



Forest Service
U.S. DEPARTMENT OF AGRICULTURE



Bureau of Land Management
U.S. DEPARTMENT OF THE INTERIOR

Mature and Old Growth Inventory and Threats Analysis

Pinyon-Juniper Workshop

Aaron Kamoske, PhD

Ecological Analyst, USDA Forest Service

May 8, 2024

Executive Order 14072: An Overview

‘Strengthening the Nation’s Forests, Communities, and Local Economies’

- Released on Earth Day 2022
- Section 2 (b):
 - *‘...within 1 year of the date of this order, define, identify, and complete an inventory of old-growth and mature forests on Federal lands...’*
- Section 2 (c):
 - *‘...analyze the threats to mature and old-growth forest on Federal lands...’*
 - *‘...develop policies...’* by early 2025.

Executive Order 14072: An Overview

The objective:

- **Develop a mature and old growth definition framework** that considers the important values provided by old forest conditions, recognizes existing and evolved definitions to provide an improved picture for land managers to guide sound, science-informed, decision making.



The oldest known western juniper, near 1,650 years, in central Oregon ([Photo by Rick Miller, Oregon State University](#)).

Inventory

Executive Order 14072: An Overview

‘Strengthening the Nation’s Forests, Communities, and Local Economies’

- Initial mature and old growth inventory first released April 2023. Updated report released May 3, 2024.
- Introductory threat analysis published January 2024. The full report is expected to be released this summer.
- National proposed old growth amendment draft environmental impact statement expected in early summer 2024
- Develop a framework for plan level monitoring of old growth forest conditions based on national level data



USDA Forest Service U.S. DEPARTMENT OF AGRICULTURE
April 2023 | FS-1215a

Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management

Fulfillment of Executive Order 14072, Section 2(b)

Old-growth ponderosa pine forest stand on the Fremont-Winema National Forest in Oregon. USDA Forest Service photo.



USDA Forest Service U.S. DEPARTMENT OF AGRICULTURE Bureau of Land Management U.S. DEPARTMENT OF THE INTERIOR
FS-1242a January 2024

Introductory Report

Analysis of Threats to Mature and Old-Growth Forests on Lands Managed by the Forest Service and Bureau of Land Management

Fulfillment of Executive Order 14072, Section 2.c.ii

Overview
Executive Order (EO) 14072—Strengthening the Nation's Forests, Communities, and Local Economies—instructed the U.S. Department of the Interior, Bureau of Land Management (BLM) and U.S. Department of Agriculture (USDA), Forest Service to implement a set of actions focused on the health of the Nation's forests. Section 2.c.ii directed the agencies to analyze the threats to mature and old-growth forests on Federal lands, including from wildfires and climate change. To fulfill this direction, the agencies are creating a full report that will be available in early 2024. This introductory report summarizes initial key findings.

As recognized in section 1 of EO 14072, old-growth forests have decreased significantly from what existed historically. Understanding what threatens mature and old-growth forests is imperative to conserving and managing these forests and protecting their ecological, social, cultural, and economic value.

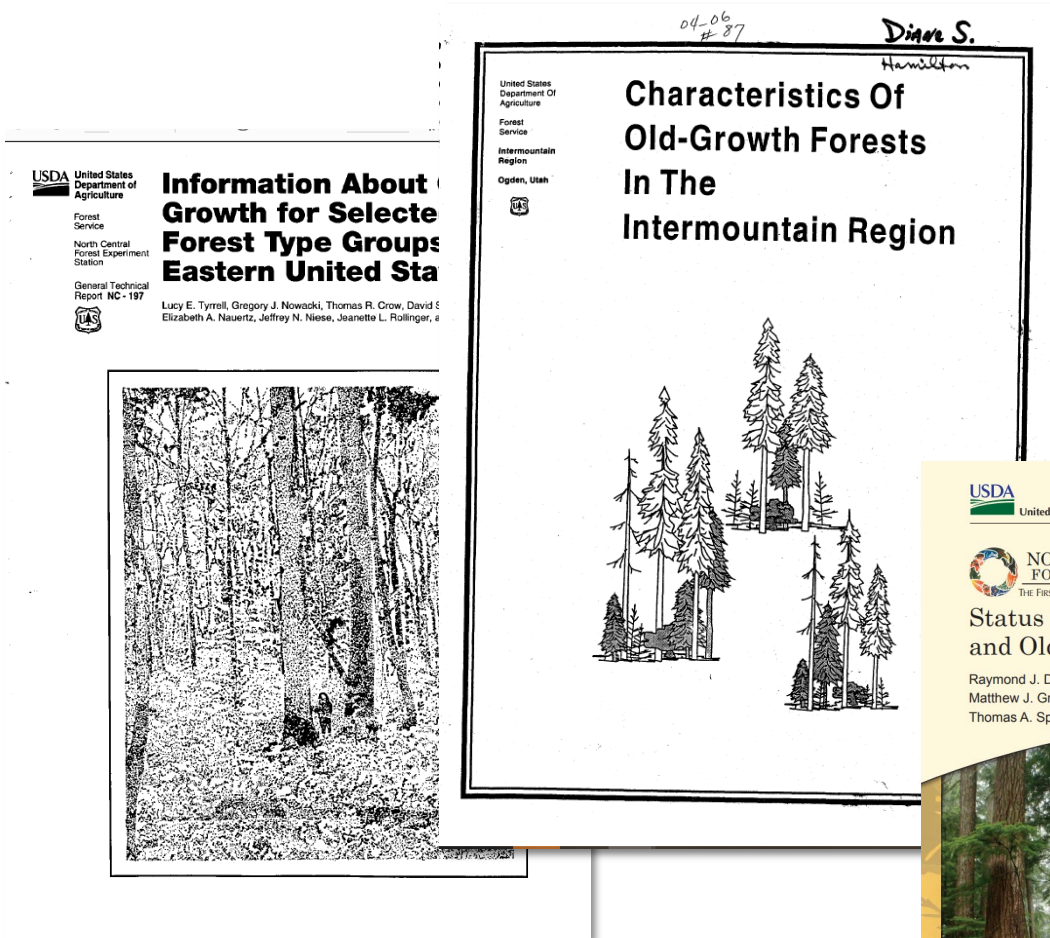
What Constitutes a Threat?
For this analysis, shaped by technical experts and feedback from the public, a threat is defined as a current or projected disturbance or stressor that may contribute to the enduring loss or degradation of the characteristic conditions, functions, or values of existing

Defining Mature and Old Growth
According to the Mature Forest Narrative Framework, mature forests are delineated ecologically as the stage of forest development immediately before old growth. The mature stage of stand development generally begins when a forest stand moves beyond self-thinning, starts to diversify in height and structure, and/or the understory begins to reinitiate. Structural characteristics that mark the transition from an immature to mature forest are unique to each forest type; they may include but are not limited to: abundance of large trees, large tree stem diameter, stem diameter diversity, horizontal canopy openings or patchiness, aboveground biomass accumulation, stand height, presence of standing and/or downed boles, vertical canopy layers, or a combination of these attributes.

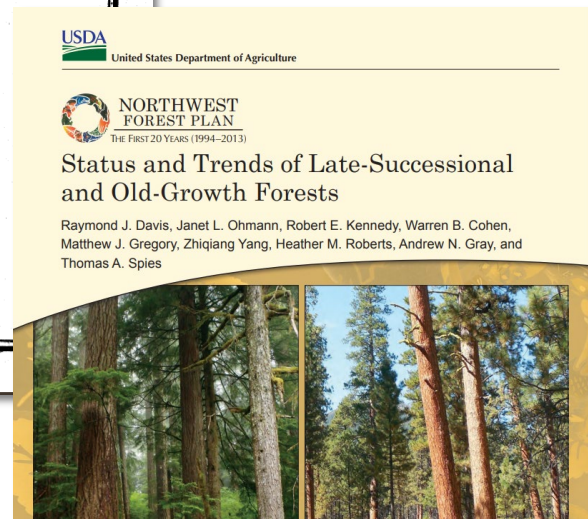
Mature and old-growth forests come in all shapes and sizes and can often be abundant. Mature and old-growth forests offer biological diversity, carbon sequestration, wildlife and fisheries habitat, recreation, aesthetics, soil productivity, and clean water. These special forests also reflect diverse Tribal, social, and cultural values.

Key Findings
The initial threat analysis found that mature and old-growth forests have high exposure to a variety of

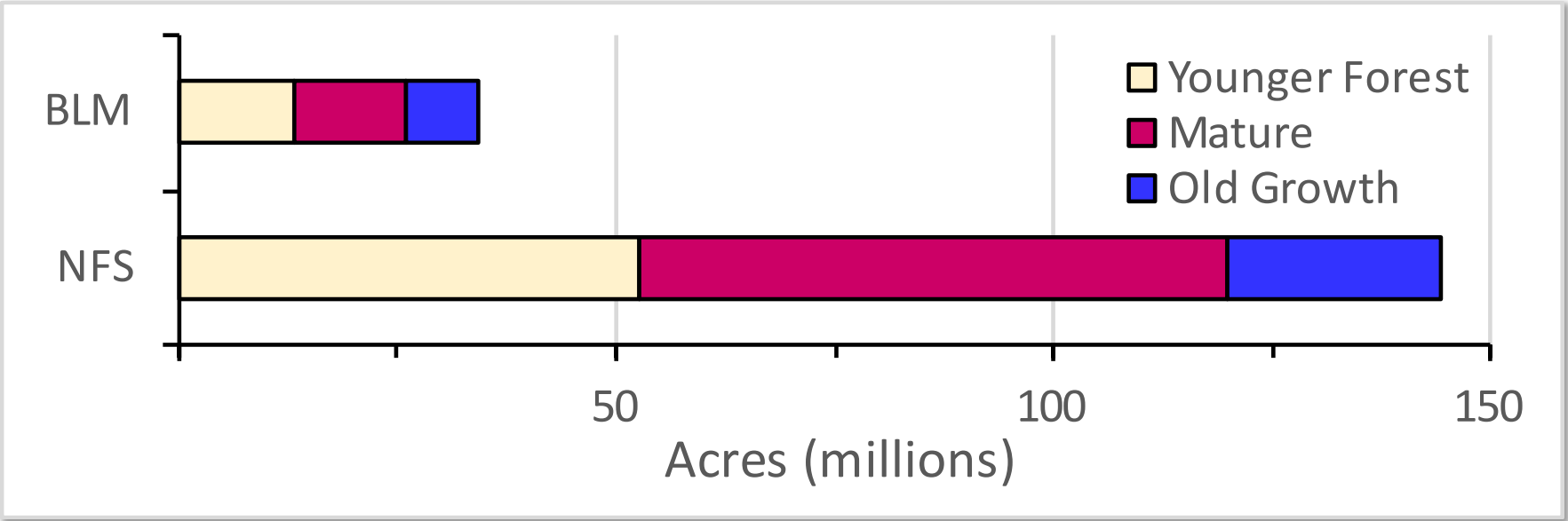
Inventory Overview



- Estimation of mature and old growth on Forest Service and BLM managed land at the national scale
 - Existing old-growth forest definitions for each Forest Service region
 - Existing Forest Inventory Analysis data
- Forest Inventory and Analysis a congressionally mandated program that delivers current, consistent, and credible information about the status and trends of forests and forest resources in the United States



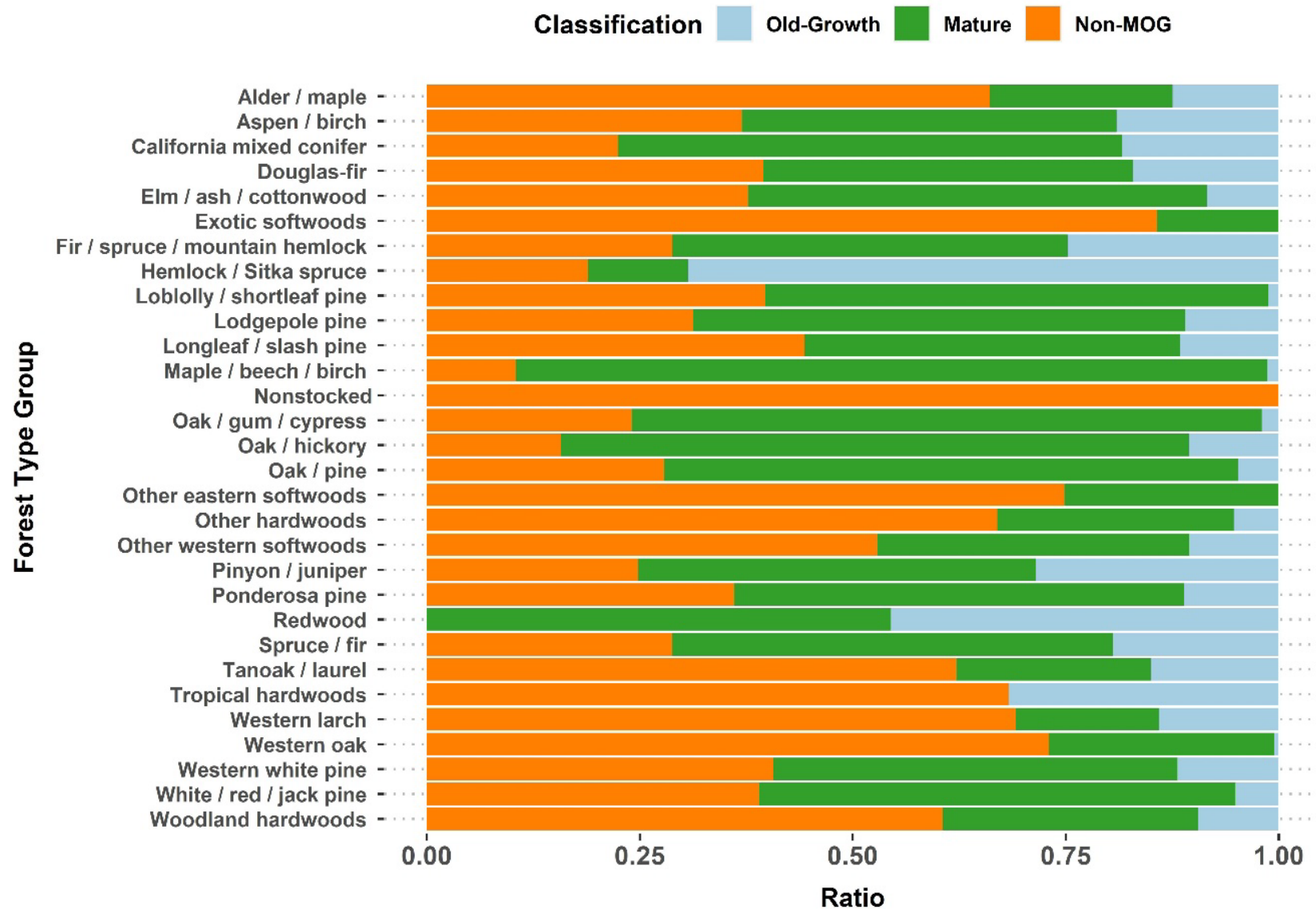
Inventory Overview



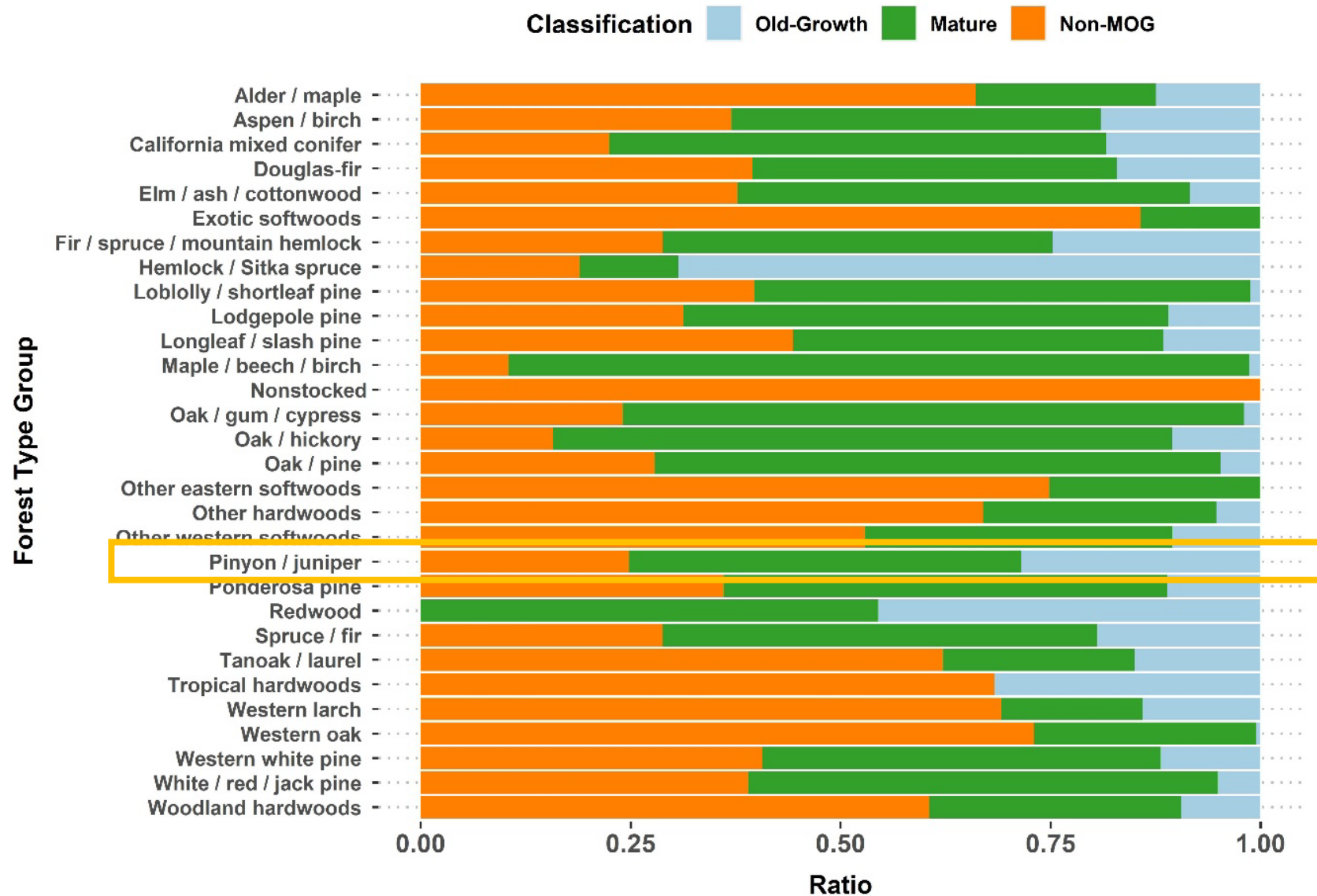
Forest land acres
(% of total
forested land
within mature and
old-growth
forest categories)

	BLM	NFS	Total
Old Growth	8,258,000 (24%)	24,400,000 (17%)	32,658,000 (18%)
Mature	12,699,000 (37%)	67,413,000 (47%)	80,112,000 (45%)

Inventory Overview



Inventory Overview



Examples of PJ Conditions



*Single leaf pinyon from
the north end of the
White Mountains,
California; [by Rick Miller.](#)*

Examples of PJ Conditions



Pinyon and juniper woodlands in Schell Creek Mountains, Nevada; [by Rick Miller.](#)

Examples of PJ Conditions



*Western juniper
woodland in Horse
Ridge, Oregon; [by Rick
Miller.](#)*

Examples of PJ Conditions



Utah juniper in the Southwest corner of Utah; [by Rick Miller.](#)

Examples of PJ Conditions



*Sierra juniper rooted in the
High Sierras at 8,500'. [Photo](#)
[by Rick Miller OSU](#)*

Pinyon-Juniper: Old Growth Structural Criteria

Pinyon-juniper forests cover diverse settings across the Western United States, with 14 distinct old-growth working definitions for this forest type group.

Region	Vegetation Type	Large Tree Age	Large Tree Diameter (in)	Number of Large Trees per Acre	Number of Trees with Cull of Broken/Dead Top per Acre	Number of Dead Trees per Acre	Minimum % SDI from Trees $\geq 18"$ DIA	Minimum QMD of Trees $\geq 10"$ DIA
2	<i>Pinyon-juniper</i>	200	12	30	1	1	NA	NA
3	<i>PJ Evergreen Shrub</i>	NA	NA	NA	NA	NA	NA	18
	<i>PJ Woodland (persistent)</i>	NA	NA	NA	NA	NA	NA	18
	<i>PJ Sagebrush</i>	NA	NA	NA	NA	NA	NA	18
	<i>PJ Deciduous Shrub</i>	NA	NA	NA	NA	NA	NA	18
	<i>PJ Grass</i>	NA	NA	NA	NA	NA	29	NA
	<i>Juniper Grass</i>	NA	NA	NA	NA	NA	36	NA
4	<i>Madrean Pinyon-Oak</i>	NA	NA	NA	NA	NA	20	NA
	<i>Pinyon-juniper NW low</i>	200	12	12	NA	NA	NA	NA
	<i>Pinyon-juniper NW high</i>	250	18	30	NA	NA	NA	NA
	<i>Pinyon-juniper SE low</i>	150	9	12	NA	NA	NA	NA
5	<i>Pinyon-juniper SE high</i>	200	12	30	NA	NA	NA	NA
	<i>Mixed Subalpine (Western Juniper Association)</i>	200	30	5	NA	NA	NA	NA
6	<i>Juniper (NWFP)</i>	NA	19.7	6	NA	NA	NA	NA

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Pinyon-Juniper: All Forest Service and BLM Lands



Rocky mountain juniper, east slope of the Rocky Mountains, Colorado; [by Rick Miller.](#)

- **Pinyon-juniper forest** occurs on more than **35 million acres** of lands managed by the Forest Service and BLM, with over **9 million acres of old growth** and **14 million acres of mature forest**.

Pinyon-Juniper Distribution

PINYON-JUNIPER ON NFS & BLM LANDS					
ALL NFS & BLM LANDS			37.99 MM		
PASSIVE MANAGEMENT			9.70 MM		
ACTIVE MANAGEMENT			28.29 MM		
PINYON-JUNIPER ON ACTIVE MANAGEMENT LAND ALLOCATIONS WITH SLOPES LESS THAN OR EQUAL THAN 40%		PINYON-JUNIPER ON ACTIVE MANAGEMENT LAND ALLOCATIONS WITH SLOPES GREATER THAN 40% AND LESS THAN 70%		PINYON-JUNIPER ON ACTIVE MANAGEMENT LAND ALLOCATIONS WITH SLOPES GREATER THAN OR EQUAL TO 70%	
Distance to Roads	Acres	Distance to Roads	Acres	Distance to Roads	Acres
less than 1/2 mile	8.49 MM	less than 1/2 mile	1.35 MM	less than 1/2 mile	0.19 MM
1/2 mile to 1 mile	4.52 MM	1/2 mile to 1 mile	1.00 MM	1/2 mile to 1 mile	0.12 MM
greater than 1 mile	9.95 MM	greater than 1 mile	2.39 MM	greater than 1 mile	0.27 MM
Total	22.96 MM	Total	4.74 MM	Total	0.58 MM

- On **Forest Service and BLM** managed lands there is estimated to be more than **35 million acres of pinyon-juniper**, of which **25% is in passive management** land allocations (e.g., Wilderness, Roadless) and **75% is in active management** land allocations.
- Old growth pinyon-juniper** accounts for nearly **25% of the pinyon-juniper on Forest Service and BLM lands**, with over **25% being in passive management** land allocations.

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Threat Analysis

Introductory Threat Report



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Bureau of Land Management
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FS-1242a | January 2024



Introductory Report

Analysis of Threats to Mature and Old-Growth Forests on Lands Managed by the Forest Service and Bureau of Land Management

Fulfillment of Executive Order 14072, Section 2.c.ii

Overview

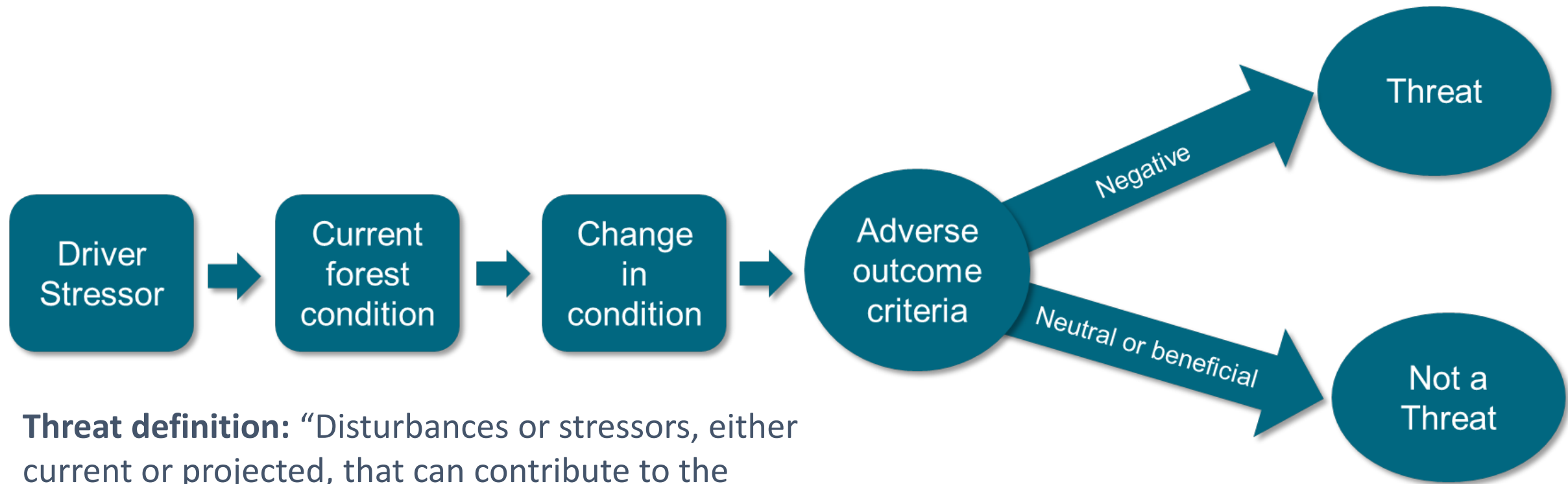
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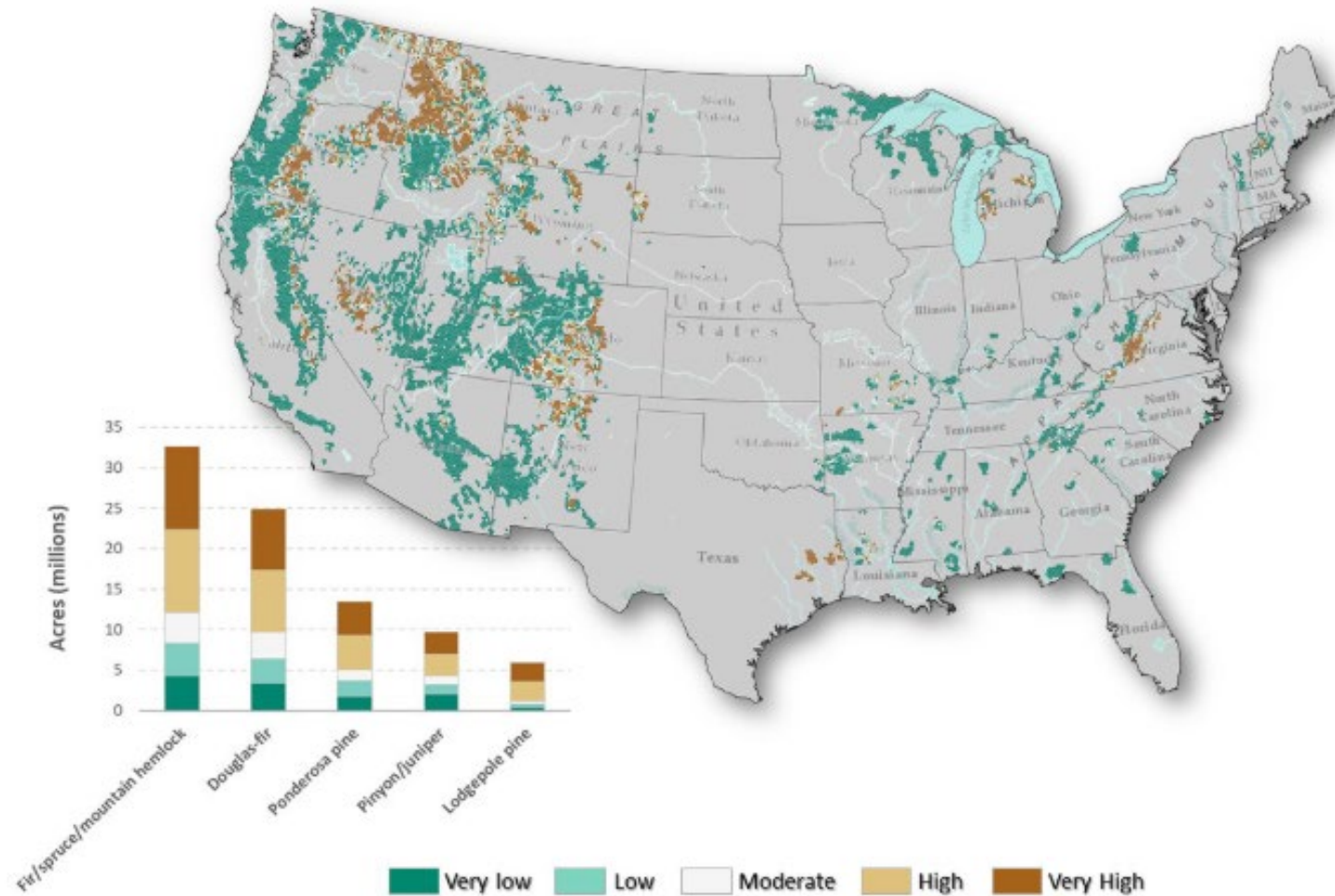
Introductory Report is available online, with full report to be released this summer.

Threat Analysis Initial Findings



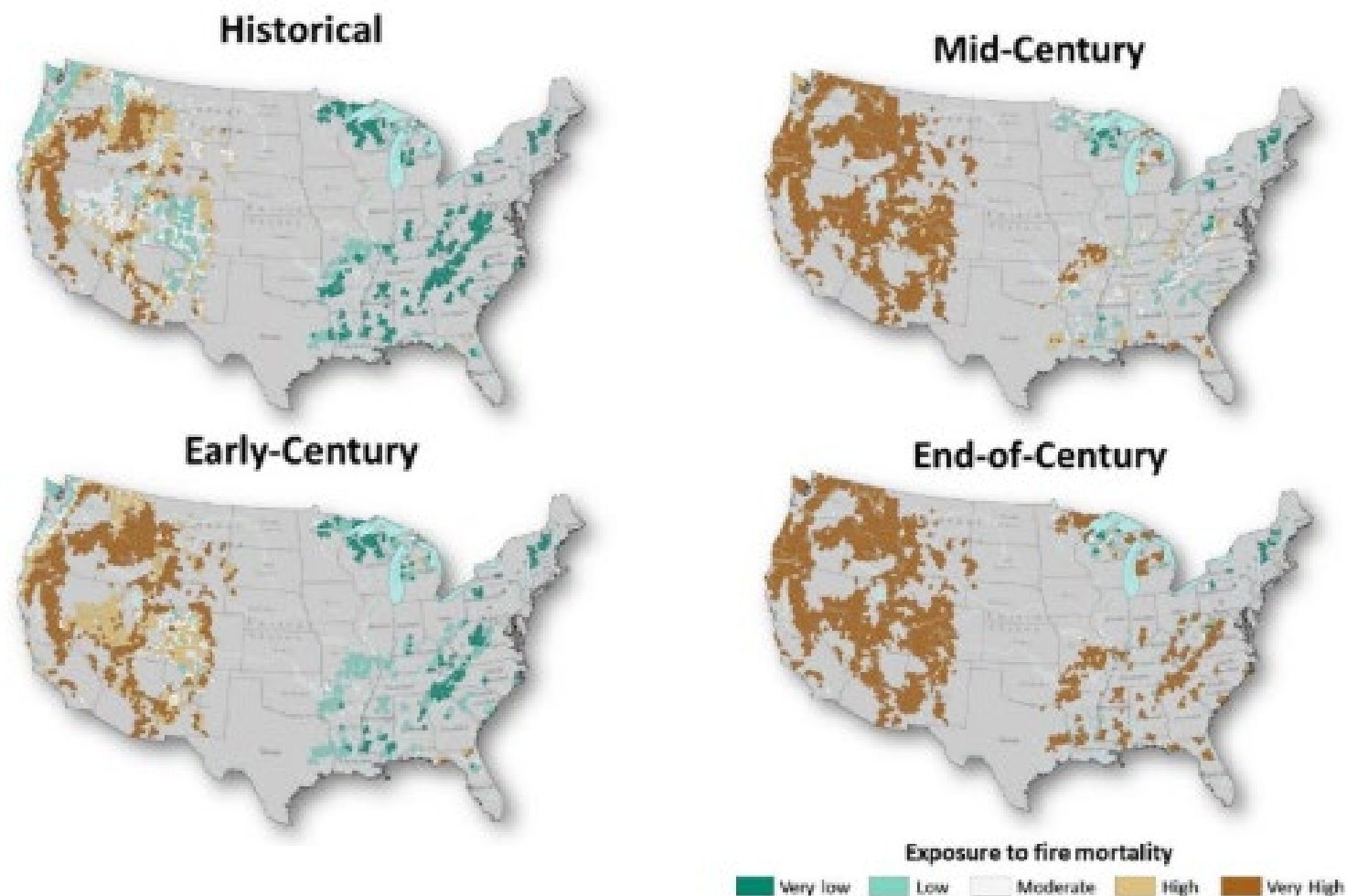
Threat definition: “Disturbances or stressors, either current or projected, that can contribute to the enduring loss or degradation of the characteristic conditions, functions, or values of existing mature and old-growth forests.”

Threat Analysis Initial Findings

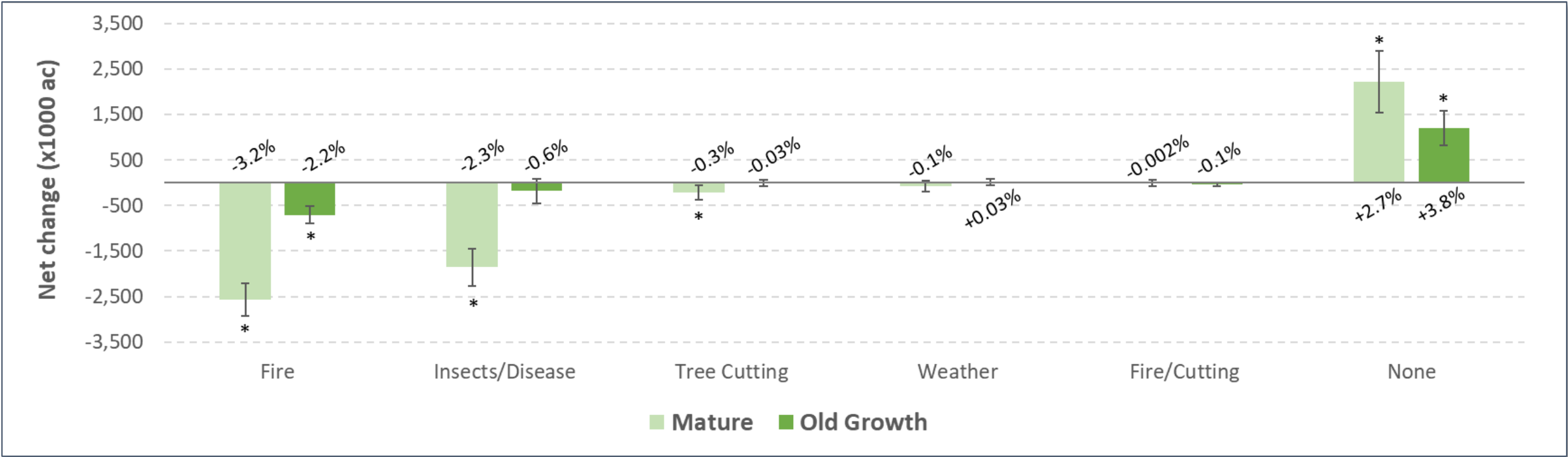


Fireshed registry project area map (about 25,000 acres each) of current risk to forests from insects and disease. Bar chart highlights the top five forest type groups from largest area of mature and old growth to lowest with high exposure.

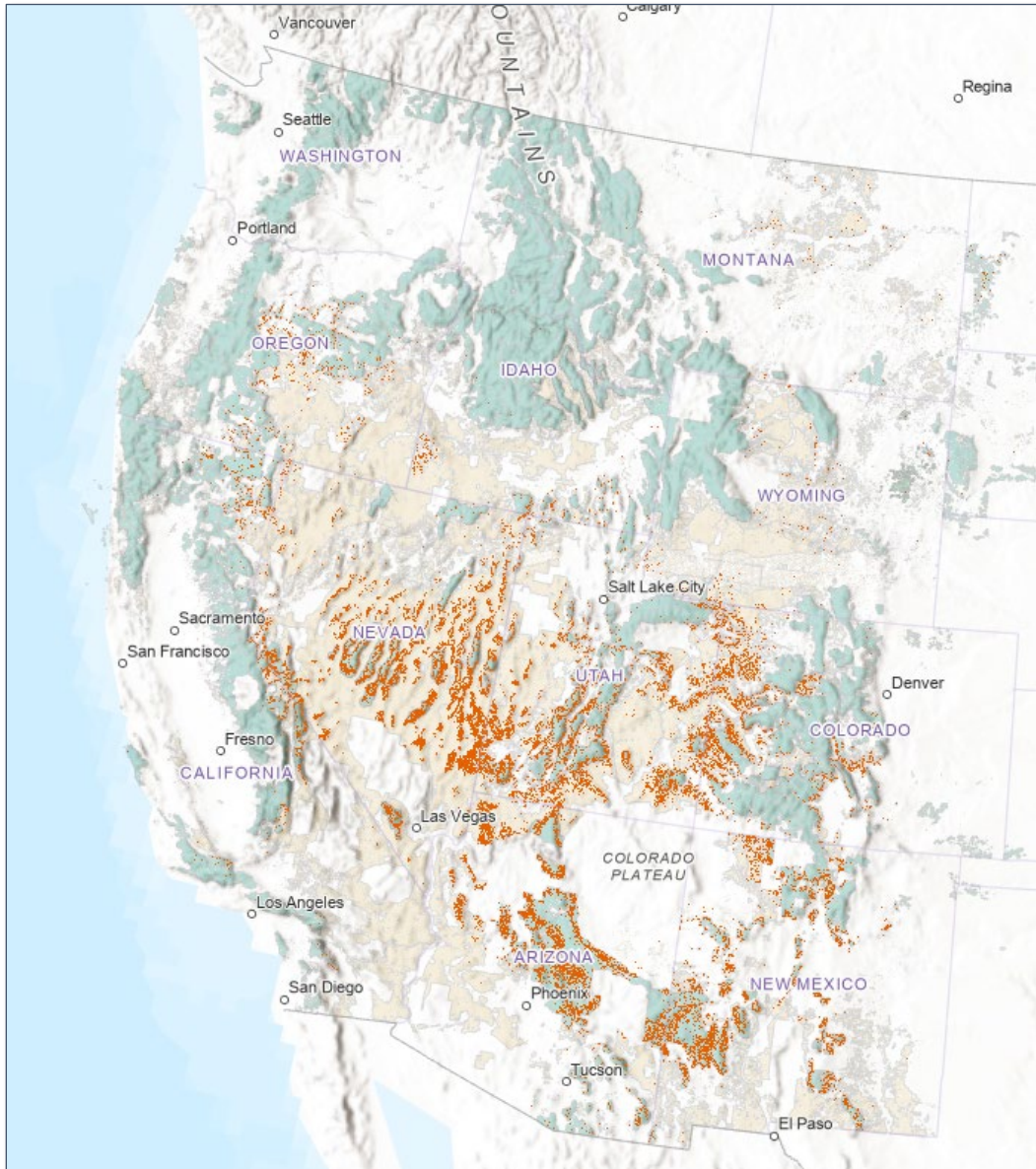
Threat Analysis Initial Findings



Threat Analysis Initial Findings

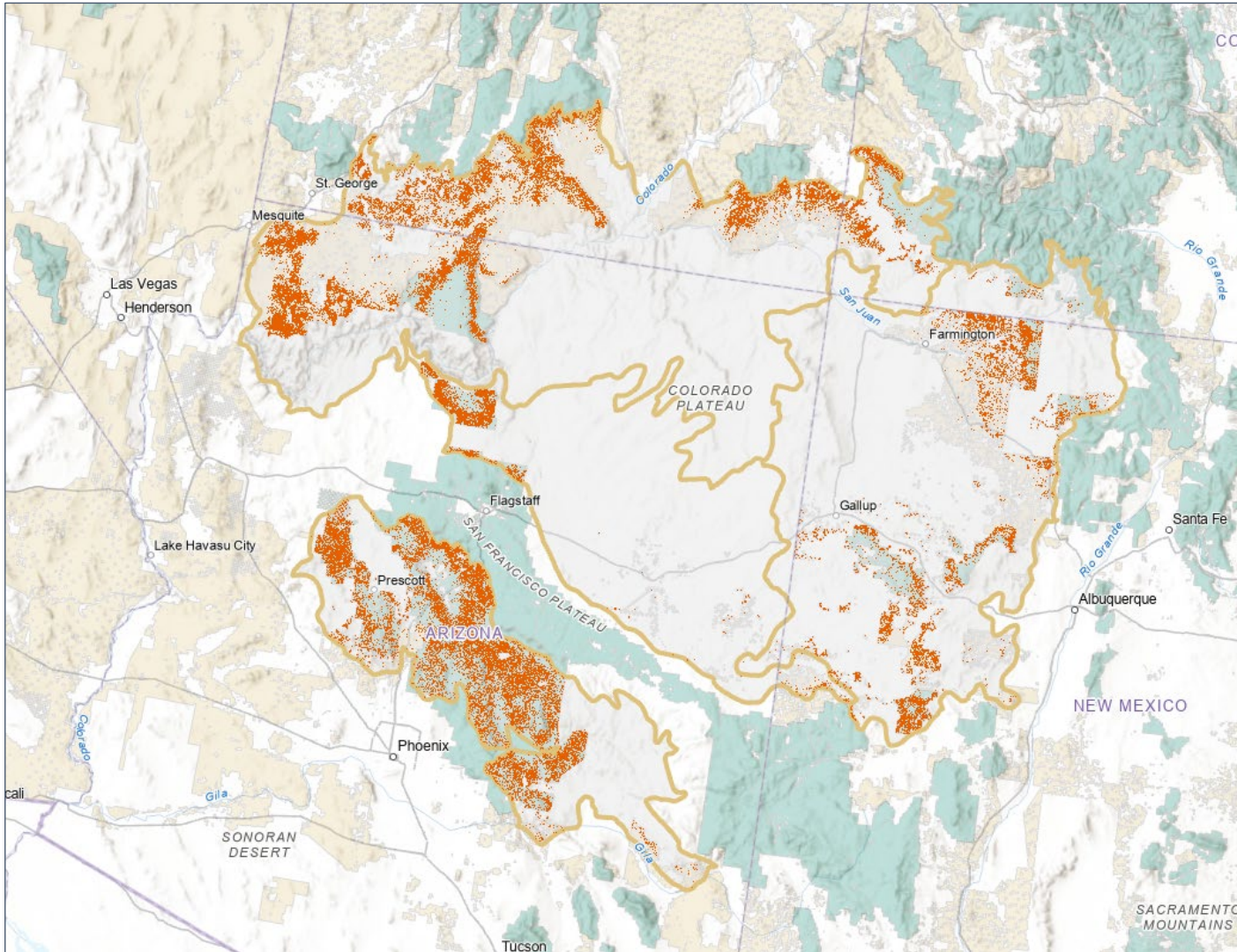


Pinyon-Juniper: All Forest Service and BLM Managed Lands



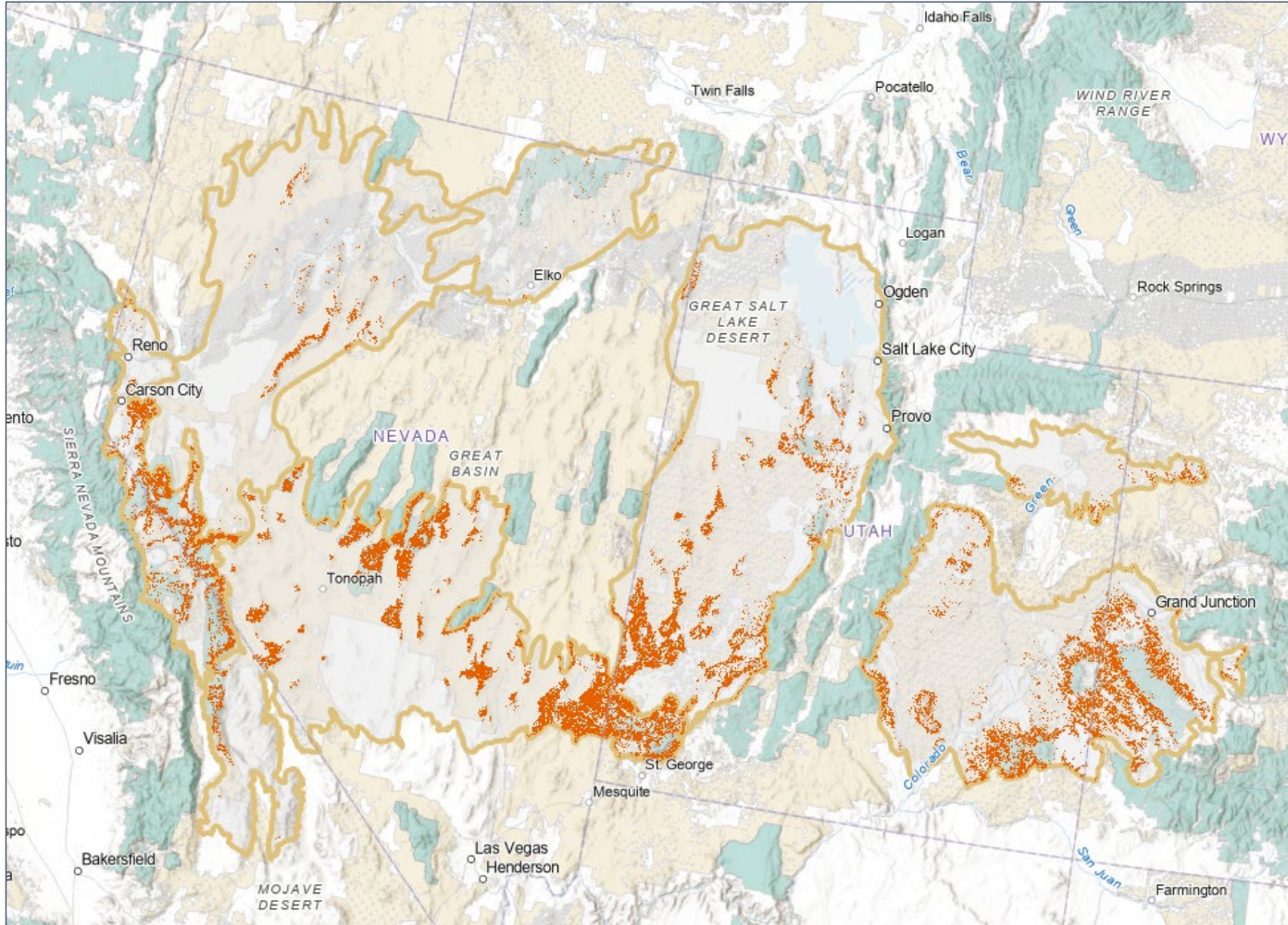
- Over 35 million acres of pinyon-juniper in across all Forest Service and BLM managed lands, of which about 25% is old growth.
- In a 10-year period between 2000 and 2020 **all pinyon-juniper** experienced the following:
 - < 1% experienced tree cutting
 - 2% experienced fire
 - 6% experienced insects and disease
- In a 10-year period between 2000 and 2020 **old-growth pinyon-juniper** experienced the following:
 - < 1% experienced tree cutting
 - 2% experienced fire
 - 6% experienced insects and disease

Pinyon-Juniper: Forest Service and BLM Managed Lands in Colorado Plateau Semi-Desert Province



- Over 5.5 million acres of pinyon-juniper in this ecological province, of which about **40% is old growth**.
- In a 10-year period between 2000 and 2020 **all pinyon-juniper** experienced the following:
 - 1% experienced tree cutting
 - 2% experienced fire
 - 5% experienced insects and disease

Pinyon-Juniper: Forest Service and BLM Managed Lands in Intermountain Semi-Desert and Desert Province



- Over 7.5 million acres of pinyon-juniper in this ecological province, of which about **35% is old growth**.
- In a 10-year period between 2000 and 2020 **all pinyon-juniper** experienced the following :
 - < 1% experienced tree cutting
 - 3% experienced fire
 - 10% experienced insects and disease

Closing Thoughts

EO 14072: Next Steps



Old-growth trees on Modoc Plateau, northern California. [Photo by Rick Miller OSU](#)

- Public comment opportunity on pinyon-juniper ecosystems through May 20
- Remain engaged with Tribes and Alaska Native Corporations
 - Braiding Indigenous Knowledge, Western Science, Mature and Old-Growth Forest Definitions, and Climate Change
 - https://depts.washington.edu/flame/mature_forests/pdfs/BraidingSweetgrassReport.pdf
- Publish the full threat analysis report
- Develop framework for network and plan-level monitoring

Closing Thoughts



Pinyon pine in Great Basin National Park, Nevada. [Photo by Rick Miller OSU](#)

- HUGE thanks to the entire old growth inventory and threat analysis technical teams!
- **Please reach out with any questions or if you are interested in collaborating!**
- Aaron Kamoske, PhD
 - Ecological Analyst, USDA Forest Service
 - Aaron.Kamoske@usda.gov



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