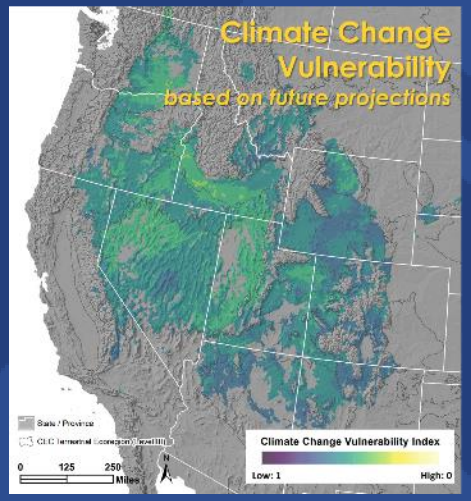
Tools for Ecological Restoration and Seed Sourcing

Colorado Plateau Native Plant Program meeting, February 5, 2018



NatureServe

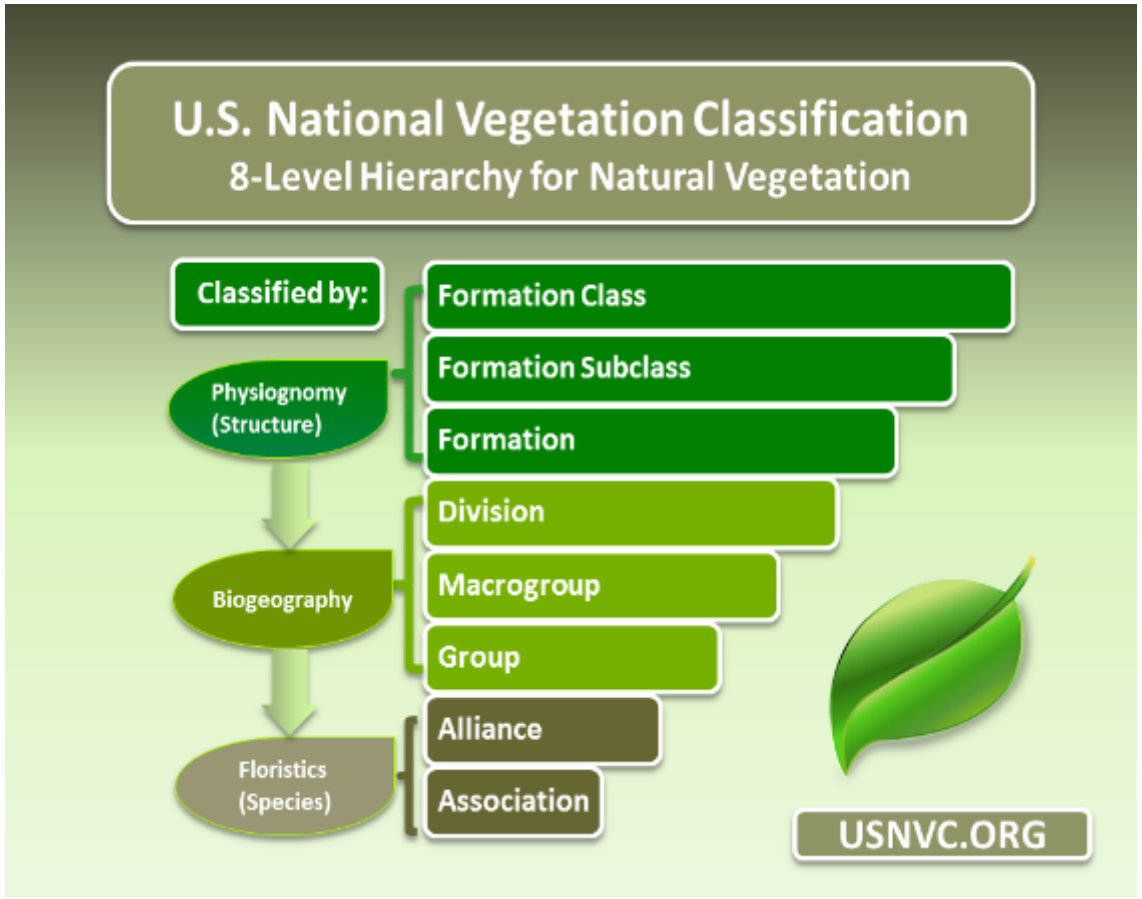
United States National Vegetation Classification
USNVC

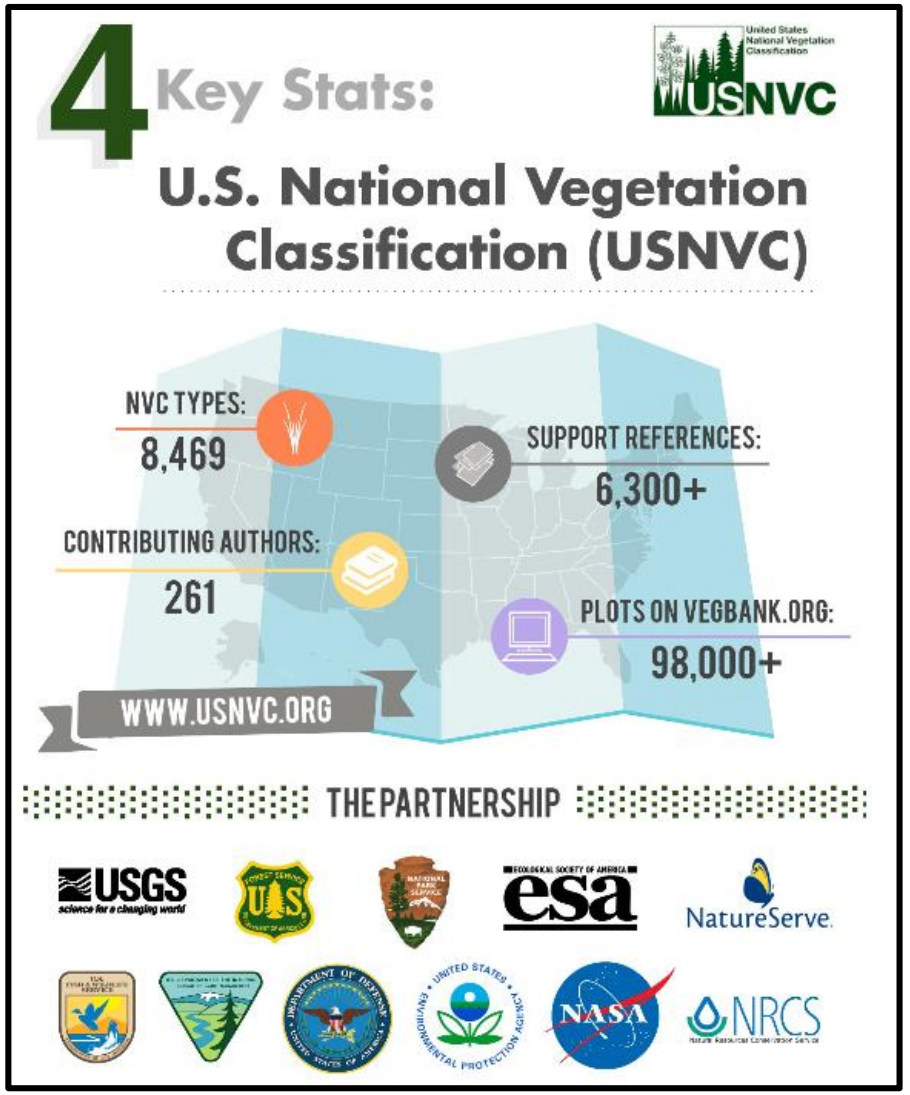
Patrick McIntyre, Senior Ecologist, Western North America

NatureServe resources and tools supporting the National Seed Strategy

- Classification and Mapping
  - **-What species to plant?**
- Vulnerability to predicted threats?
  - **-Climate, invasives, fire regime?**
- Sourcing and planning
  - **- Where to source material?**
- Integration: SeedSmart tool (expansion beyond eastern US)

US National Vegetation Classification





NVC Resources supporting restoration

Composition & cover information

Species	Constancy	Av. Cover	Range
Herbaceous			
Campanula rotundifolia	95%	1%	1
Geum triflorum	95%	3%	1-15
Poa pratensis	95%	7%	1-38
Achillea millefolium	89%	1%	1-3
Agoseris glauca	79%	1%	1-3
Elymus trachycaulus ssp. subsecundus	74%	1%	1

Field Keys

Key to USNVC Upland Macrogroups, Groups and Alliances in the Central Basin and Range Ecoregion (Selected Divisions)

1.B.2 Cool Temperate Forest & Woodland

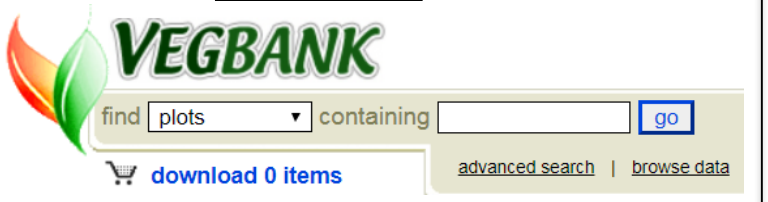
D194 Rocky Mountain Forest & Woodland

M1a. Macrogroup of high montane and subalpine forests/woodlands in mountainous regions of the western U.S. and southwestern Canada. Characteristic trees include *Abies lasiocarpa* (subalpine fir), *Larix lyallii* (subalpine larch), *Picea engelmannii* (Engelmann spruce), *Pinus albicaulis* (whitebark pine), *Pinus aristata* (bristlecone pine), *Pinus contorta* (lodgepole pine), *Pinus flexilis* (limber pine), *Pinus longaeva* (Great Basin bristlecone pine), *Populus tremuloides* (quaking aspen), and *Tsuga mertensiana* (mountain hemlock) (which is also important in Pacific maritime macrogroups). Varies from nearly closed-canopy forests to very open or patchy short-statured woodlands, clumps of tree islands or ribbons with intervening grasslands or shrublands near upper treeline.....**G2**

.....**M020 Rocky Mountain Subalpine-High Montane Conifer Forest**

M1b. Conifer and mixed deciduous-conifer macrogroup of lower montane forests, woodlands and savannas of the southern Rocky Mountains, Colorado Plateau, and Great Basin. Characteristic trees include *Abies concolor* (white fir), *Juniperus scopulorum* (Rocky Mountain juniper), *Pinus ponderosa*

Plot Data



Special-status Species

At-Risk Species Reported for this Association	
Scientific Name (Common Name)	**NatureServe Global Status**
Penstemon pudicus (Kawich Range Beardtongue)	G1

BLM User Guide -NVC


Photo by Penn State Univ


Photo by Marion Reid

A BLM VEGETATION GUIDEBOOK FOR THE U.S. NATIONAL VEGETATION CLASSIFICATION


Photo by Jon Wiley

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT


Photo by Matt Lavin

A supplement to the Integrated Vegetation Management Handbook, including guidance on plot data inventory, vegetation mapping, and assessment and monitoring of rangeland condition.

NatureServe


Photo by Bryant Olsen

BLM Guidebook Chapters


Photo by Penn State Univ

TABLE OF CONTENTS


Photo by Matt Lavin


Photo by Jon Wiley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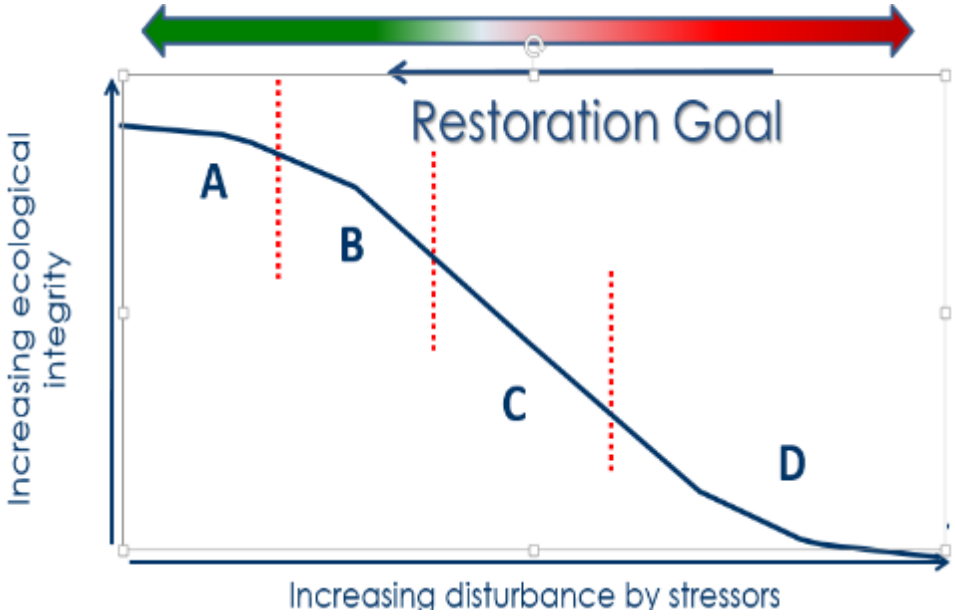
7 Planning Vegetation Management

- ✓ BLM Planning & the NVC
- ✓ extent of types, rare types
- ✓ attributes of condition such as fire regime departure
- ✓ fuels management
- ✓ Desired condition of types
- ✓ Native plant composition
- ✓ Sourcing plant materials



HCCVI Assesment

Sensitivity

Adaptive Capacity

Resilience Score

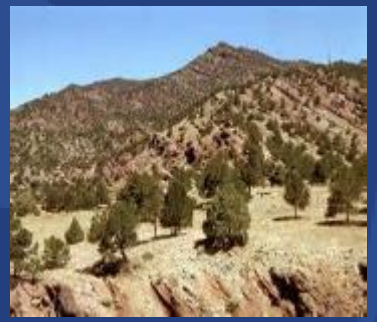
Exposure

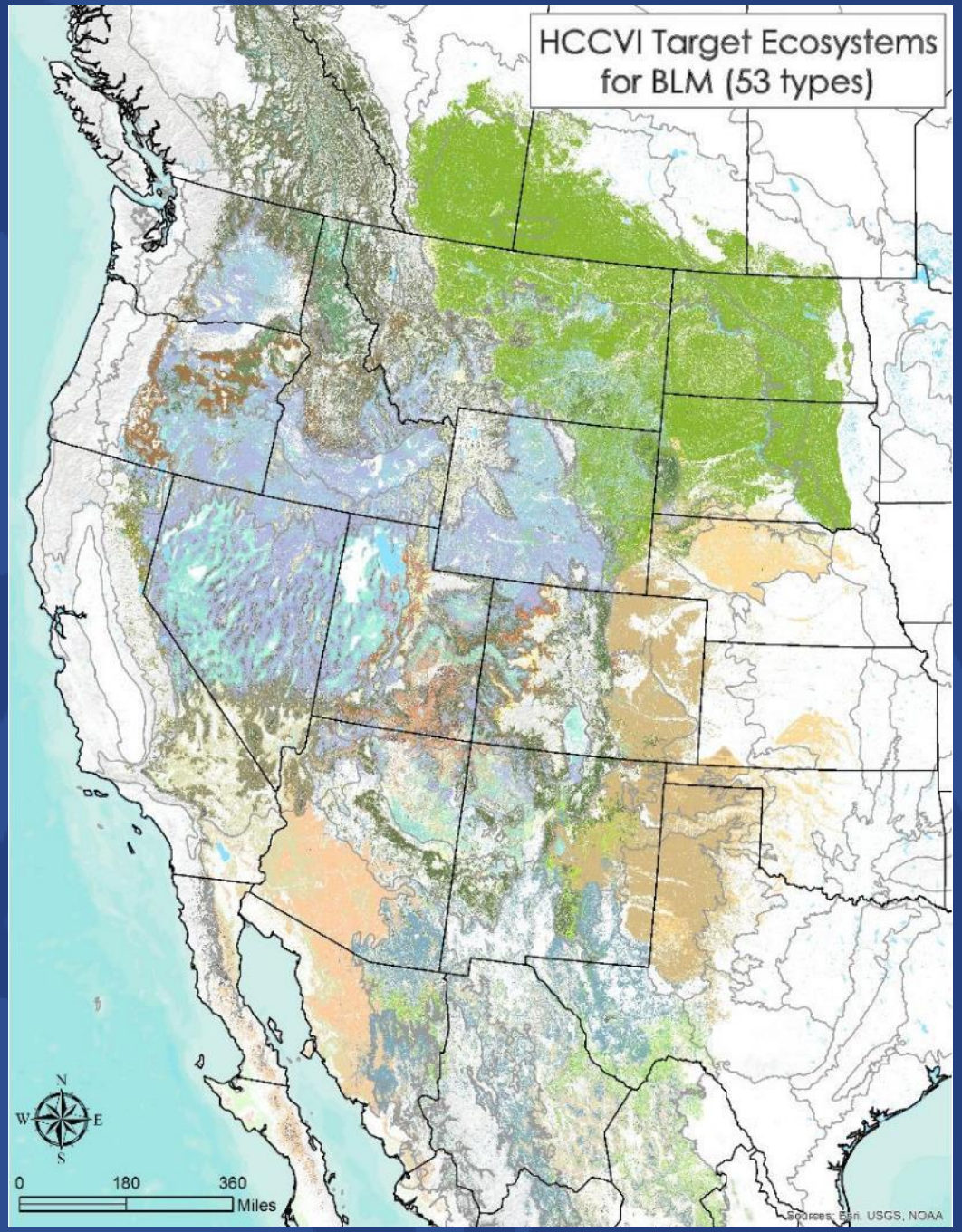
Exposure Score

Resilience \ Exposure			
	LH	MH	HH
	LM	MM	HM
	LL	ML	HL

Vulnerability:
Very High, High,
Moderate, Low

"by area…today, or by mid-century"





United States National Vegetation Classification
USNVC

Ecological Systems

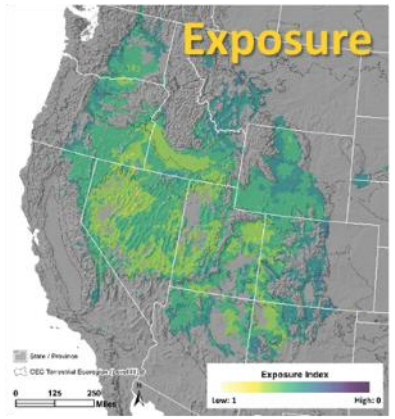
LANDFIRE

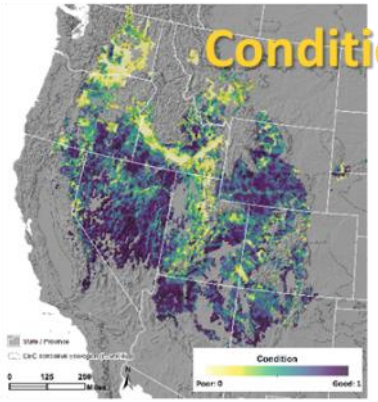
HCCVI Assesments

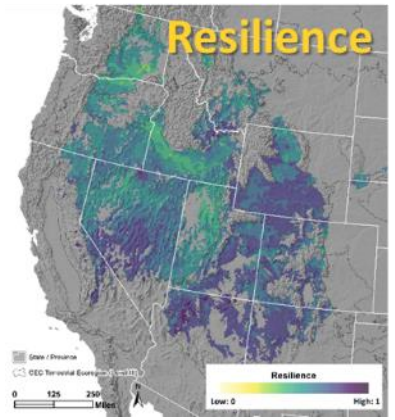
Tech. Report

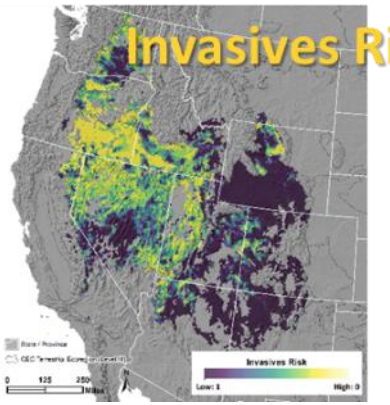
DATA BASIN

GIS Layers









Vulnerability

State / Province

CEC Terrestrial Ecoregion (Level III)

0 125 250 Miles

N

Climate Change Vulnerability Index

Low: 1 High: 0

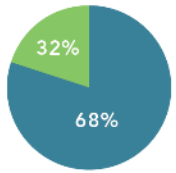
Intermountain Basins Big Sagebrush Shrubland

CLIMATE CHANGE VULNERABILITY

INTERMOUNTAIN BASINS
BIG SAGEBRUSH SHRUBLAND

HOW VULNERABLE IS IT?

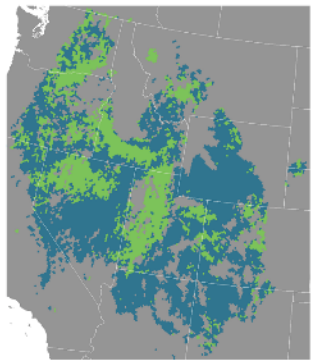
BASED ON A COMPARISON OF CLIMATE CONDITIONS FROM 1981–2014 COMPARED TO A 20TH CENTURY BASELINE PERIOD (1948–1980). Vulnerability to climate change is a combined measure of climate change exposure and relative ecological resilience. High exposure and/or low resilience lead to high vulnerability to the effects of climate change.



PROPORTION OF THE DISTRIBUTION BY VULNERABILITY CATEGORY.

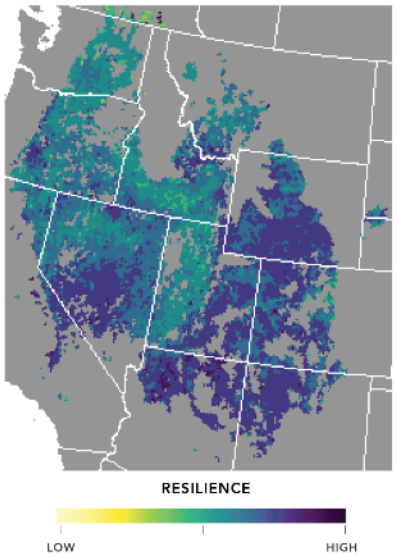
VULNERABILITY

- VERY HIGH
- HIGH
- MODERATE
- LOW

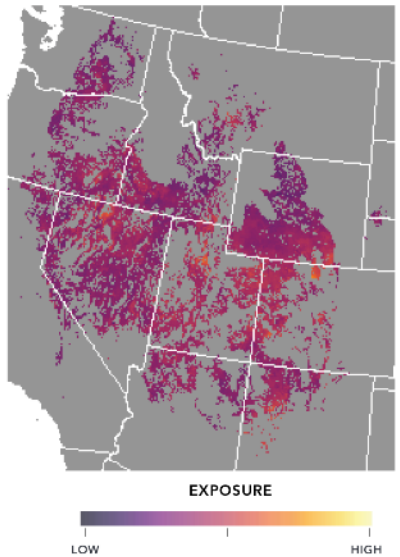


HABITAT CLIMATE CHANGE VULNERABILITY INDEX (HCCVI) result for this ecosystem summarized by 100 km2 hexagon.

WHY IS IT VULNERABLE?



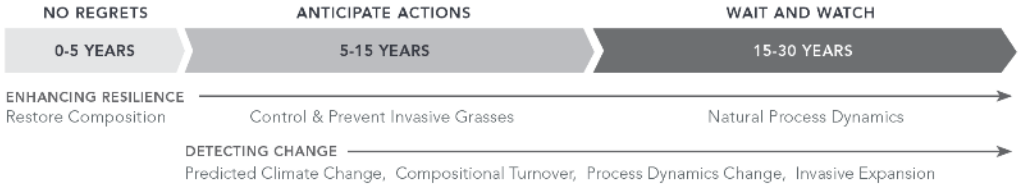
OVERALL RESILIENCE MAP RESILIENCE measures non-climate ecosystem stress and adaptive capacity. Areas of lower resilience (light green on the map) currently have high risk for invasive plants, fragmentation and altered fire regimes.



CLIMATE EXPOSURE for the ecosystem is a single index of exposure to climate change. Where exposure is high (red on the map), the species comprising the ecosystem are currently exposed to stress due to climate change.

WHAT CAN WE DO?

CLIMATE SMART MANAGEMENT TIMELINE Resource managers are confronted with the need to identify actions to respond to climate change now and 30 years in the future. In the short term, managers should aim to enhance resilience by maintaining or restoring species composition, dynamic processes, and connectivity. In the longer term, it will be necessary to detect ecosystem change in response to both climate change effects and management actions.



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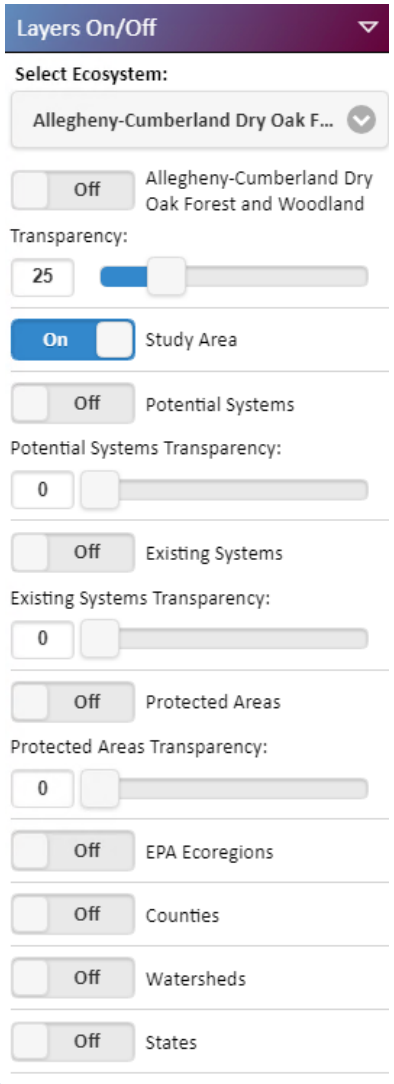
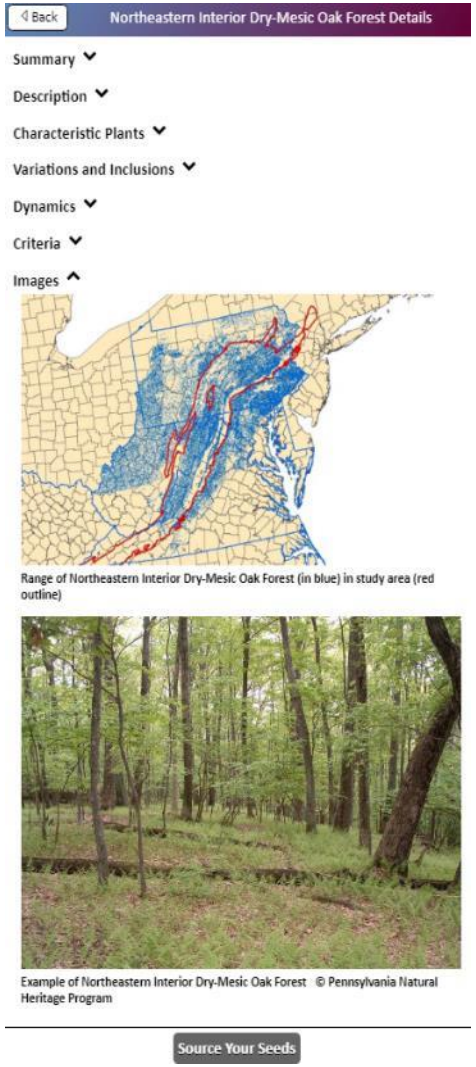
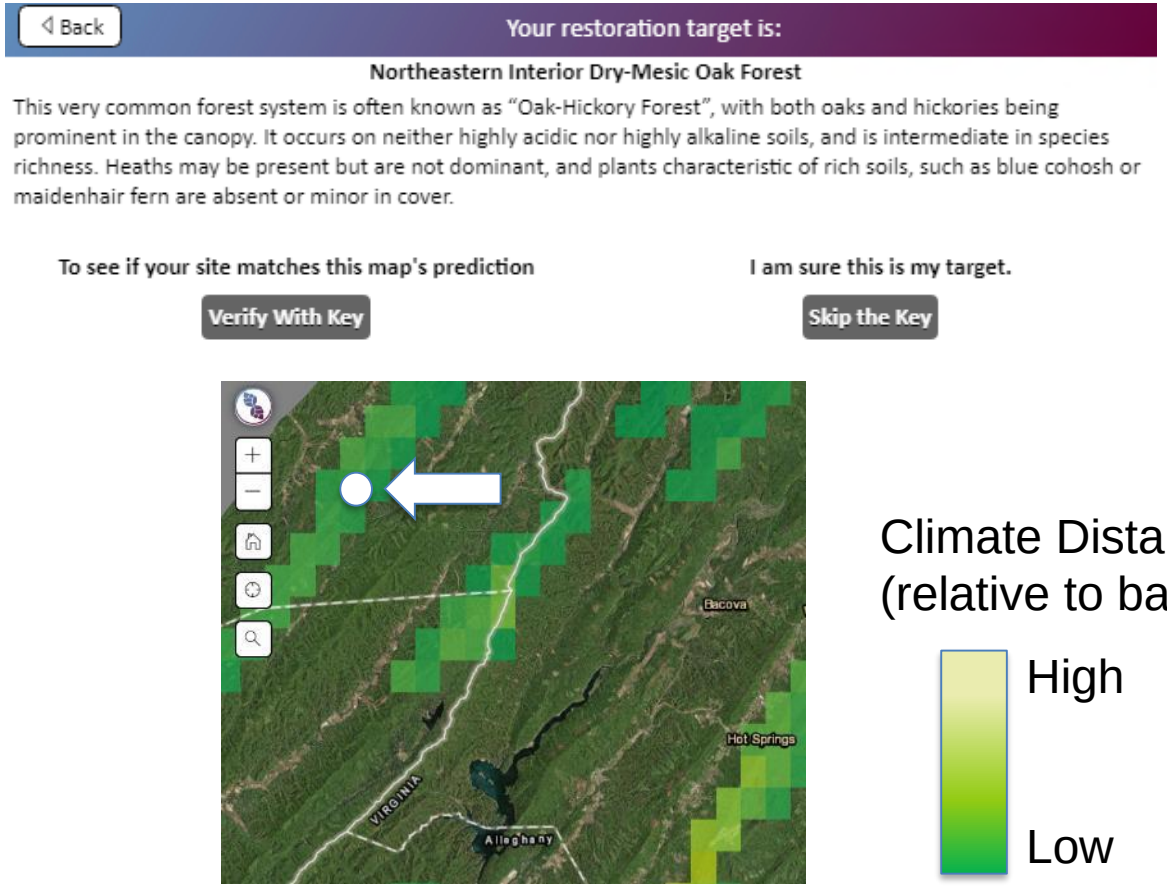
A Network Connecting Science With Conservation

Integrating Resources for Seed Sourcing

2017 Pilot launched for Eastern US-Appalachian Ridge & Valley









It's a team effort!

Healy Hamilton, chief scientist
Pat Comer, chief ecologist
Marion Reid, vegetation ecologist
Stephanie Auer, bioclimate analyst
Jon Hak, spatial modeler/ecologist
Regan Smyth, landscape ecologist
Keith Schulz, vegetation ecologist

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