- Significant focus of research, 2000-2010
- Identifies an adaptive process and key principles.

Evolution

ECOSYSTEM MANAGEMENT: A PARADIGM SHIFT

FROM	TO
Individual species	Ecosystems
Small spatial scale	Multiple scales
Short-term perspective	Long-term perspective
Humans: independent of ecosystems	Humans: integral part of ecosystems
Management divorced from research	Adaptive management
Managing commodities	Sustaining production potential for goods and services

NOTE: Some of the substantive changes between traditional resource management and ecosystem management.



Shortcomings

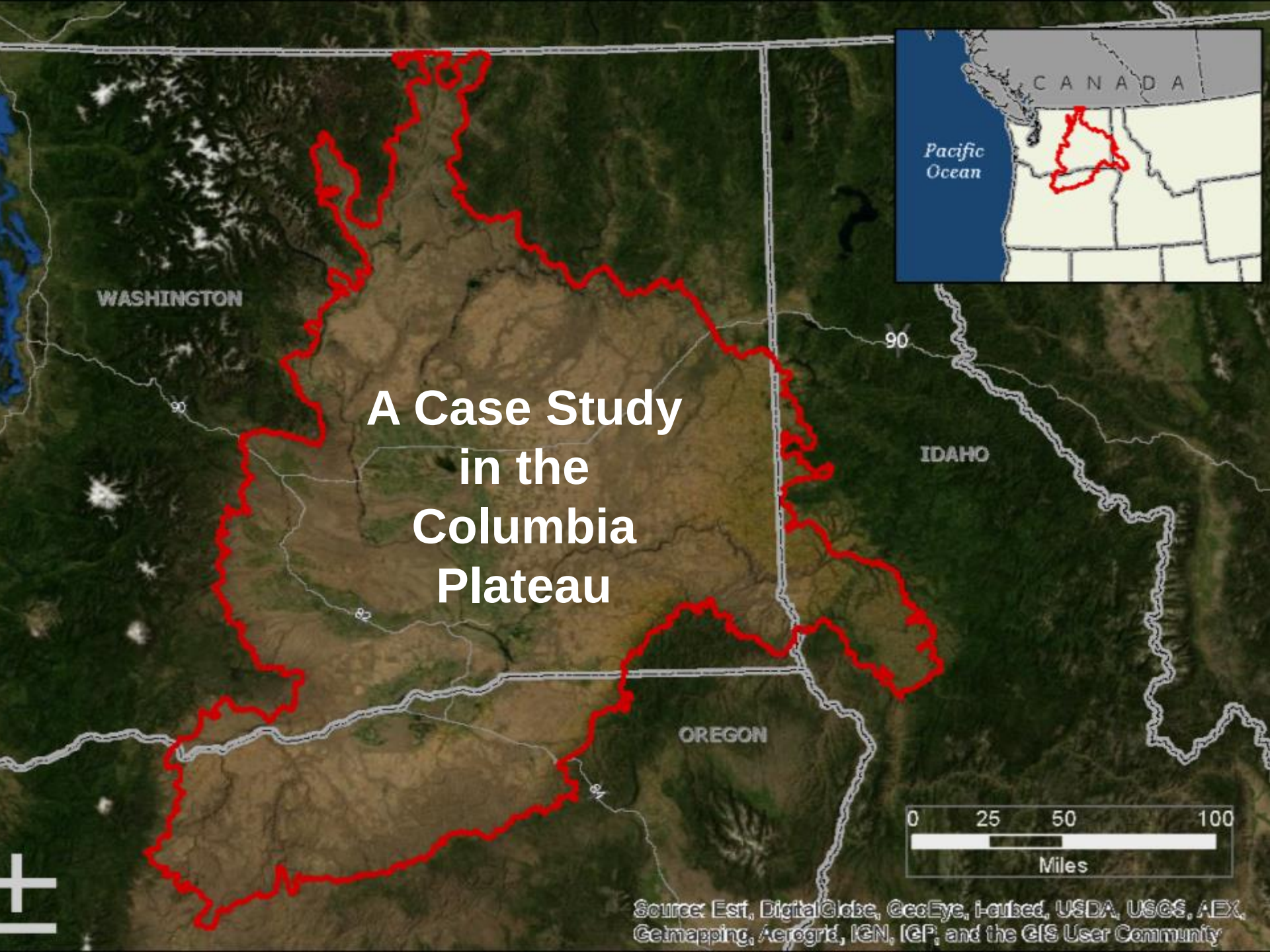
- Assumptions:
  - People will actually implement plans.
  - Nature will be stable.
  - Data is available.
  - Reserves are enough.

Landscape Conservation Design

- **Solutions**:
  - Need for convening entities (LCCs).
  - Explicitly address climate change.
  - Collaborative assessment and prioritization.
    - Co-production of knowledge
  - Move beyond “reserves”.
    - Ecosystem Services

Landscape Conservation Design Characteristics

- **Collaborative / Partner-Driven**
  - **Cross-jurisdictional, Multi-sector**
- **Built from Shared Goals**
  - **Holistic / System Level Process**
- **Landscape-scale assessment of Conservation Features**
  - **Assess Current and Future Conditions**
- **Desired Future Condition**
- **Strategies**
  - **Iterative / Adaptive Process**


A Case Study
in the
Columbia
Plateau
WASHINGTON
IDAHO
OREGON
CANADA
Pacific
Ocean
90
82
84
0
25
50
100
Miles
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX,
Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Great Northern
LANDSCAPE CONSERVATION COOPERATIVE

WASHINGTON STATE DEPARTMENT OF
Natural Resources

The Nature Conservancy
Protecting nature. Preserving life.™

Washington Department of FISH and WILDLIFE

Arid Lands Initiative

Audubon

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

Arid Lands Initiative Goal

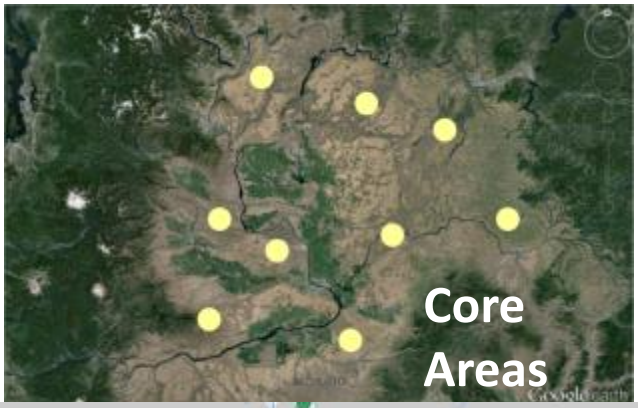
To develop and cooperatively implement a coordinated strategy for the conservation of Washington's arid lands, including shrub steppe, Palouse grasslands and those freshwater systems contained within the arid lands landscape.

This first phase was carried out through a collaborative process to:

- ✓ *develop shared priority strategies for conservation*
- ✓ *agree upon spatial priorities – where to do what*
- ✓ *agree on who is best placed to implement which strategy where across the landscape.*

Arid Lands Initiative

Shared Priority Areas – where actions should be focused first



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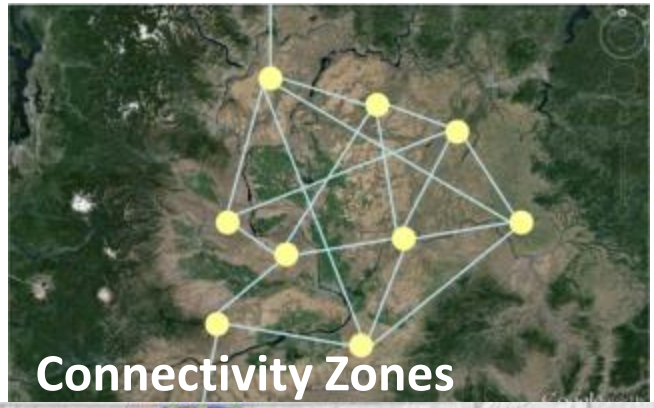
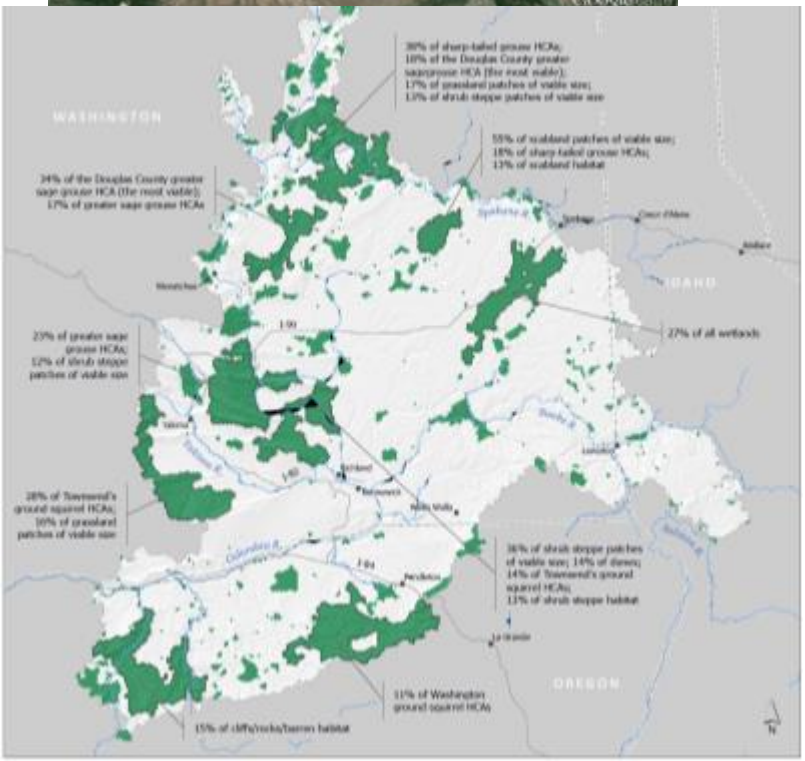
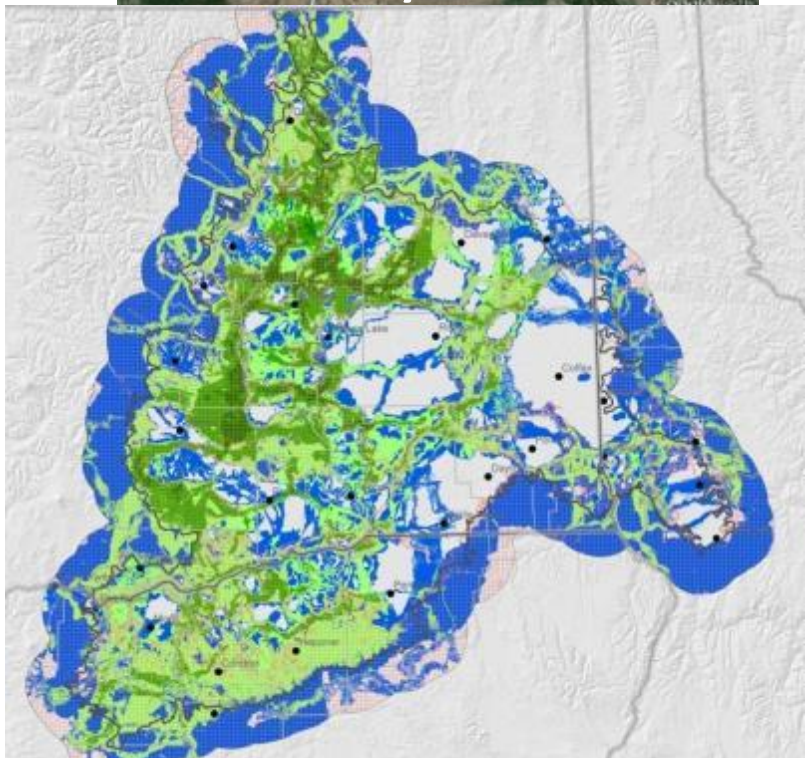
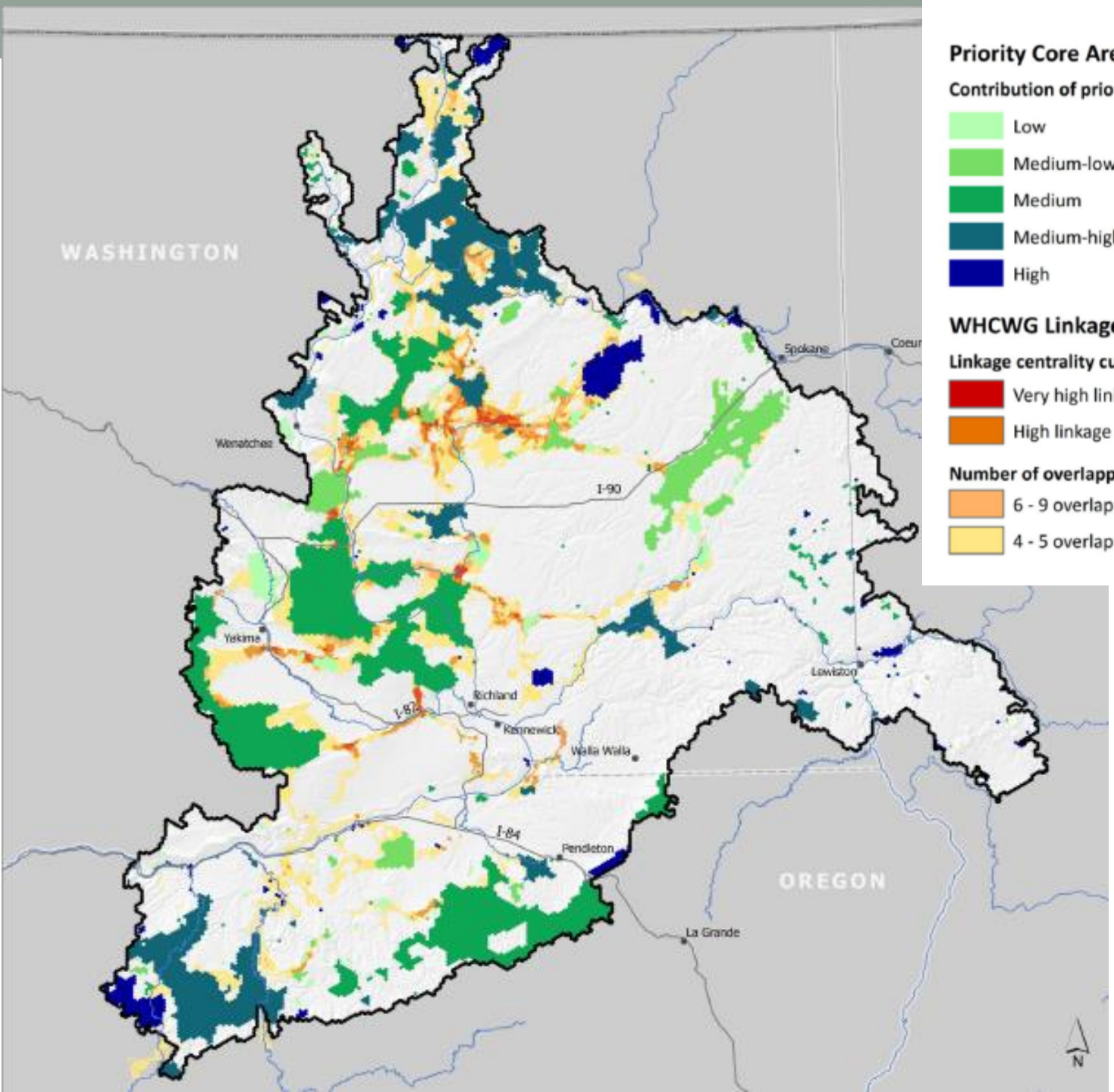








Priority Core Areas

Contribution of priority area to under-represented targets

- Low
- Medium-low
- Medium
- Medium-high
- High

WHCWG Linkages

Linkage centrality cumulative rating

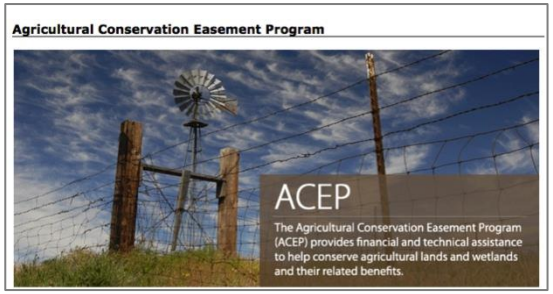
- Very high linkage centrality
- High linkage centrality

Number of overlapping WHCWG focal species networks

- 6 - 9 overlapping focal species networks
- 4 - 5 overlapping focal species networks

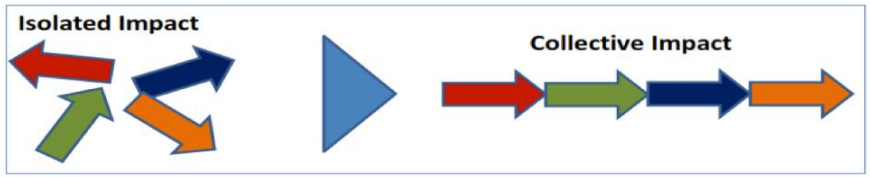
NRCS outreach out to private landowners under the Sage Grouse Initiative

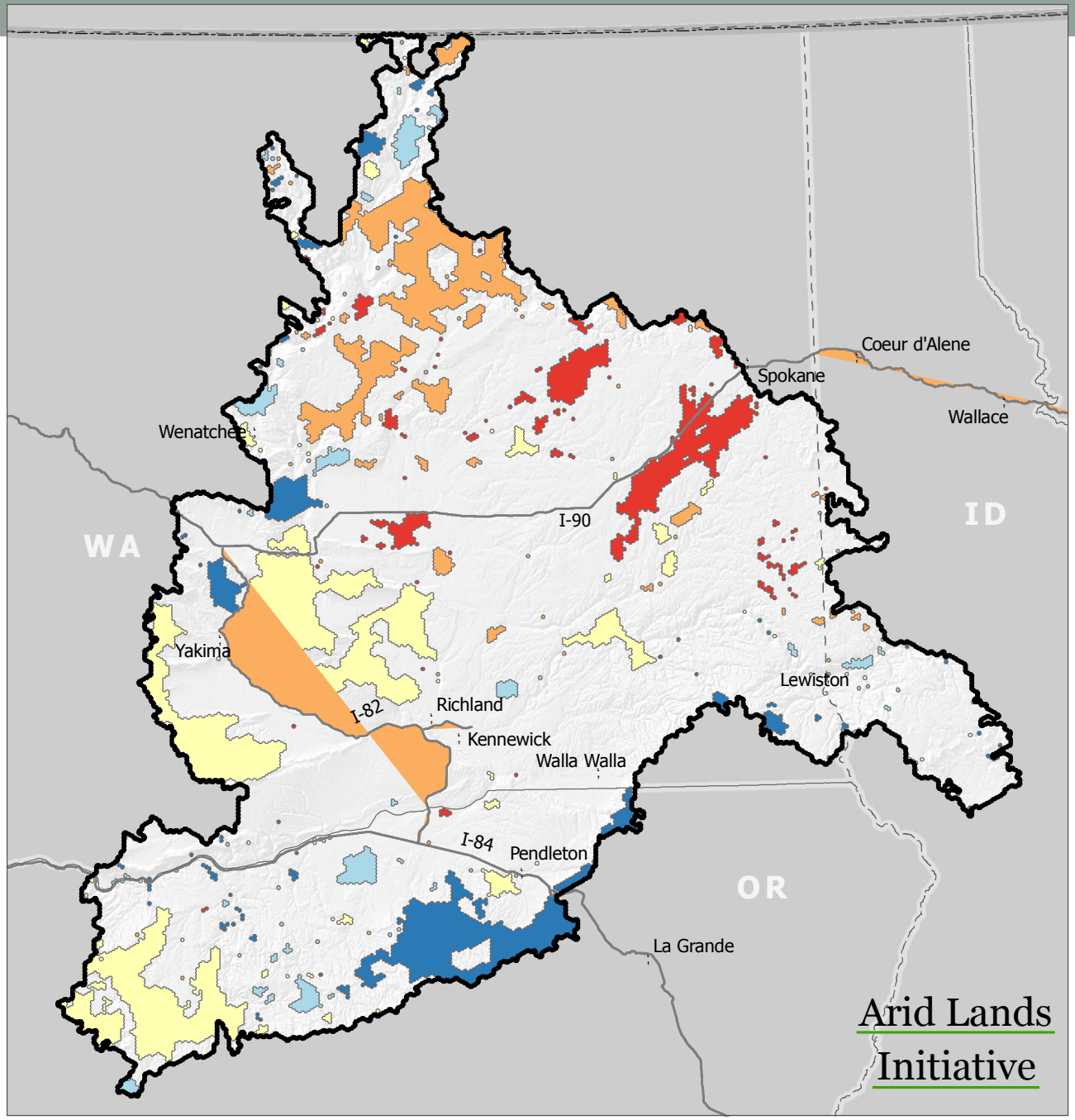
NRCS, USFWS, and other federal and state partners delineate Grasslands of Special Significance.



Develop a Candidate Conservation Agreement with Assurances (CCAA) for management of greater sage-grouse habitat on state Wildlife Areas.

USFWS: restoration projects on private lands funded under the Partners for Fish





Relative Overall Climate Change Vulnerability

Using a fuzzy logic model, several variables representing exposure, sensitivity, and adaptive capacity to climate change were rolled up into an overall index of relative vulnerability to climate change for the ALI's priority core areas.

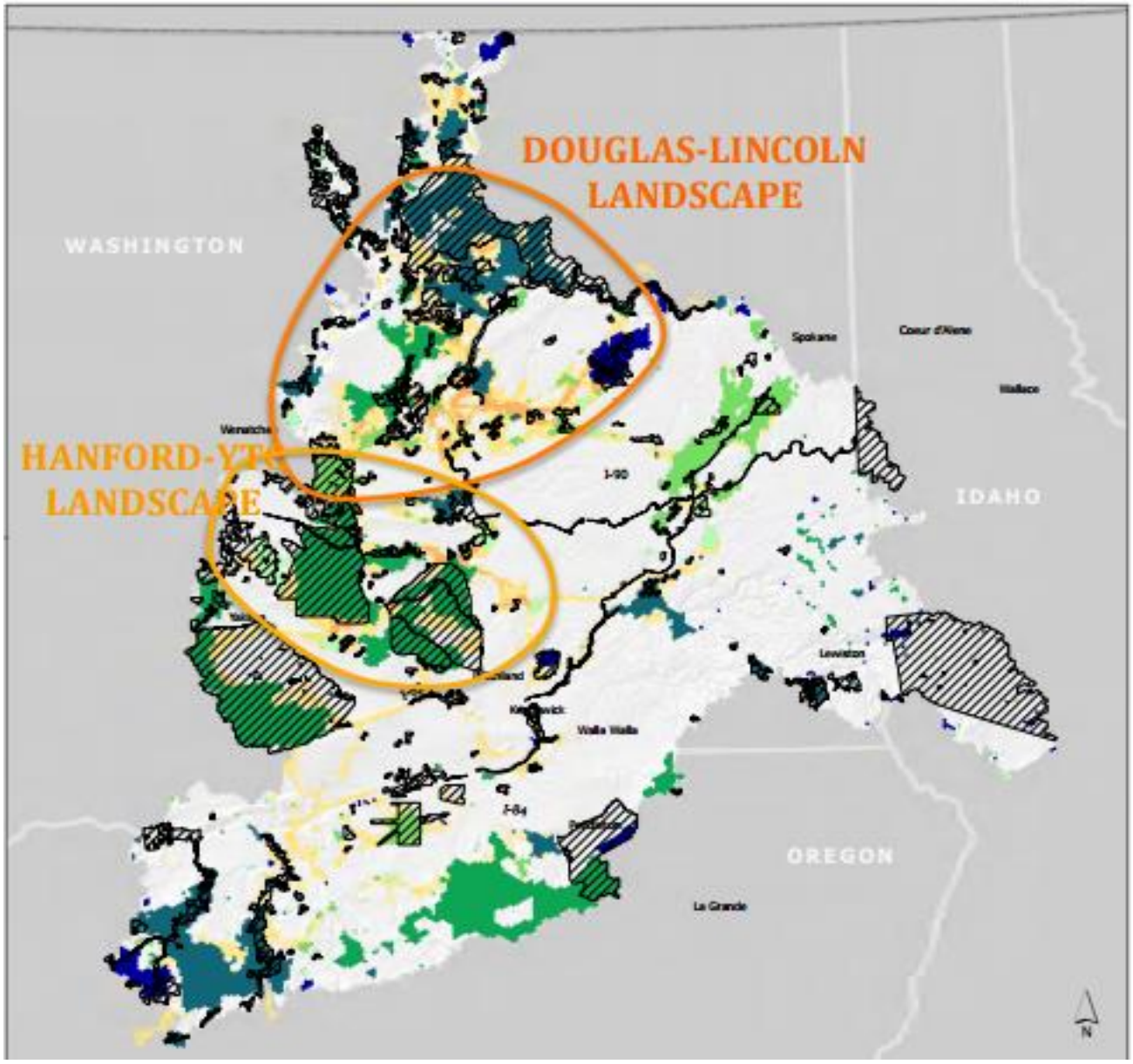
Relative Vulnerability

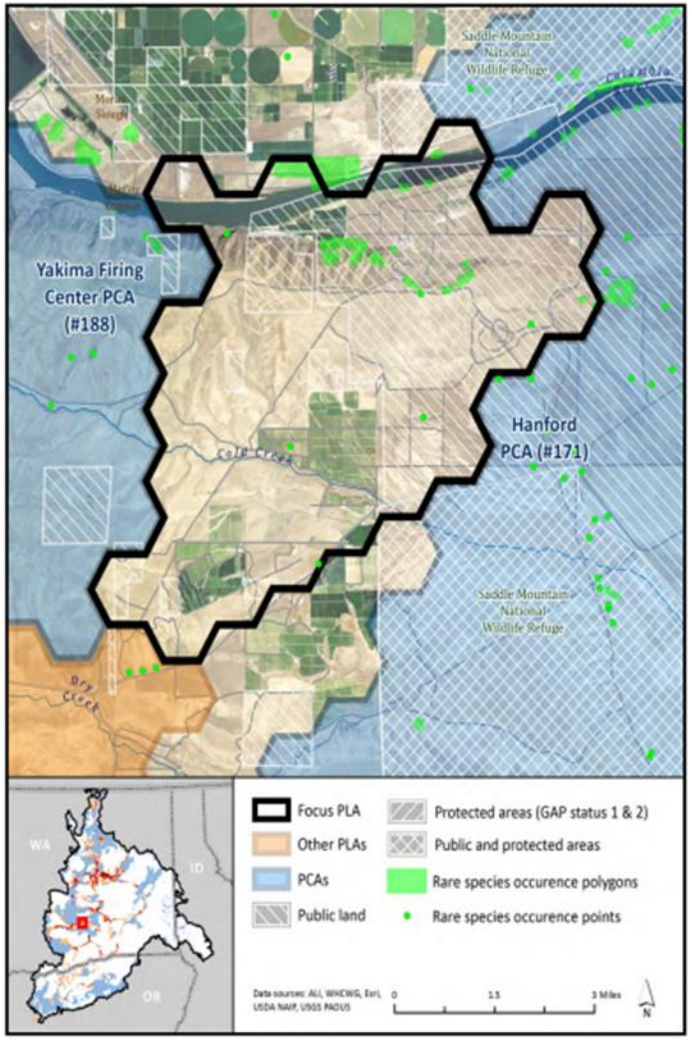
- Low
- Medium-low
- Medium
- Medium-high
- High

Data Sources: ALI, Esri, Natural Earth

0 20 40 60 80

Miles


DOUGLAS-LINCOLN
LANDSCAPE
HANFORD-YTK
LANDSCAPE
WASHINGTON
IDAHO
OREGON
Spokane
Coeur d'Alene
Wallace
Lewiston
Walla Walla
La Grande
I-90
I-84
N



Juniper Springs PLA (#50), Yakima Folds Ecoregion

Connectedness

H	Average Focal Species Count
N P	Cumulative Linkage Centrality
L	Species Count in Barriers
L	Species Count in Pinch-Points
N P	Greater Sage-Grouse network
N P	Sharp-Tailed Grouse network
H	Townsend's Ground Squirrel network
N P	Washington Ground Squirrel network
M H	General permeability to movement

Contribution to ALI targets

M H	Shrub steppe & dry grassland
H	Inland dunes
H	Cliffs, caves, and talus
M L	Depressional wetlands
L	Transitional woodlands
L	Greater Sage-Grouse HCAs
L	Sharp-Tailed Grouse HCAs
H	Townsend's Ground Squirrel HCAs
L	Washington Ground Squirrel HCAs
M H	Under-protected targets index

Current threats

L	Invasive annual grasses
H	Road density

Fire risk

M L	Vegetation departure
M H	Probability of burning
M L	Future fire frequency

Future non-climatic threats

M	Development pressure
H	Wind power potential
M H	Agricultural conversion pressure

Legend

Ranks based on relative values of PLAs, broken into quintiles

VALUES		THREATS
L	Low (bottom 20%)	L
M L	Medium-low	M L
M	Medium	M
M H	Medium-high	M H
H	High	H
N P	No data, not present, or N/A	N P

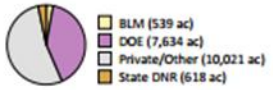
See www.tinyurl.com/ALI-scorecards for full report.

Climate Change Vulnerability

M Overall vulnerability

- **M** Exposure
  - L *Temperature climate velocity*
  - H *Multivariate climate velocity*
- **H** Sensitivity
  - N P *Sage-grouse contraction*
  - N P *Sharp-tailed grouse contraction*
  - M L *Big sagebrush contraction*
  - M H *Climate sensitive targets index*
  - M H *Vegetation instability*
- **M H** Adaptive capacity
  - M *Climate change resilience*
  - M L *Percent permanently protected*
  - M L *Landscape condition model*
  - M L *Climate connectivity (temperature only)*
  - L *Climate connectivity (temp. & landscape integrity)*

Ownership



The 5 Conditions of Collective Impact

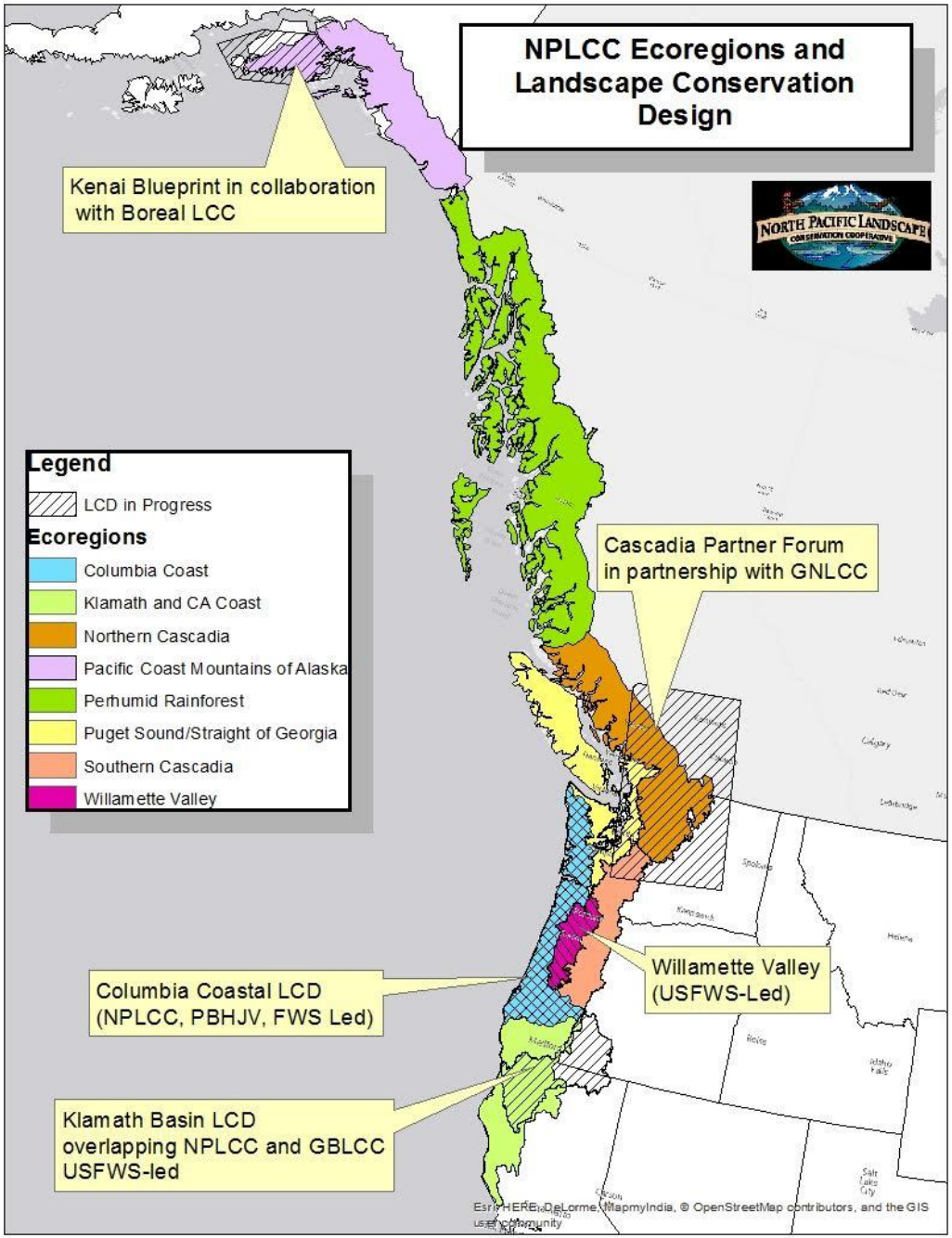
1. **Common Agenda**
   - **Common understanding** of the problem
   - **Shared vision** for change

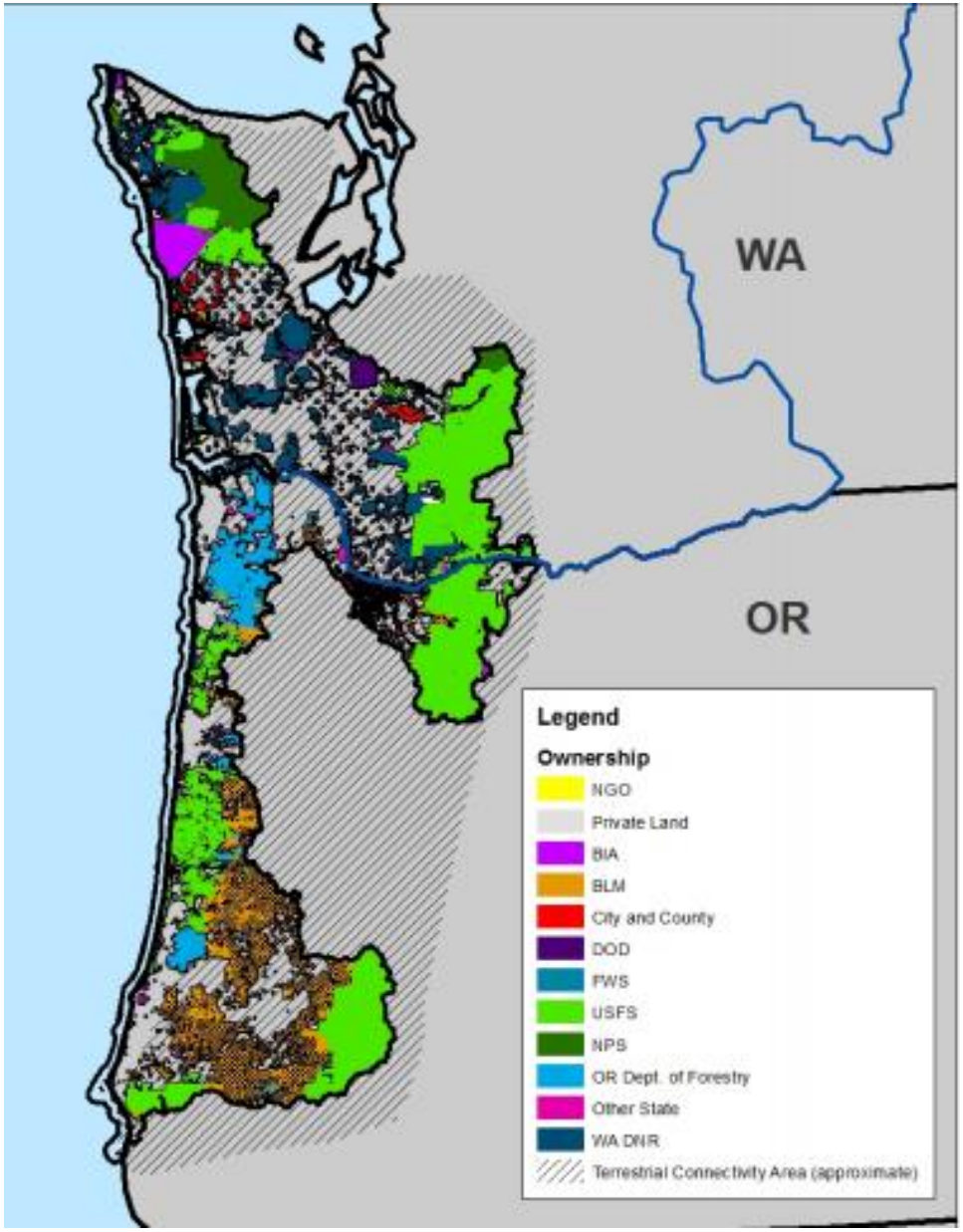
2. **Shared Measurement**
   - **Collecting data** and **measuring results**
   - Focus on **performance management**
   - **Shared accountability**

3. **Mutually Reinforcing Activities**
   - **Differentiated approaches**
   - **Coordination** through joint plan of action

4. **Continuous Communication**
   - **Consistent** and **open communication**
   - Focus on **building trust**

5. **Backbone Support**
   - Separate organization(s) with **staff**
   - Resources and skills to **convene** and **coordinate** participating organizations


NPLCC Ecoregions and Landscape Conservation Design
Kenai Blueprint in collaboration with Boreal LCC
NORTH PACIFIC LANDSCAPE CONSERVATION COOPERATIVE
Legend
LCD in Progress
Ecoregions
Columbia Coast
Klamath and CA Coast
Northern Cascadia
Pacific Coast Mountains of Alaska
Perhumid Rainforest
Puget Sound/Straight of Georgia
Southern Cascadia
Willamette Valley
Cascadia Partner Forum in partnership with GNLCC
Willamette Valley (USFWS-Led)
Columbia Coastal LCD (NPLCC, PBHJV, FWS Led)
Klamath Basin LCD overlapping NPLCC and GBLCC USFWS-led
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



http://columbiacoastblueprint.org/