

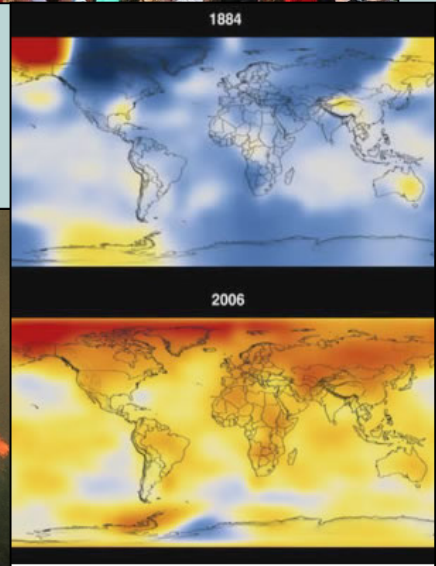
# Landscape Conservation Design for the Crown of the Continent



Crown LCD Kick Off  
21 January 2020

Year: 2042

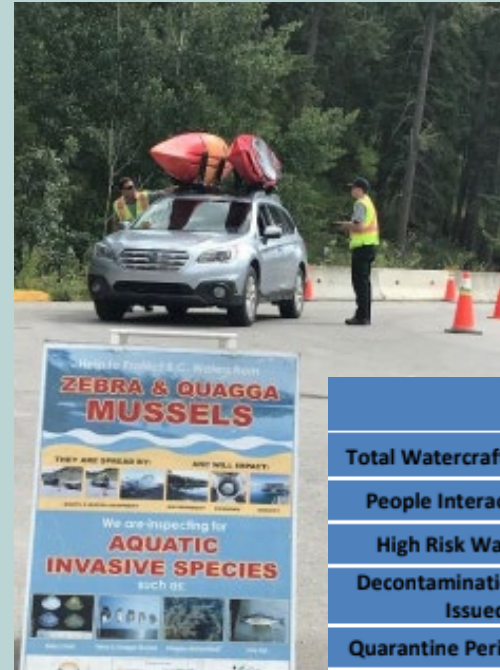
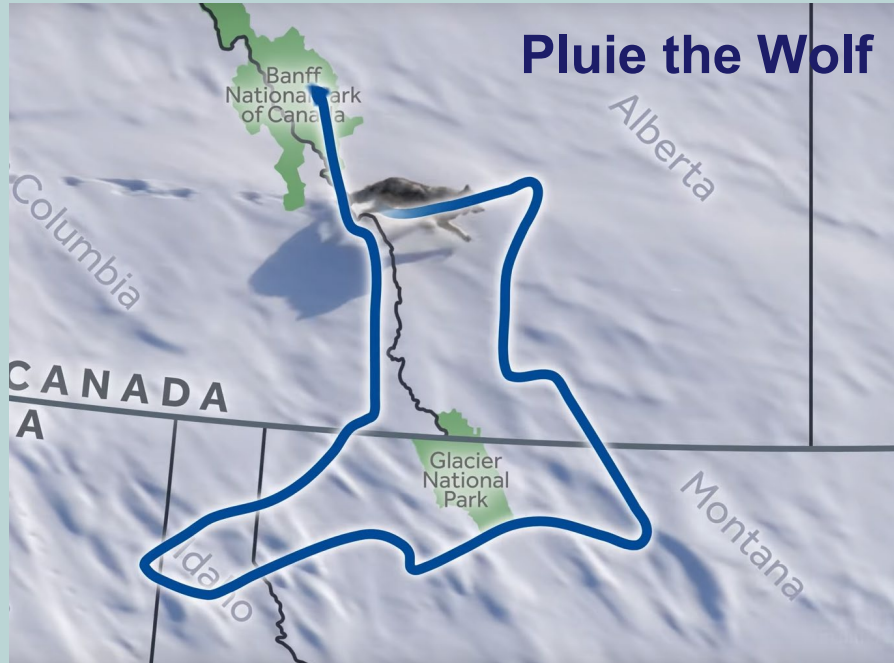
– Global Population ~9 Billion People –  
habitat fragmentation, contamination, pollution, invasive species,  
disease, threats to water quality and quantity...



“The conservation challenges of the 21<sup>st</sup> Century represent a force of change more far-reaching and consequential than any previously encountered.”

# The Land is Telling Us ...

Whether we always knew it or are just now recognizing, modern challenges are emerging at broad spatial and temporal scales



	July 30th 2018	July 31 2019
<b>Total Watercraft Inspected</b>	25,000	31,000
<b>People Interacted with</b>	49,000	57,000
<b>High Risk Watercraft</b>	1,130	810
<b>Decontamination Orders Issued</b>	202	52
<b>Quarantine Periods Issued</b>	180	52
<b>Mussel fouled watercraft</b>	18	14




# No shortage of planning

**USDA**  
United States Department of Agriculture

**Flathead National Forest Land Management Plan**  
Flathead, Lake, Lewis and Clark, Lincoln, Missoula, and Powell Counties, Montana





**Climate Change Strategic Plan**  
September 2013  
Flathead Reservation



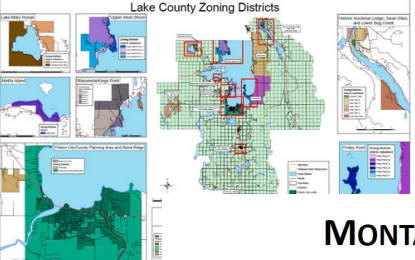
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**U.S. Fish & Wildlife Service**

**Draft Comprehensive Conservation Plan and Environmental Impact Statement**  
*National Bison Refuge*



**Waterton Lakes National Park of Canada**



2010

**MONTANA'S STATE WILDLIFE ACTION PLAN**

MONTANA FISH, WILDLIFE & PARKS  
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2014 - 2024  
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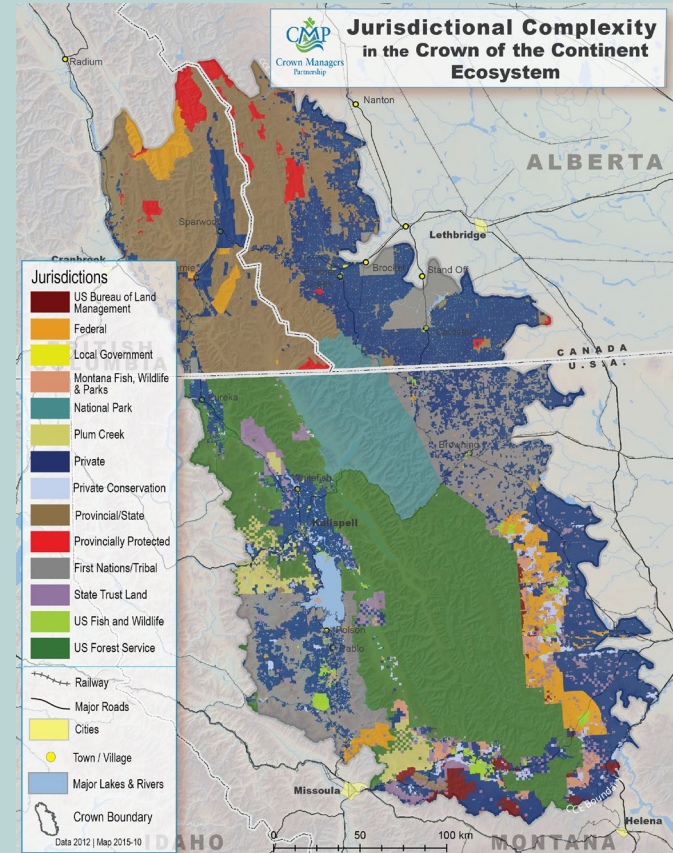
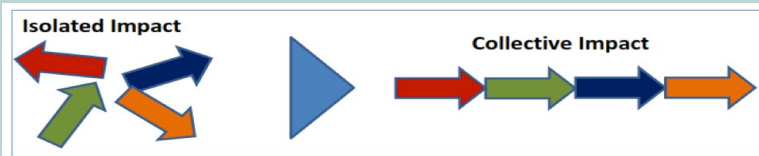


**General Management Plan**

**GLACIER NATIONAL PARK**  
A Portion of Waterton-Glacier International Peace Park  
Flathead and Glacier Counties, Montana

# Challenges of the Social Variety

- Jurisdictional Complexity
- Poor access to data /information/knowledge —**science**—
- Exclusionary Decision Making
- Inequity
- NIMBY
- Reliance on / appeal to litigation
- Politics
- Conflict over access to resources

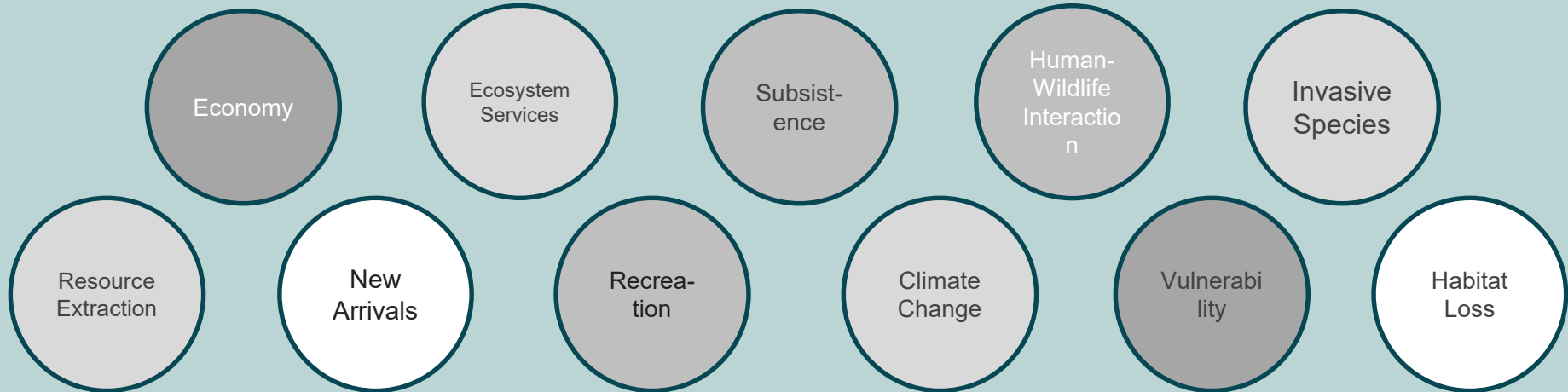


# ... Can we stitch it all together?

- Conservation challenges extend beyond traditional land management units
- Successfully addressing challenges will require large landscape, synthetic approaches that:
  - Are **respectful and inclusive** of landowner and agency visions, goals and mandates
  - **Effectively address ecological and social priorities** including ecological features (e.g., at-risk species), system functions (e.g., connectivity) and human uses (e.g., food production)

## Social

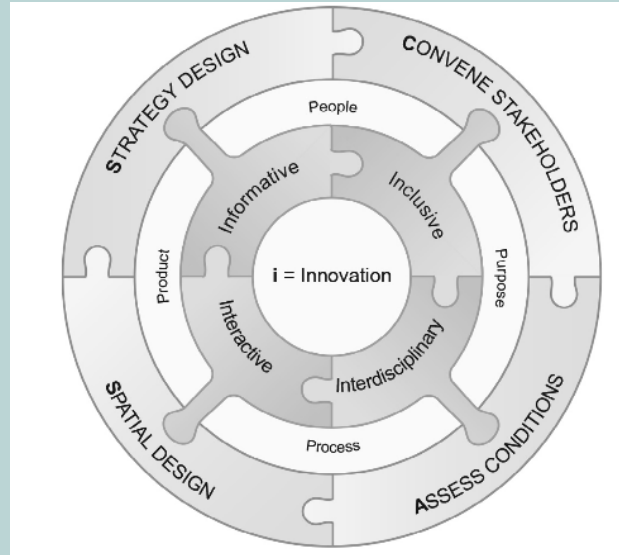
## Ecological



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## Socio- Ecological Solutions



# Landscape Conservation Design Defined:

a **partner -driven** approach to achieve a **sustainable, resilient socio - ecological landscape** . It is an *iterative*, **collaborative** , and **holistic** process resulting in **strategic and spatial products** that provide information, analytical tools, maps, and strategies to **achieve landscape goals collectively** held among partners.

LCD provides a landscape context to support agencies and jurisdictions to successfully address mandates by proactively identifying and addressing:

- **threats** that may impede successful plan implementation and
- **opportunities** that may not be recognized by singular approaches

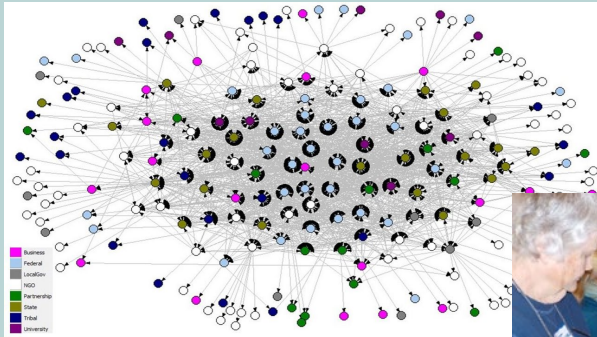


**Non Regulatory ... Bottom Up ... Voluntary**

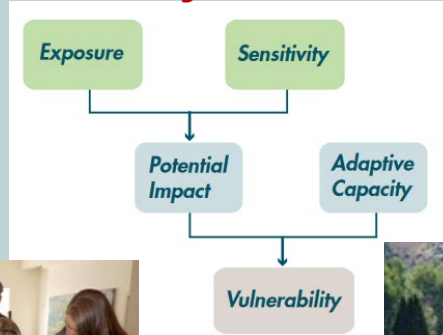


# People and Science...

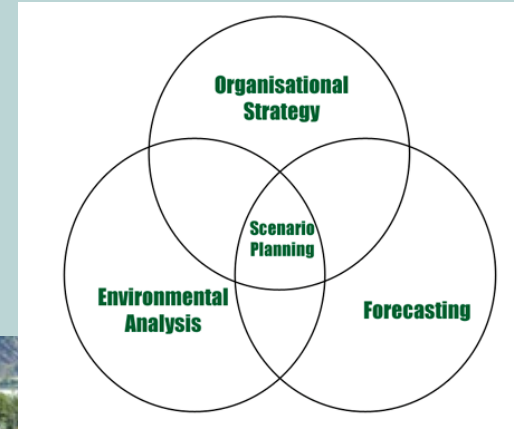
## Social Networks



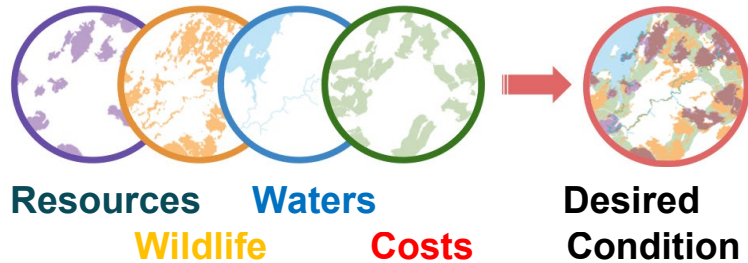
## Vulnerability Assessment



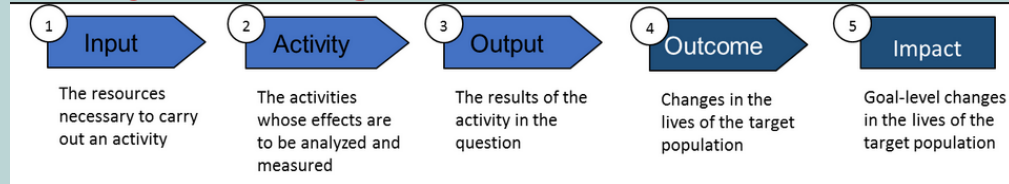
## Scenario Planning



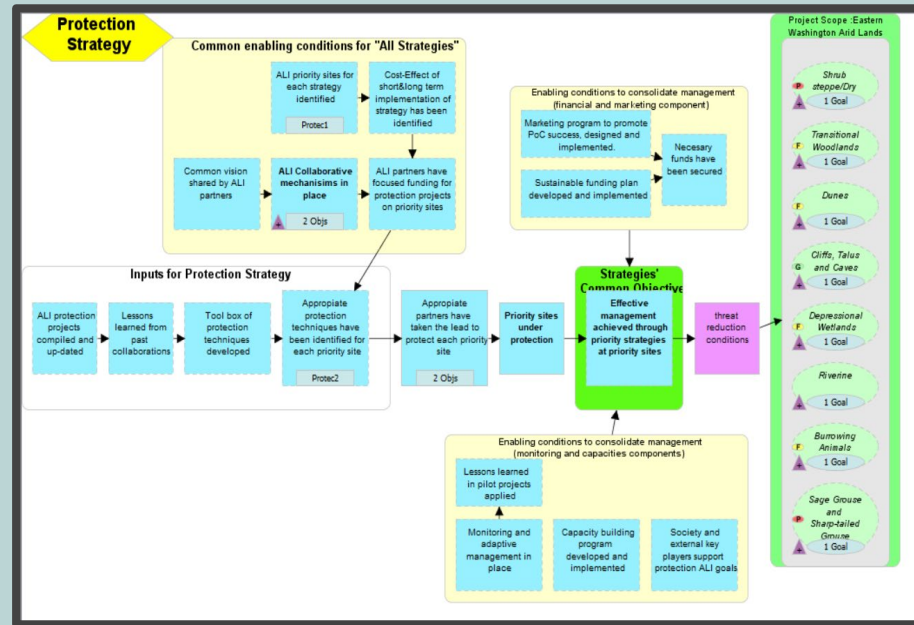
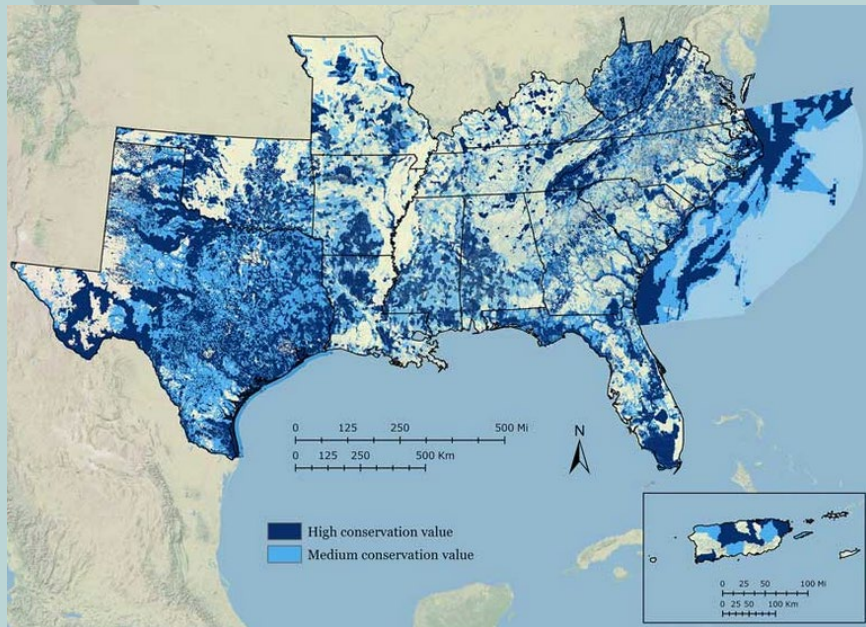
## Optimization Models



## Theory of Change



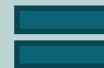
# ... Working together to design the future



Spatial Design



Strategic Design



**Landscape Conservation Design**

# LCD: A Concept Proven

NW Landscape Conservation Forum  
June 23-24, 2020 – Portland, OR



## Completed, in Implementation

1. North Atlantic: Nature's Network
2. South Atlantic Conservation Adaptation Strategy
3. Appalachian NatureScape
4. Columbia Plateau LCD / Arid Land Initiative
5. Green River Basin LCD

## In Progress:

6. Cascade to Coast Blueprint
7. Cascadia Climate Adaptation Strategy

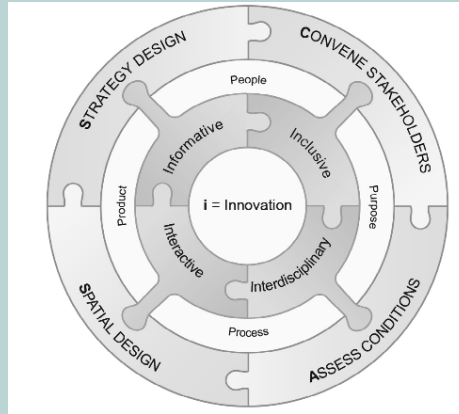
## Getting Started:

8. Crown of the Continent
9. High Divide Collaborative (coming in 2020)



# LCD: An Adaptive Framework

1. Convene Stakeholders and Frame the Design
2. Assess Current and Desired Future Conditions
3. Spatial Design
4. Strategy Design



[Nine Principles of Landscape Conservation Design](#)

[Recommended Practices for Landscape Conservation Design](#)

Landscape and Urban Planning 176 (2018) 64–74

Contents lists available at ScienceDirect

**Landscape and Urban Planning**

journal homepage: [www.elsevier.com/locate/landurbplan](http://www.elsevier.com/locate/landurbplan)

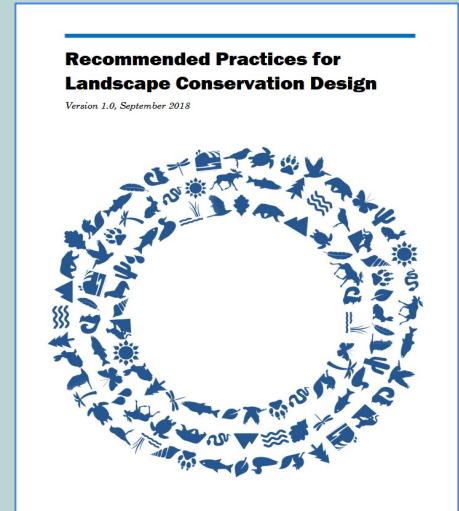
Perspective Essay

**The iCASS Platform: Nine principles for landscape conservation design**

Robert M. Campellone<sup>a,\*</sup>, Kristina M. Chouinard<sup>b</sup>, Nicholas A. Fisichelli<sup>c,d</sup>, John A. Gallo<sup>e</sup>, Joseph R. Lujan<sup>f</sup>, Ronald J. McCormick<sup>g</sup>, Thomas A. Miewald<sup>h</sup>, Brent A. Murry<sup>i</sup>, D. John Pierce<sup>j</sup>, Daniel R. Shively<sup>k</sup>

<sup>a</sup> National Wildlife Refuge System, U.S. Fish and Wildlife Service, Mail Stop: NWRS, 5275 Leesburg Pike, Falls Church, VA 22041-3803, USA  
<sup>b</sup> Migratory Bird Program/National Wildlife Refuge System, U.S. Fish and Wildlife Service, Jackson, TN 38305, USA  
<sup>c</sup> Climate Change Response Program, National Park Service, Fort Collins, CO 80524, USA  
<sup>d</sup> Schenck Institute of Acadia National Park, Winter Harbor, ME 04693, USA  
<sup>e</sup> Conservation Biology Institute, Corvallis, OR 97331, USA  
<sup>f</sup> National Wildlife Refuge System, U.S. Fish and Wildlife Service, Albuquerque, NM 87103, USA  
<sup>g</sup> Environmental Quality and Protection, Bureau of Land Management, Washington, DC 20036, USA  
<sup>h</sup> North Pacific Landscape Conservation Cooperative/National Wildlife Refuge System, U.S. Fish and Wildlife Service, Portland, OR 97232, USA  
<sup>i</sup> Caribbean Landscape Conservation Cooperative, U.S. Fish and Wildlife Service, San Juan, PR 00913, USA  
<sup>j</sup> Wildlife Program, Washington Department of Fish and Wildlife, Olympia, WA 98501, USA  
<sup>k</sup> Watershed, Fish, Wildlife, Air & Rare Plants Program, U.S. Forest Service, Washington, DC 20250, USA

[Check for updates](#)





# Convene Stakeholders and

# Frame Design

## Convene Stakeholders

- **Crown Managers Partnership**
  - Convening Body



## Frame the Design

- **Where to Design?**
  - Geography relevant to Stakeholders
- **What to focus on?**
  - Shared Vision
  - Landscape Features of shared importance
    - Species, Ecosystem components, Resources, Economies, Processes



# Frame the Design

## Challenge 1: Where?



Crown Managers Partnership AOI



Watersheds



Municipalities

# Frame the Design

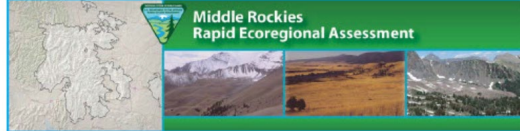
## Challenge 2: What to Focus On?

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United States Department of Agriculture

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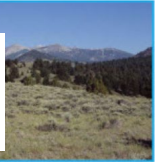
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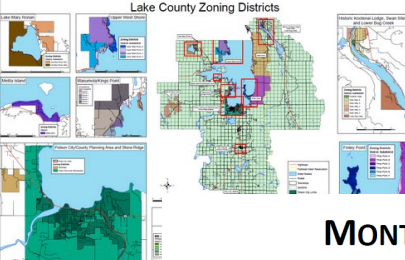
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Flathead and Glacier Counties, Montana

# Frame the Design

## Challenge 2: What to Focus On?

### Select Landscape Features:

- **Ecology**
  - Species
  - Habitat Types
  - Processes (i.e., connectivity)
- **Social**
  - Economies
  - Recreation
- **Cultural**
  - Traditional Uses
  - Historic Value



### Criteria to Consider:

- **Representative**
- **Comprehensive**
- **Extent / Range**
- **Impact, Importance**
- **Context** (do we know enough?)
- **Contentiousness** (low)
- **Data Available**

### Proposed Features:

Coarse Filter	Meso Filter	Fine Filter
Conifer Forest <sup>1</sup>	Mesic-Wet <sup>2</sup> Xeric-Mesic <sup>1</sup> Five Needle Pines <sup>2</sup>	Whitebark Pine <sup>2,3</sup> Limber Pine <sup>2</sup>
Alpine <sup>1</sup>	Grass & Shrub <sup>2</sup> Sparse or Barren <sup>2</sup>	
Deciduous Shrubland <sup>1</sup>		Spalding's Catchfly <sup>1</sup> Yellow-billed Cuckoo <sup>1</sup> Lewis' Woodpecker <sup>1</sup>
Montane Grassland <sup>1</sup>		Water Howellia <sup>1</sup> Waterfowl Production Areas <sup>1</sup>
Floodplain / Riparian <sup>1</sup>		
Wetlands <sup>1</sup>	Bog/Fen <sup>1</sup> Depressional Wetlands <sup>1</sup>	
Lotic Waters <sup>1</sup>	Intermountain Valley Rivers <sup>1</sup> Intermountain Valley Streams <sup>1</sup> Mountain Streams (Headwaters) <sup>1</sup>	Cutthroat Trout <sup>1</sup> Bull Trout <sup>1,2,3</sup> Redband Trout <sup>1</sup> Meltwater Ledrian Stonefly <sup>1</sup> Lake Trout <sup>1</sup>
Lakes and Reservoirs <sup>1</sup>	Grizzly Bear <sup>1,2,3</sup>	
Meso-Carnivores <sup>1</sup>		Wolverine <sup>1,2,3</sup> Canada Lynx <sup>1,2,3</sup> Fisher <sup>2</sup>
Refuge and breeding ground for native birds <sup>1</sup>	Migratory Birds (FWS - LT) <sup>1</sup>	Waterfowl <sup>1</sup>
Sensitive Plants <sup>1</sup>		Water Howellia <sup>1</sup> Spalding's Catchfly <sup>1</sup>
Ecological Connectivity <sup>4</sup>	Big Game Corridors <sup>4</sup>	Mule Deer Rocky Mountain Elk Pronghorn
Ecological Processes	Productivity	Net Primary Productivity
	Physical/Nutrient Cycles	Water Cycle Carbon Cycle
	Phenology	
	Disturbance Regimes	Wildfire
Ecosystem Services		
Working Landscape <sup>1</sup>	Timber Economy <sup>4</sup>	Fiber supply <sup>1</sup> Quarry Rock <sup>1</sup>
Fish and Wildlife-based Recreation <sup>1</sup>	Hunting Access <sup>1</sup> Fishing Access <sup>1</sup>	Disabled person access <sup>1</sup>



# Frame the Design

## DRAFT Proposed Landscape Features

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	Intermountain Valley Streams <sup>1</sup>	<b>Cutthroat Trout<sup>1</sup></b>
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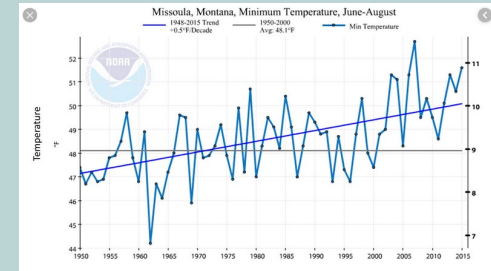
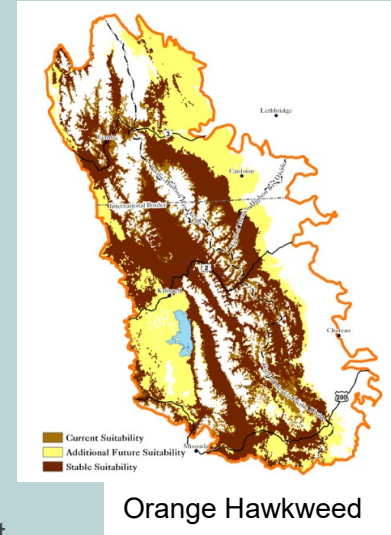
Sensitive Plants <sup>4</sup>		Water Howellia <sup>3</sup> Spalding's Catchfly <sup>3</sup>
<b>Wildlife Habitat Integrity &amp; Ecological Connectivity<sup>4</sup></b>	Big Game Corridors <sup>4</sup>	Mule Deer Rocky Mountain Elk Pronghorn
	Ecological Processes	Productivity Physical/Nutrient Cycles Phenology Disturbance Regimes
		Net Primary Productivity Water Cycle Carbon Cycle <b>Fire on the Landscape</b> <b>Invasive Species</b> <b>Insects and Disease</b>
<b>Ecosystem Services</b>	<b>Watershed Integrity and Resilience</b>	
Working Landscape <sup>4</sup>	Timber Economy <sup>4</sup>	Fiber supply <sup>4</sup> Quarry Rock <sup>4</sup>
Fish and Wildlife-based Recreation <sup>3</sup>	Hunting Access <sup>3</sup> Fishing Access <sup>3</sup>	Disabled person access <sup>3</sup>
<b>Landscape Conservation Design</b>	Resilient Ecofacets	

- <sup>1</sup> Montana State Wildlife Action Plan    <sup>3</sup> US Fish and Wildlife Service  
<sup>2</sup> Crown Managers Partnership    <sup>4</sup> Proposed at Helena meeting

# Assess Current Condition & Desired Future Condition

## Built Around Shared Vision and Focal Landscape Features

- What do we know about current state of selected features in terms of:
  - Human populations, land uses, biological communities, ecosystem processes, threats to sustainability?
    - Data compilation & evaluation ... what do we have and what's reliable? What is missing – and critical
    - What is the status and trend of focal landscape features? What are we worried about right now?
    - Key Ecological and Socio-Economic Attributes and measurable indicators
- What are our projections of these features in the short and long term?
  - Based on current status, what trends would we like to see?
    - **SMART** goal setting ( **S**pecific, **M**easurable, **A**ttainable, **R**elevant, **T**ime-bound )



# Current Condition & Desired Future:

## [Columbia Plateau]

- Coordinated input of ~150 NR professionals representing 45 local, state, fed, Tribal and NGO organizations
- Assembled priorities; synthesized by habitat associations (coarse filter)
  - Shrub-steppe and dry grassland
  - Depressional wetlands
  - Riverine Systems
  - Transitional woodlands
  - Cliffs, Talus and Caves
- Identified taxa of concern not adequately represented by above (fine filter)
  - Grouse
  - Burrowing animals

- Mapped features using best available data
- Evaluated relative viability using Open Standards process



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*Viability and Integrity Summary*

Focal System or Species	Landscape Context	Condition	Size	Viability/Integrity
<i>Shrub Steppe and Dry Grasslands</i>	Fair	Fair	Poor	Fair
<i>Riverine Systems</i>	Unknown	Unknown	Unknown	Unknown
<i>Depressional Wetlands</i>	Fair	Fair	Fair	Fair
<i>Dunes</i>	Poor	Fair	Poor	Poor
<i>Transitional Woodlands</i>	Fair	Fair	Poor	Fair
<i>Cliffs, Talus and Caves</i>	Good	Unknown	Good	Good <sup>1</sup>
<i>Grouse</i>	Poor	Poor <sup>2</sup>	Poor	Poor
<i>Burrowing Animals</i>	Poor	Poor	Fair	Poor
<b>Overall Viability/Integrity</b>				Fair <sup>3</sup>

<sup>1</sup> This overall rank assumes that the condition of the vegetation in and around cliffs, talus and cave systems is no worse than other focal systems' condition – i.e. fair.

<sup>2</sup> Population growth rates for Sharp-tailed Grouse are high, due in part to translocation of birds from other states. However, natural growth rates for Sage-grouse are low, particularly in the Joint Base Lewis-McChord Yakima Training Center population.

<sup>3</sup> The overall viability/integrity of the system would be considered "fair" under all possible scenarios of integrity of the riverine systems (i.e. if the riverine systems' integrity were found to be poor, fair, good or even very good).



# Current Condition & Desired Future:

## [Columbia Plateau]

- Key Ecological Attributes (e.g., patch size) used to hypothesize a range of possible futures Poor-Very Good
- “Good” or better established as a **desired future condition**
- Spatial data describing KEA then stacked – the outcome identifying locations that retain desired conditions for focal conservation feature

## Shrub-Steppe

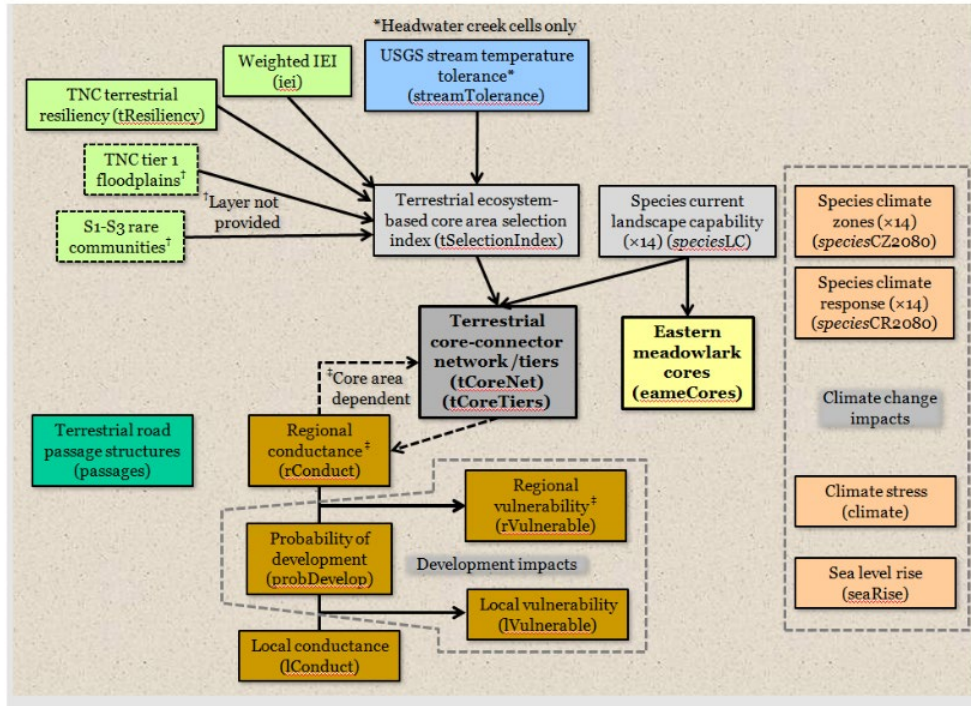
Key Ecological Attribute	Indicator	Poor	Fair	Good	Very Good	Information Source
Absolute Size	Patch size (acreage of shrub steppe)	Small (<40 ac; 16 ha)	(40-500 ac; 16-202 ha).	Large (500-1,000 ac; 202-405 ha)	Very Large (>1,000 ac; 405 ha)	Expert opinion (ALI 2014)
Landscape Pattern and Structure	Acreage of land surrounding large patches that is in semi-natural condition	Relictual: Natural or semi-natural habitat makes up <20% of land in a 500 m buffer around the patch	Fragmented: Natural or semi-natural habitat makes up 20-60% of land in a 500 m buffer around the patch	Variegated: Natural or semi-natural habitat makes up 60-90% of land in a 500 m buffer around the patch	Intact: Natural or semi-natural habitat makes up 90-100% of land in a 500 m buffer around the patch	Faber-Langendoen et al. 2008; Comer and Hak 2009
Connectivity	Acreage of land in large patches connected to other large patches	Isolated: No patches within 20 km cost weighted distance (100% dispersal capacity of grouse - larger movement species target)	Partially connected: One or more patches are within 20 km cost weighted distance (100% dispersal capacity of grouse - larger movement species target)	Connected: Two or more patches are within 1 km cost weighted distance (~100% dispersal capacity of burrowing animals - smaller movement species target). <sup>3</sup>		Follows rationale developed for WWHCWG's Statewide Analysis (WHCWG 2010)
Fire Regime	Departure from historical fire regime	>50% of total acreage of patches is in LANDFIRE Vegetation Condition Class (VCC) 3	Most (>60%) of total acreage of patches is in LANDFIRE VCC 2; <30% of total acreage of patches is in VCC 3	Most (≥60%) of total acreage of patches is in VCC 1; <10% of total acreage in VCC 3 <sup>4</sup>	>80% of total acreage of patches is in VCC 1	Based on ALI calculations; see ALI 2014 for details.
Relative Size	Acreage in shrub steppe ecological systems	Shrub steppe (target) is severely reduced from its original natural extent (<50% remains)	Shrub steppe (target) is substantially reduced from its original natural extent (50-80% remains)	Shrub steppe (target) is only modestly reduced from its original natural extent (80-95% remains)	Shrub steppe (target) is not reduced or is minimally reduced from natural extent (>95% remains)	Faber-Langendoen et al. 2008



# Best available data ...

## [Connect the Connecticut – Nature's Network]

### DSL Project Component: Landscape Conservation Design



## Examples from the Crown:

- Crown Managers Partnership Data array
- LANDFIRE & other landcover data
- ALCES Online
- GAP stewardship
- Housing Density (Headwaters Econ.)
- NorWeST Stream Temps
- Climate projection & derivations
- Topo-climate models
- Climate Velocity
- Fire occurrence and vulnerability
- Connectivity models
- Natural Heritage wildlife observation
- Sensitivity & Adaptive Capacity
- Habitat Suitability models

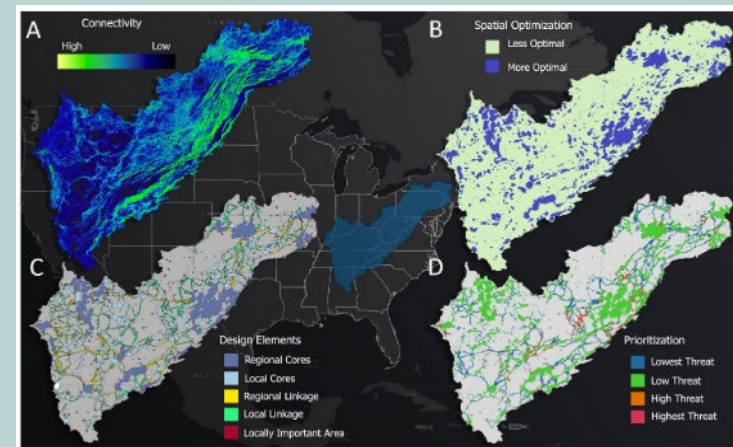
etc ...

# Spatial Design

## [Appalachia]

### Primary Tool to Address the “Where?”

- Typically, for this exercise we take the ownership and jurisdictional lines off the map
  - Not to say sovereignty, land ownership, organizational mandates, authorities and local needs and expectations are not considered!!
  - Rather, we use the data to tell us about opportunity and costs across the landscape
  - Call this “optimization” modeling in that we seek to project a landscape of the future that optimizes our shared vision and the goals we collectively estimated for the focal landscape feature



**Where might we achieve shared goals for the least possible cost?**

# Spatial Design

## Optimization Models

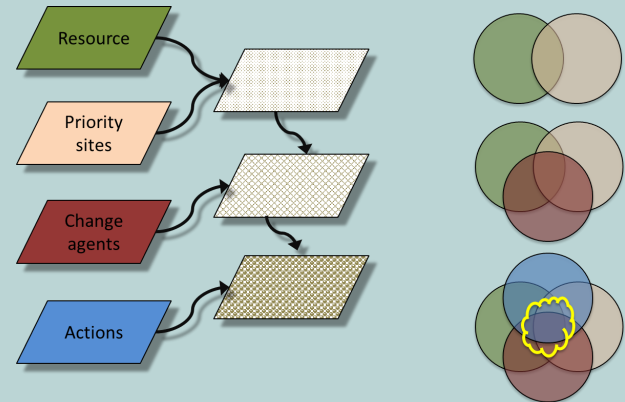
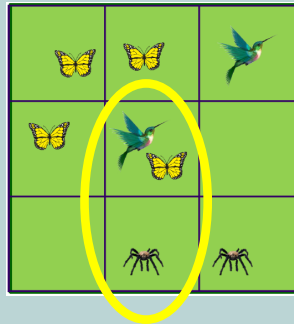
Concept used in a range of sectors including business investment, biotechnology, metallurgy, agriculture, medicine, sociology and a variety of natural resource decisions

### Marxan with Zones

The minimum set problem = capture some minimum representation of features for the least cost



Planning Unit (n = 9)



**optimization problem:** the problem of finding the *best* solution from among the set of all *feasible* solutions.



# Modeling an Optimized Landscape

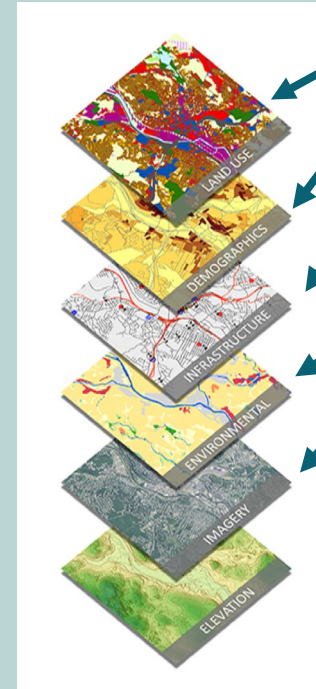
Software Options include Marxan, Zonation

Sum of selected Planning Unit Costs...

Total perimeter of selected Planning Units

Total penalty you'll 'pay' for not meeting all targets (i.e., how "good" is solution?)

$$\underbrace{\sum_{PUS} Cost}_{1} + \text{BLM} \underbrace{\sum_{PUS} Boundary}_{2} + \underbrace{\sum_{Con.Targ.} SPFxPenalty}_{3} = \text{Score} \quad \text{Marxan}$$



Spatial data for landscape features

Barriers or "Costs" to achieving targets

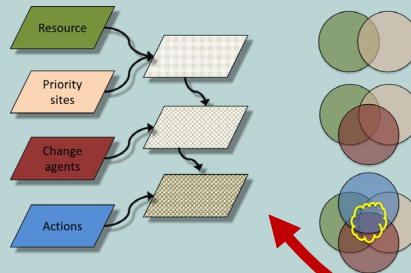
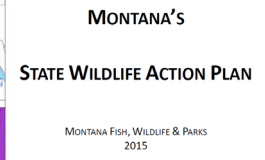
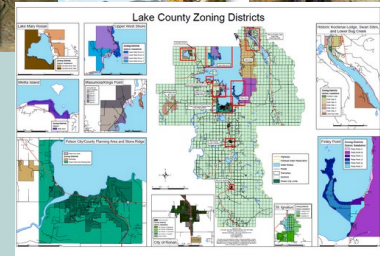
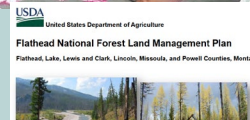
A Solution –  
**but is it a good one?**

Iterations of iterations .....

# Spatial Design to Strategy

**A good design is one partners and stakeholders:**

- See their vision realized
- Recognize their Mission and Management Plans in landscape-scale design
- Envision their roles and strengths
- Recognize potential contributions to a future sustainable landscape

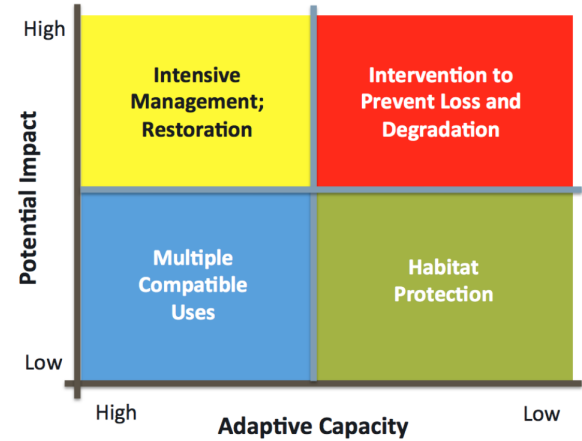


**Evaluate, Deliberate, Adjust**

# Strategy Design

## Bring in the “Who” and focus on the “How”

- As we begin to see our vision of the future depicted on maps of the landscape we – again ... collectively– start to see emergent aspects of the landscape features
  - Opportunities and costs we may not have envisioned when looking
    - Jurisdiction by jurisdiction
    - Species by species
    - Threat by threat
    - Opportunity by opportunity
- Elements of the developing Spatial Design are evaluated in the context of jurisdictional plans (SWAP, Forest Plans, County Zoning, Infrastructure, etc)
- We may also see on draft Spatial Designs clear “NO GO” aspects
  - That’s OK ... we adjust and iterate

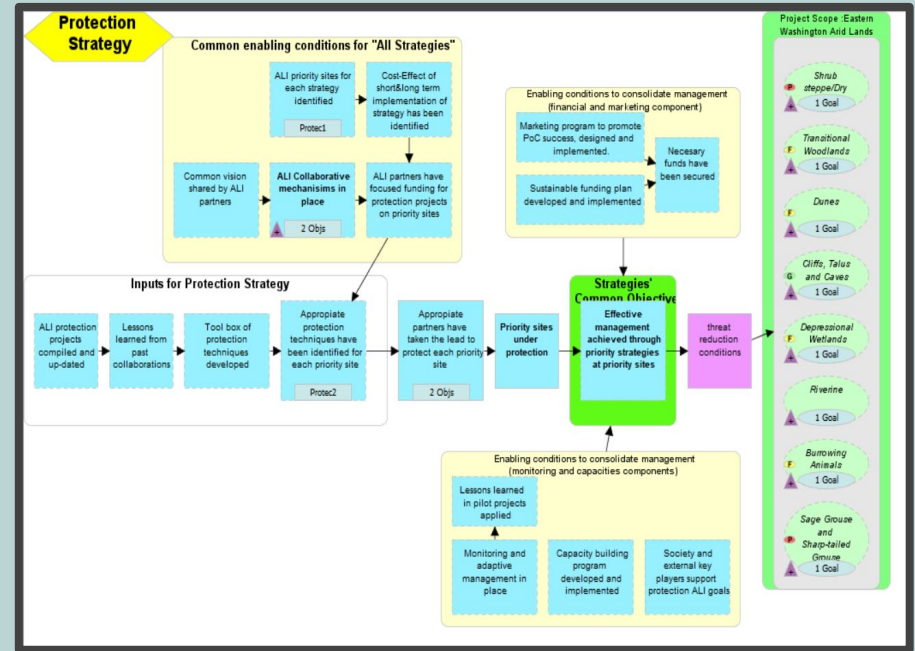


**Figure 8.** An illustration of the potential range of management actions that might be chosen for a location (e.g., HUC12) depending on its potential impact and adaptive capacity.

# Strategy Design

## [Columbia Plateau]

- “Results Chains” articulate different sets of strategies.
  - *Restoration, Protection, Grazing, Agriculture, Alternative Energy, etc.*
- Mapped segments of landscape where strategy meets opportunity.
  - *Where do protection, restoration, fire and climate adaptation strategies make the most sense?*
- Important to maintain facilitation/coordination that is focused on developing “on the ground” strategies.

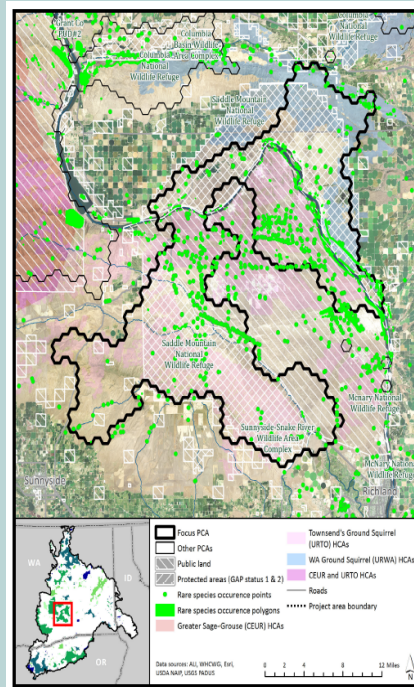




# Strategy Design

## [Columbia Plateau]

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### Hanford PCA (#171), Pleistocene Lake Basins Ecoregion

#### Contribution to ALL targets

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

#### Connectedness

- N P** Greater Sage-Grouse network
- N P** Sharp-Tailed Grouse network
- H** Townsend's Ground Squirrel network
- H** Washington Ground Squirrel network
- H** General permeability to movement

#### Current threats

- M L** Invasive annual grasses
- M** Road density

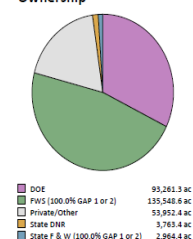
#### Fire risk

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

#### Future non-climatic threats

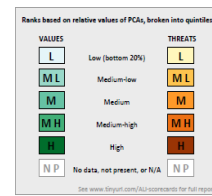
- M L** Development pressure
- M L** Wind power potential
- L** Agricultural conversion pressure

#### Ownership



#### Climate Change Vulnerability

- M** Overall vulnerability
- M H** Exposure
  - M** Temperature climate velocity
  - H** Multivariate climate velocity
- H** Sensitivity
  - N P** Sage-grouse contraction
  - N P** Sharp-tailed grouse contraction
  - M** Big sagebrush contraction
  - M** Climate sensitive targets index
  - H** Vegetation instability
- H** Adaptive capacity
  - M H** Climate change resilience
  - H** Percent permanently protected
  - H** Landscape condition model



# Implementing a Design

## [Columbia Plateau]

### Federal Coordination on Post-Fire Response

The Bureau of Land Management and the US Fish and Wildlife Service have been coordinating on post-fire response. The 2016 Range 12 fire in south-central Washington burned 175,000 acres, including both BLM and USFWS-managed lands. Though each agency has its own mandate and requirements, they coordinated and discussed their Emergency Stabilization and Rehabilitation plans. The Range 12 fire was partially the



### Washington Department of Fish and Wildlife (WDFW) and US Department of Agriculture (USDA) – State Acres for Wildlife Enhancement (SAFE) program

SAFE is a USDA initiative focused on developing quality wildlife habitat through the Conservation Reserve Program incentive-based farm Bill conservation program. Wildlife managers provide technical assistance to producers to restore 100,000 acres of shrub-steppe a

SAFE is improving the habitat of the ferruginous hawk, pygmy woodpecker, and other species. Given the overlap between the SAFE program and the ALI's landscape goals, the program is a key component to achieving the ALI's landscape goals.

BLM & USFWS

State Wildlife

### Foster Creek Conservation District

Foster Creek Conservation District (FCCD) has a number of programs in Douglas County, Washington that help farmers and ranchers preserve their resources, including shrub steppe, which in turn contributes to ALI's shared goals. These programs include the Multiple Species General Conservation Plan for Douglas County.

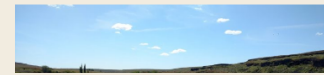


The Multiple Species General Conservation Plan allows landowners to receive certain benefits that would otherwise be lost. These benefits include the ability to graze livestock and their habitat. Using ALI science-based tools adds value to projects that not only achieve Ducks Unlimited's goals for waterfowl, but also provide benefits to other species, such as sage grouse or ground squirrels. The ALI priority areas map helps to identify areas where waterfowl habitats overlap with the ALI's shared opportunities to consider other species working with partners. One example is the Taylor area where waterfowl and sage grouse habitats overlap. FCCD uses this as a landscape level.

County Cons. District

### Ducks Unlimited – Overlapping Priorities

Using ALI science-based tools adds value to projects that not only achieve Ducks Unlimited's goals for waterfowl, but also provide benefits to other species, such as sage grouse or ground squirrels. The ALI priority areas map helps to identify areas where waterfowl habitats overlap with the ALI's shared opportunities to consider other species working with partners. One example is the Taylor area where waterfowl and sage grouse habitats overlap. FCCD uses this as a landscape level.



### Post-fire recovery across ownership boundaries



Sutherland Fire (2017). Photo: Richard Parrish/BLM. <https://incweb.nwcg.gov/incident/photograph/5282/4/64375/>

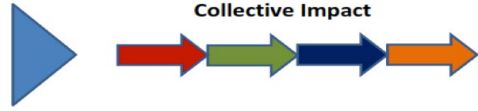
A challenge faced by land managers in the sagebrush steppe is to ensure areas that have burned are on the path to swift recovery, which may require post-fire restoration, and does not respond to ownership boundaries. In the wake of the 2017 Sutherland Fire in the Beezley Hills—which directly and indirectly impacted pygmy woodpecker recovery efforts—BLM, WDFW, and The Nature Conservancy are working on public and private land to coordinate recovery efforts. This includes installing fences and fixing fences impacted by the fire.

Collaboration

Isolated Impact



Collective Impact



NGO

# Can We Do It?



**Yes We Can!**

Convening Body:



Lead Analysts:



**What's Next?**

Roles

Tasks

Timelines

# Crown LCD: Roles

## Leadership Team

- Monthly conference calls
- Liaise with your organizational leadership
- Represent your org – landscape vision, priority features
- Timely evaluation/response (we will keep it easy)
- Identify your experts & make available
- Seek support (in kind, funds)

## Technical Team

- Monthly conference calls
- Find & share data
- Co-Design analyses
- Review Input-output streams
- Critique analyses
- Identify experts; recruit knowledge

## Subject Experts (ad hoc)

- Deliver expertise as needed
- Knowledge of species needs, landcover condition, known and emerging threats
- Targeted engagement
- Review subject-relevant strategies



# Crown LCD: Timeline (estimated)

## 2020

- January - March**
  - Confirm Leadership and Technical Teams
  - Review Management Plans
  - Data Synthesis
- April - June**
  - Crown LCD Workshop #1
  - Finalize Landscape Feature Selection
  - Complete Vulnerability Assessment
  - Develop Targets and Cost Layers
- July - September**
  - Initial Marxan Runs
  - Model Calibration
  - Additional Data Discovery
- October - December**
  - Optimization Modeling (Marxan)
  - Review Management Plans
  - Data Synthesis

## 2021

- January**
  - Spatial Design First Draft available for review
- February - March**
  - Technical Team Workshop
  - Evaluate First Draft, Adjust, Iterate
  - Optimization Models: Second Runs
  - Initiate Strategy Design
- April - August**
  - Complete Optimization Models
  - Crown LCD Workshop #2
  - First Draft Strategy Design
- September - November**
  - Review Spatial and Strategy Designs
  - Prepare Publications
  - Draft Metadata
- December 2021**
  - Design Released

# Crown LCD: Tasks



Confirm Leadership Team

Identify Technical Team Personnel

Identify LCD Geography

Select Priority Landscape Features

Schedule a Workshop (April 2020?)