



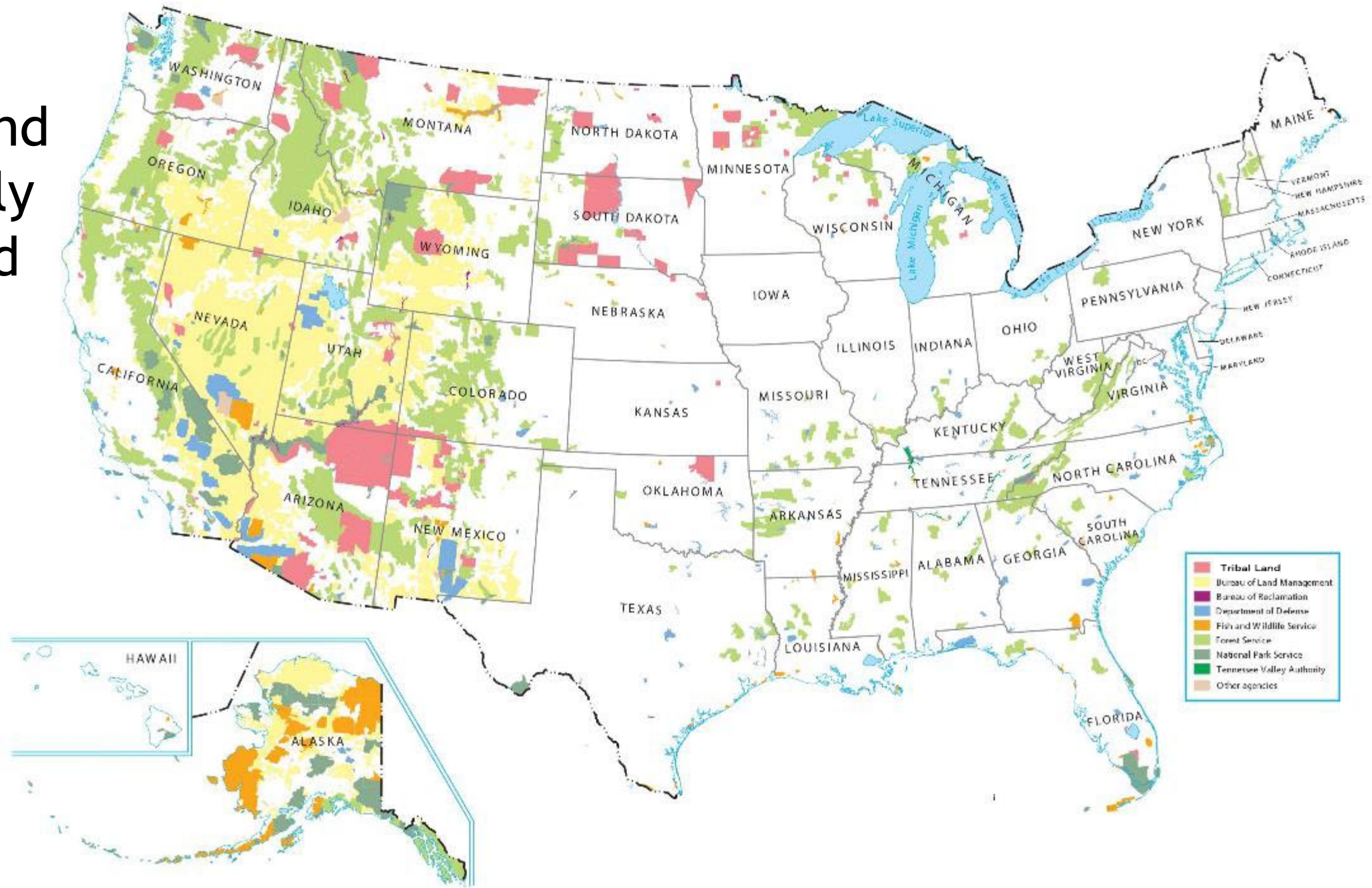
Climate Change Adaptation & Mitigation in the Forest Service

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Mission of the Forest Service: to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

Forest Service motto is: "Caring for the Land and Serving People"

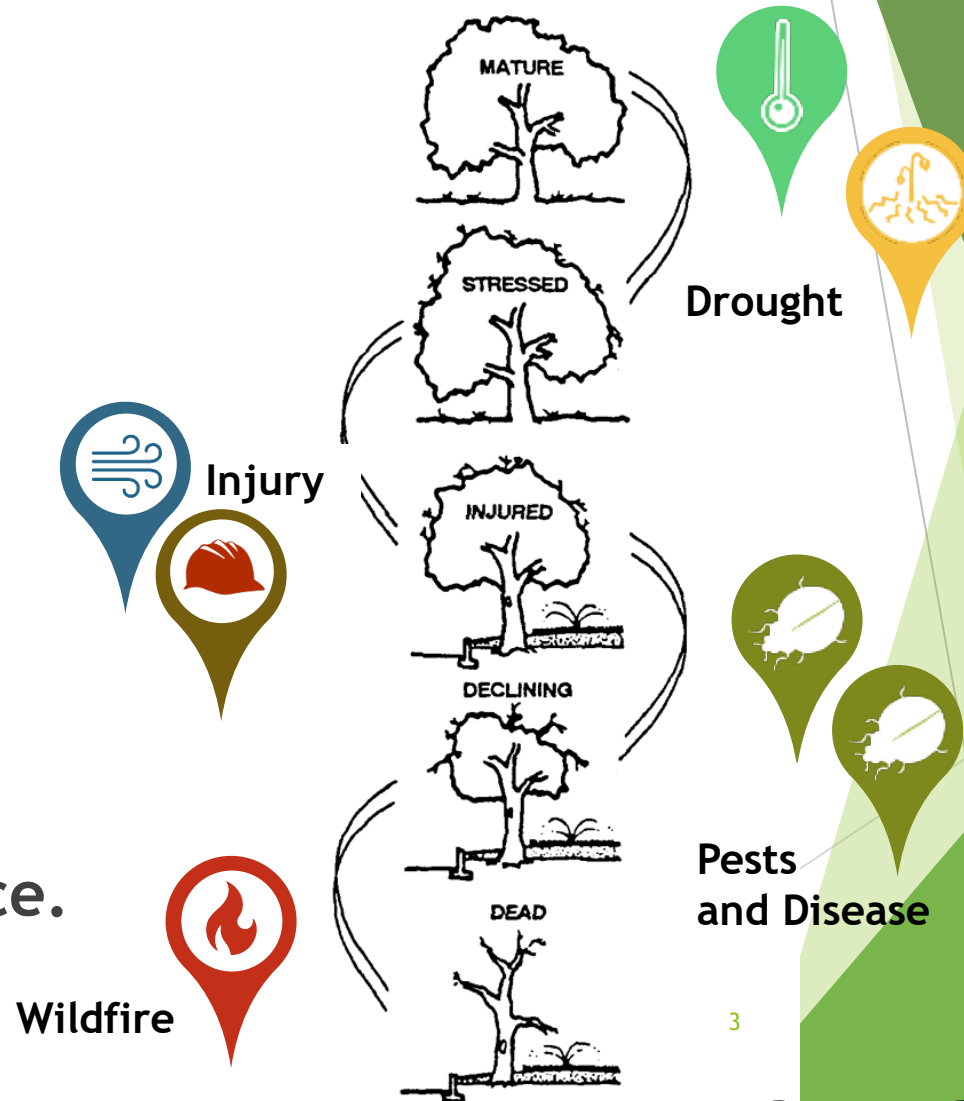
Tribal and Federally Managed Lands



Climate change is a “threat multiplier”

- ▶ Chronic stress
- ▶ Drought
- ▶ Storms
- ▶ Insect pests
- ▶ Forest diseases
- ▶ Sea level rise
- ▶ Invasive species
- ▶ Wildfire

Interactions make all the difference.



Primary Approaches

▶ Adaptation

▶ Mitigation

Adaptation is the adjustment of systems in response to climate change.



- *Adaptation actions* are designed to intentionally address climate change impacts & *vulnerabilities* in order to meet goals and objectives.
- Ecosystem-based adaptation activities build on existing knowledge.

Wildfire Crisis Strategy

- ▶ Firesheds - large forested landscapes (~250k ac) and rangelands with a high likelihood that an ignition could expose homes, communities, and infrastructure to wildfire.
- ▶ Wildfire Risk Reduction Infrastructure Team to build on capacity to carry out projects.
 - ▶ Treat the firesheds at highest risk first then move on to other western firesheds
 - ▶ Accelerating treatments over 10 years.
 - ▶ Build capacity (FS and partners)
- ▶ Work with partners to:
 - ▶ Treat up to an additional 20 million acres on National Forest System lands over the next 10 years.
 - ▶ Treat up to an additional 30 million acres of other Federal, State, Tribal, and private lands.
 - ▶ Develop a plan for long-term maintenance beyond the 10 years.



Region 3 Climate Change Adaptation Framework



Overview of Climate Change Vulnerability Assessments

- ▶ What are CCVAs?
 - ▶ Evaluate **exposure, sensitivity and adaptive capacity** of ecosystems and values in response to changing climates.
 - ▶ Vulnerability assessments provide a means for evaluating risk
 - ▶ *Quantitative* vulnerability assessments have the added value of providing a means for evaluating comparative risk across landscapes and resources.
- ▶ Why CCVA?
 - ▶ Climate change represents a unique challenge for natural resource management. Better understanding of vulnerability can inform management approaches, help prioritize efforts, and better understand long term expectations for dynamic systems.

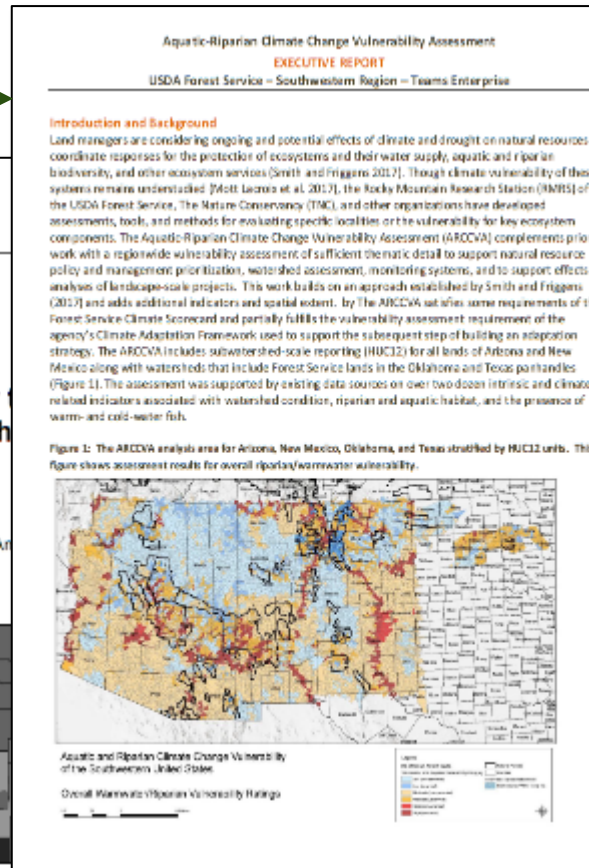
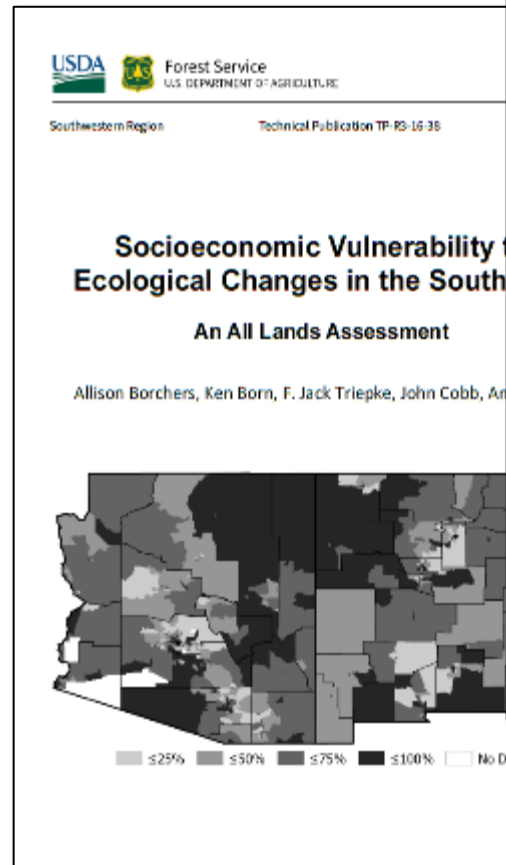
Vulnerability assessments

R3 all-lands climate vulnerability assessment trilogy

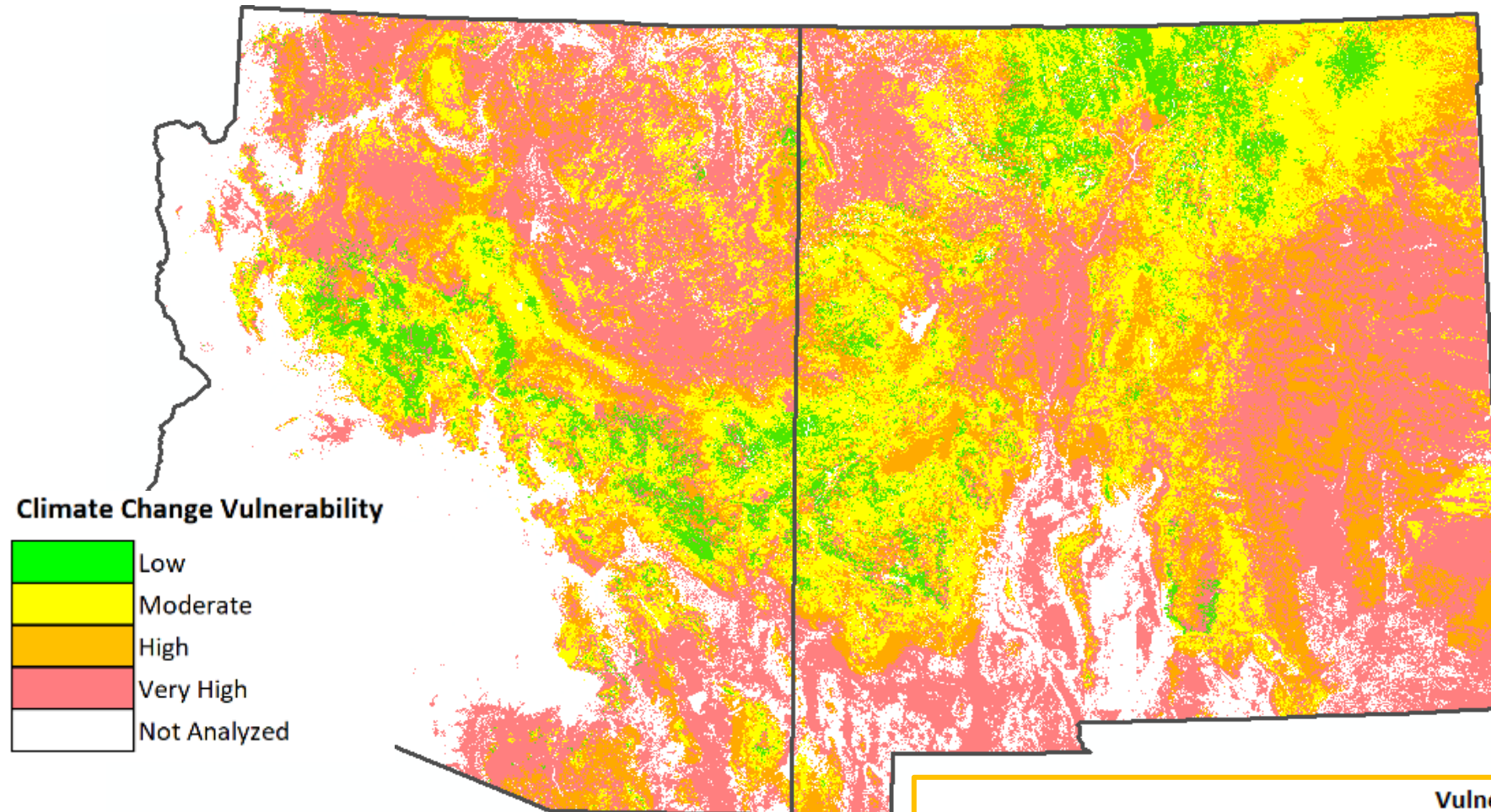
- ▶ Upland ecosystems
- ▶ Aquatic-riparian ecosystems
- ▶ Socioeconomic

Common features

- Data driven
- Quantitative
- Spatial
- Linked



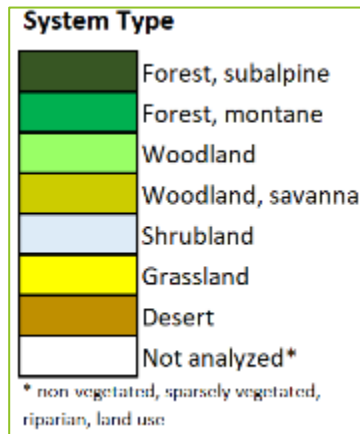
Vulnerability assessments -- *Upland ecosystems (CCVA)**



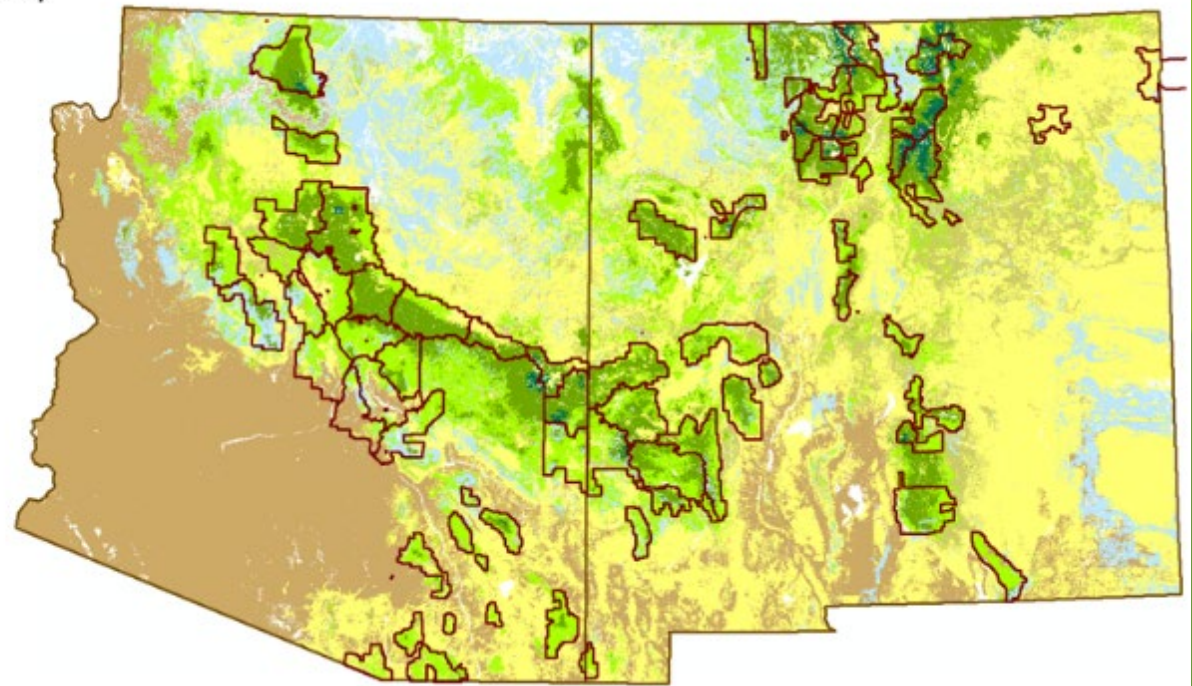
*Expected departure of future (2100) climate from reference condition climate envelope (1961 - 1999)

ERU	Vulnerability Category	%	Uncertainty Category		
			Low	Mod	High
All ERUs analyzed (588,237km ²)	Low	6%	2%	4%	0%
	Moderate	24%	1%	16%	7%
	High+	70%	48%	22%	0%
<i>Uncertainty total</i>			50%	42%	8%

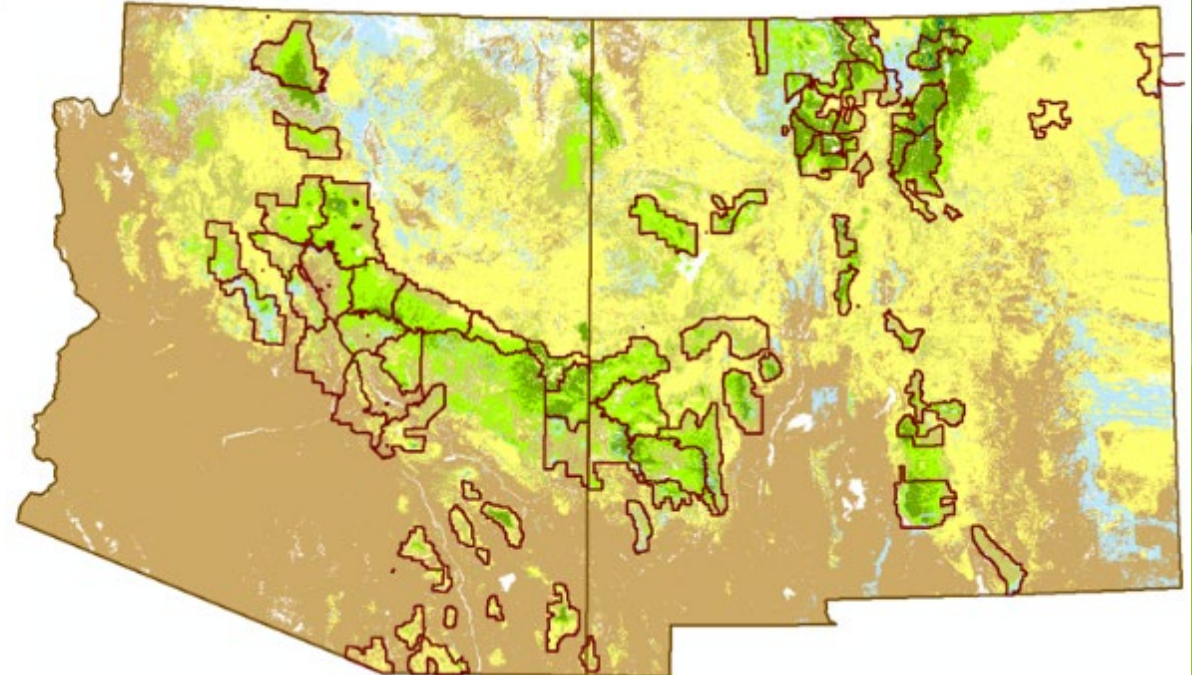
Vulnerability assessments



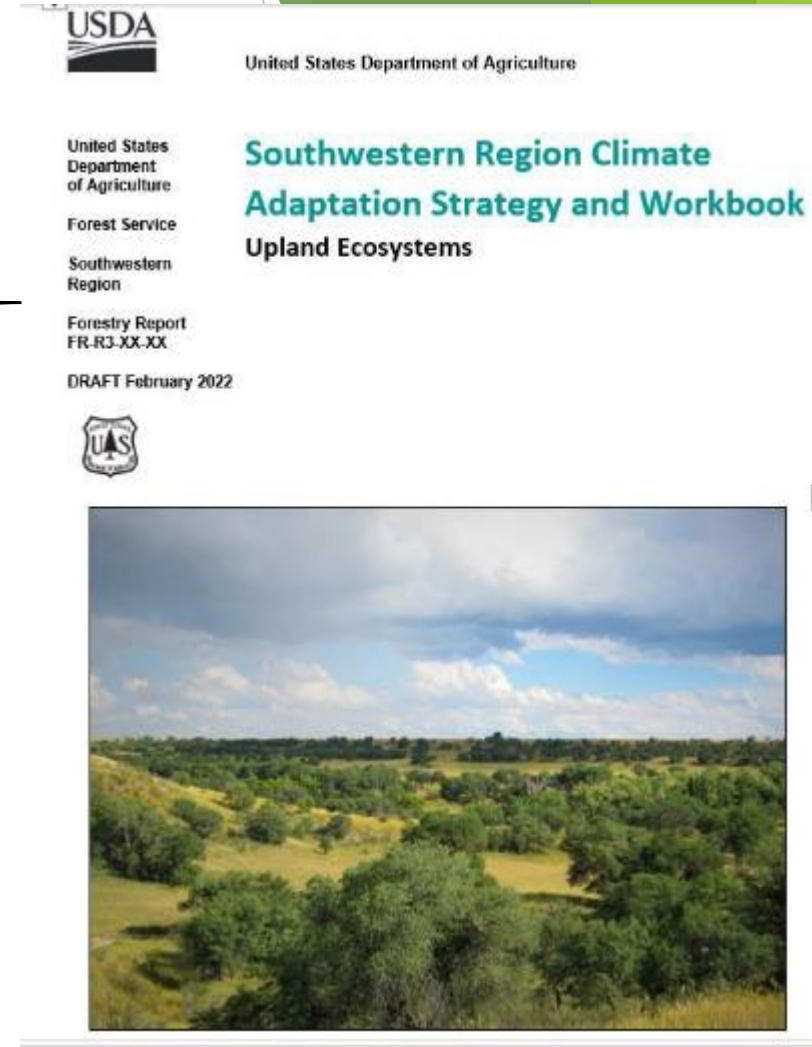
Current (2017)



Projected (2061-2090)



Climate Change Adaptation Framework



SW Fire Menu

1: Sustain fire as a fundamental ecological process – Resistance, Resilience, Transition

- 1.1: Restore or maintain fire in fire-adapted ecosystems
- 1.2: Develop fire use strategies in altered or novel ecosystems where fire can play a beneficial role

2: Reduce biotic and abiotic stressors affecting fire regimes – Resistance, Resilience

- 2.1: Remove and prevent establishment of non-native invasive species
- 2.2: Maintain or improve the ability of forests to resist pests and pathogens that may alter fuel regimes
- 2.3: Limit, selectively apply, and monitor land uses that increase fire risk or threaten fire resilience

3: Reduce the risk of unacceptable fire – Resistance, Resilience

- 3.1: Protect fire-sensitive and vulnerable ecosystems from fire
- 3.2: Alter forest structure and composition to reduce the risk and spread of unacceptably severe fire
- 3.3: Establish or maintain fuel breaks to stop the spread of unacceptable fire

4: Limit the effects of unacceptable fire and promote post-fire recovery – Resistance, Resilience

- 4.1: Promote habitat connectivity and increase ecosystem redundancy
- 4.2: Maintain or create fire refugia
- 4.3: Stabilize and enhance the physical fire footprint
- 4.4: Promote recovery of native vegetation and habitat

5: Maintain and enhance structural and species diversity using fire and fuels treatments – Resilience

- 5.1: Maintain or increase structural diversity from stand to landscape scale
- 5.2: Promote diversity within and among communities to enhance fire resilience

Primary Approaches

▶ Adaptation

▶ Mitigation

Primary Approaches

▶ Mitigation

- ▶ R3 microgrants program
- ▶ Greening Fire Team
- ▶ Carbon Partnership Program
- ▶ Carbon Assessments
- ▶ Orphaned wells / ultra emitters

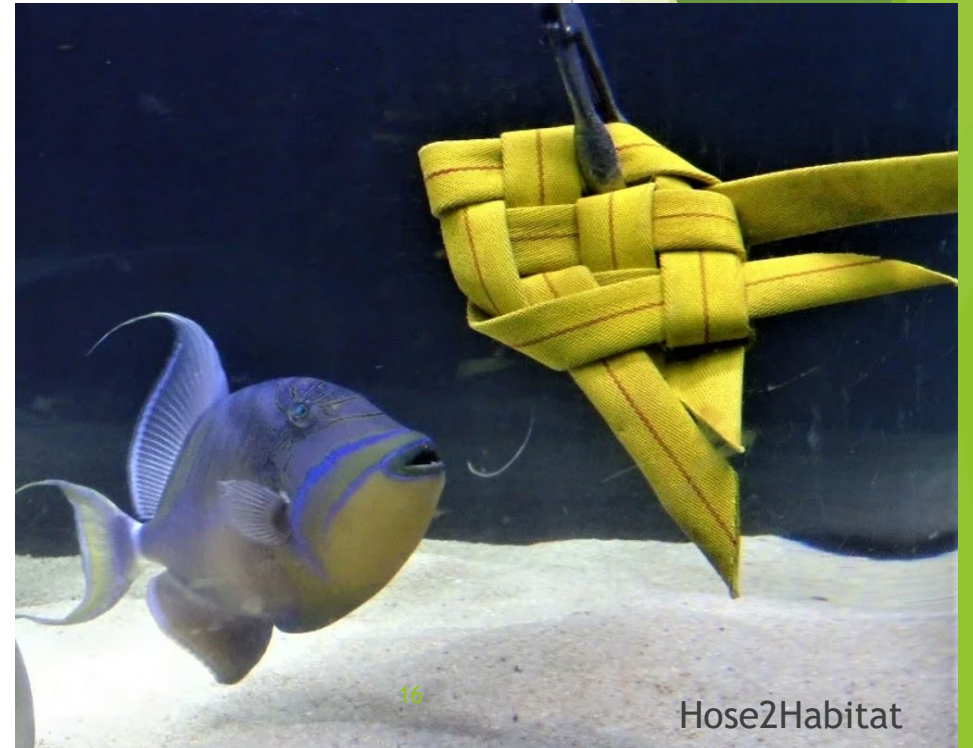
Greening Fire Team



Solar panels being used by the Lolo Interagency Hotshots (Missoula, MT) to recharge radio batteries.

The portable power source keeps the crew from having to dispose of ~80 AA disposable batteries daily (~8,800/yr).

- ▶ Re-chargeable batteries + solar panels for handheld radios
- ▶ Fire hose diverted from landfill → much of it goes to zoos for animal enrichment!
- ▶ Solar powered chainsaws



The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, leaving a large white central area. The shapes are layered, creating a sense of depth and movement.

Questions?

Resources

- ▶ Tackling the Climate Crisis EO: <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>
- ▶ USDA Climate-Smart Agriculture and Forestry Strategy May 2021: <https://www.usda.gov/sites/default/files/documents/climate-smart-ag-forestry-strategy-90-day-progress-report.pdf>
- ▶ Federal Climate Adaptation Plans: <https://www.sustainability.gov/adaptation/>
- ▶ Forest Service Climate Adaptation Plan: https://www.usda.gov/sites/default/files/documents/4_NRE_FS_ClimateAdaptationPlan_2022.pdf
- ▶ Forest Service Wildfire Strategy: <https://www.fs.usda.gov/managing-land/wildfire-crisis>
- ▶ Tools & Data related to climate change: <https://www.fs.usda.gov/managing-land/sc/data-dashboard>
- ▶ Climate Change Resource Center: <https://www.fs.usda.gov/ccrc/>
- ▶ Greening Fire Team: <https://www.fs.usda.gov/managing-land/fire/sustainable-ops>
- ▶ Socioeconomic Vulnerability to Ecological Changes in the Southwest An All Lands Assessment (SEVA): https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd969262.pdf