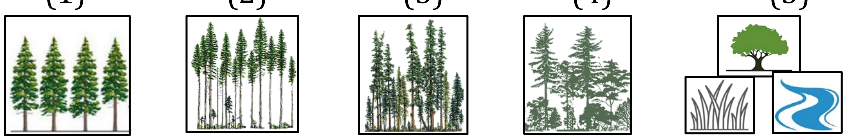
McDonald-Dunn Research Forest Planning
Request for Input on Alternative Land Allocation Scenarios
Community Input Session – 28 Oct 2024

Background:

1. The McDonald-Dunn Research Forest provides students, researchers, and the community extensive opportunities to learn about all aspects of forest management, while also providing social and cultural benefits to a variety of users. For nearly 2.5 years, work has been ongoing to develop a new plan that will guide the forest for years to come. Currently, we're requesting input on the allocation of various forest management strategies across the forest landscape.

2. The 5 'forest management strategies' that will be implemented across the forest to enable teaching, research, and demonstration opportunities are: (1) even-aged short rotation, (2) even-aged long rotation, (3) multi-aged, multi-species, (4) managed reserves, and (5) ecosystems of concern – which includes oak savanna, meadows, and riparian. A summary of the management strategies can be found online here, with brief summaries on pages 6-7.

(1) (2) (3) (4) (5)



3. We're using a modeling process to assist in making decisions on the timing and location of forest management activities. This modeling assigns management activities to each forest stand and then simulates the resulting future forest conditions. The intent is to enable an assessment of trade-offs among land allocation options before one option is selected and implemented.

4. Keeping in mind the vision, mission, and goals of the Research Forests (described on page 2), as well as input received from the *Stakeholder Advisory Committee* and 2022 *Community Listening Sessions*, we developed 8 measures to be used to assess tradeoffs among land allocation scenarios. These measures reflect a variety of interests, and include **biodiversity**, **forest carbon**, **forest products**, **recreation acceptability**, **resilience (density)**, **resilience (composition)**, **net revenue**, and **wildfire resistance** (described on pages 8-9).

5. In June 2024, we used initial model results to assess tradeoffs among 5 initial scenarios. Using input received from the *Faculty Planning Committee*, *Stakeholder Advisory Committee*, and June 2024 *Community Input Session*, we revised the input and re-ran the model to improve accuracy during September. The *Faculty Planning Committee* and *Stakeholder Advisory Committee* then developed 7 new scenarios that were modeled in October. All scenarios are described on page 3 and modeling results on pages 4 and 5.

6. At the present time we are seeking input on (1) **which scenario(s) you consider most preferable for the research forest and why**, and (2) **which scenario(s) you consider least preferable for the research forest and why**. We appreciate your input.

Research Forests
Vision, Mission, and Goals

Oregon State University and the College of Forestry are stewards of nine separate tracts of land around the state. This document articulates the collective vision, mission, and goals for the College of Forestry's Research Forests. It reflects how we value our forests, and the benefits we wish to derive from them, now and in the future. Just as college and unit strategic plans are reflections of OSU's strategic priorities, individual forest management and tactical plans will strive to meet the goals in this document to ensure the Research Forests achieve their vision and mission.

Vision:

The OSU Research Forests aspire to be globally recognized as a model for an actively and sustainably managed forest system that supports the College's desire to advance forestry through scientific inquiry, education, and the application of new knowledge to inform best practices of forest management.

Mission:

- To create opportunities for education, research, and outreach to address the economic, social, and environmental values of current and future generations of Oregonians and beyond.
- To demonstrate how an actively and sustainably managed forest fosters economic prosperity, biodiversity conservation, and resilience amidst disturbances and global change.
- To support social and cultural values of forests, enhancing the wellbeing of local communities, Tribal communities, and our broader citizenship.

Goals:

Learning, Discovery, Engagement - Provide students, teachers, researchers and the general public diverse opportunities for learning, discovery, and engagement related to forest ecosystems and management for multiple resource values.

Stewardship - Demonstrate sound forest stewardship principles that address the challenge of balancing the need for productive forests, diverse plant and wildlife communities, healthy aquatic ecosystems, carbon storage potential, recreation opportunities, and other resource values.

Research - Provide long- and short-term opportunities for student and faculty research, citizen science, and the sharing of research findings.

Resilient Forests - Promote resilience to the effects of a changing climate, invasive species, insect pests, pathogens, wildfire, urban encroachment, and other disturbances.

Working Demonstration Forest - Demonstrate contemporary and innovative aspects of an active and sustainably managed forest, based on the best available science and technology.

Recreation - Provide safe, diverse, and inclusive recreation opportunities that build forest connections and contribute to community well-being.

Community Connections - Establish, maintain, and enhance relationships and communication with neighbors, the broader community, and all those connected with the Research Forests.

Financial Sustainability - Provide revenue that sustains Research Forest operations and supports the College of Forestry's education, research, and outreach mission now and in the future.

Accountability - Demonstrate a commitment to transparent governance of OSU's Research Forest properties focused on achieving the stated vision, mission, and goals.

Continuous Improvement - Demonstrate a commitment to continuous improvement in the management and stewardship of the Research Forests based on adaptive management principles.

McDonald-Dunn Research Forest Scenarios Modeled to Assess Tradeoffs

Table 1. Five initial scenarios investigated in round 1 (in late May) and revisited in round 1v2 (in September).

Management Strategies	Scenario A (baseline)	Scenario B (high EASR)	Scenario C (high EALR)	Scenario D (high MAMS)	Scenario E (high MR & EOC)
Even-aged, short rotation (EASR)	25%	39%	15%	10%	15%
Even-aged, long rotation (EALR)	27%	15%	39%	10%	15%
Multi-aged/multi-species (MAMS)	20%	10%	10%	39%	15%
Managed reserve (MR)	4%	10%	10%	15%	19%
Ecosystems of concern (EOC)	6%	10%	10%	10%	19%
Long term learning & non-forest	17%	17%	17%	17%	17%
TOTAL	100%	100%	100%	100%	100%

Table 2. Seven new scenarios investigated in Round 2 (in October).

Management Strategies	Scenario K (high EALR)	Scenario M (high EALR & MAMS, low EASR)	Scenario G (high EALR & MAMS, modest EASR)	Scenario N (equal EALR & MAMS, high EOC)	Scenario H (equal EALR & MAMS, high MR)	Scenario L (high MAMS & EALR, equal else)	Scenario J (high MAMS)
Even-aged, short rotation	8%	5%	14%	9%	10%	10%	8%
Even-aged, long rotation	50%	35%	35%	25%	24%	20%	8%
Multi-aged/multi-species	8%	25%	20%	26%	24%	33%	50%
Managed reserve	8%	9%	8%	8%	15%	10%	8%
Ecosystems of concern	8%	9%	6%	14%	10%	10%	8%
Long term learning & non-forest	17%	17%	17%	17%	17%	17%	17%
TOTAL	100%	100%	100%	100%	100%	100%	100%

Data for assessing tradeoffs among land allocation scenarios through relative comparisons with baseline

[ordered left to right along a continuum from high to low percentage of even-aged long rotation; red font indicates a reduction compared to the baseline]

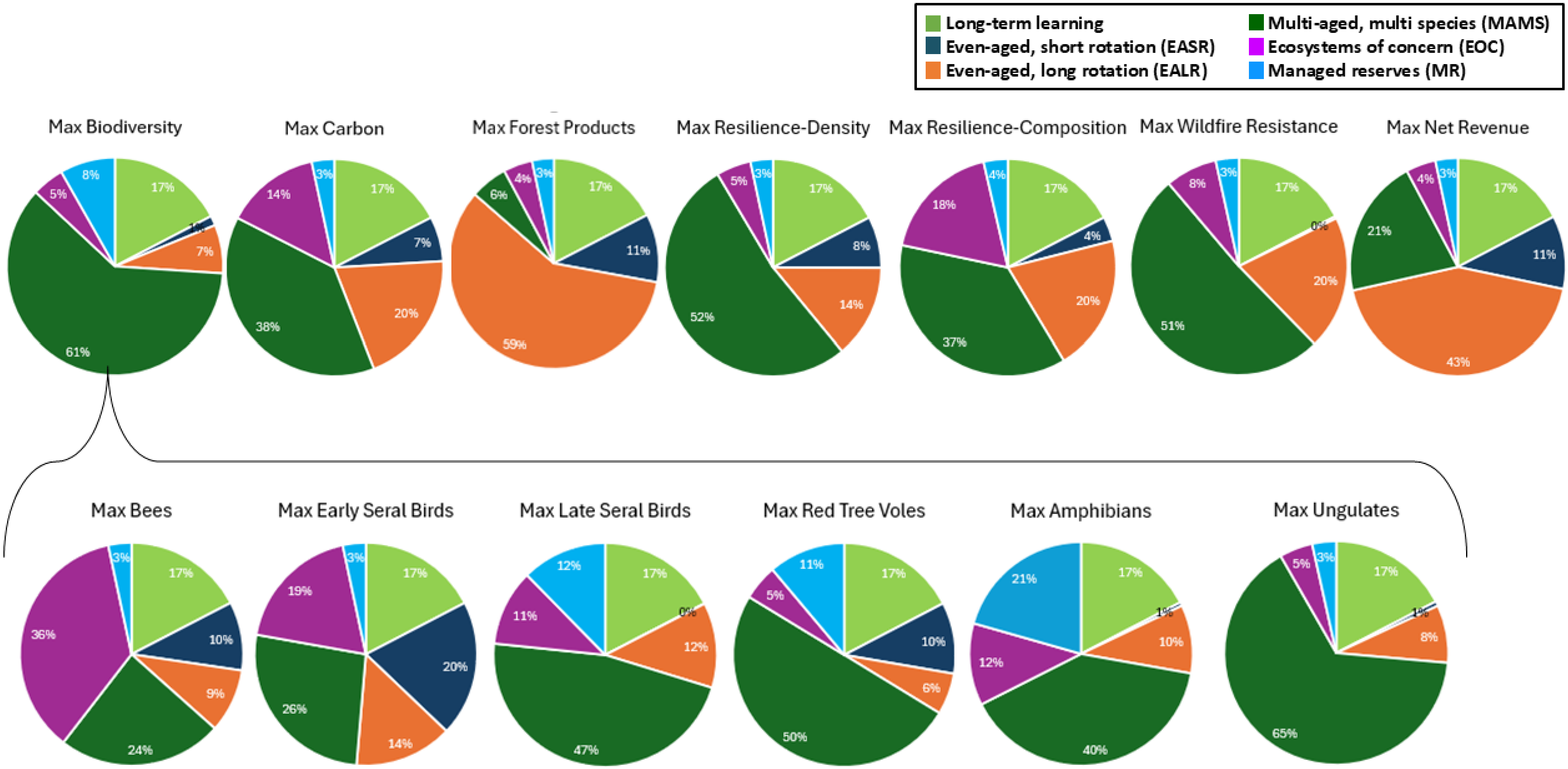
Forest Value	Scenario A	Scenario K	Scenario C	Scenario M	Scenario G	Scenario N	Scenario H	Scenario L	Scenario E	Scenario B	Scenario D	Scenario J
Biodiversity (avg across all taxa)	1.80	1.78	1.83	1.96	1.87	1.98	2.01	2.03	2.01	1.86	2.13	2.13
Forest carbon (in Tons)	770,133	836,376	885,224	915,267	839,433	964,565	1,004,417	961,854	1,117,992	946,926	1,039,536	962,094
Forest products (MMBF per year)	5.5	5.5	5.1	5.1	5.4	4.8	4.5	4.7	3.8	4.1	4.2	4.7
Direct/indirect jobs sustained (per year)	~62 jobs	~62 jobs	~58 jobs	~58 jobs	~61 jobs	~55 jobs	~50 jobs	~53 jobs	~43 jobs	~46 jobs	~48 jobs	~53 jobs
Net revenue (per year)	$1.0M	$966K	$812K	$896K	$966K	$780K	$627K	$757K	$307K	$426K	$550K	$779K
Recreation acceptability	3.42	3.47	3.48	3.44	3.47	3.44	3.55	3.52	3.60	3.44	3.58	3.55
Resilience - density	2.87	2.64	2.59	2.73	2.79	2.61	2.56	2.74	2.21	2.46	2.68	2.94
Resilience - composition	2.58	2.56	2.54	2.49	2.51	2.59	2.57	2.58	2.66	2.71	2.65	2.62
Wildfire resistance	2.43	2.43	2.43	2.50	2.47	2.50	2.49	2.54	2.44	2.42	2.57	2.62

Bee component of biodiversity	0.76	0.76	0.80	0.76	0.75	0.84	0.77	0.79	0.87	0.79	0.77	0.76
early seral birds	1.16	1.08	1.09	1.04	1.10	1.01	1.00	1.02	0.95	1.11	0.99	1.03
late seral birds	2.42	2.38	2.49	2.87	2.60	2.96	3.02	3.07	3.05	2.54	3.33	3.34
red tree voles	0.65	0.81	0.92	0.81	0.81	0.78	1.01	0.86	1.08	1.06	0.97	0.72
amphibians	2.93	2.91	2.98	3.19	3.05	3.26	3.29	3.32	3.29	2.96	3.46	3.46
ungulates	2.90	2.74	2.71	3.09	2.92	3.05	3.00	3.15	2.81	2.68	3.25	3.48

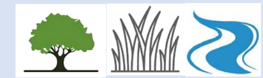
Management Strategies	A	K	C	M	G	N	H	L	E	B	D	J
Even-aged, short rotation	25%	8%	15%	5%	14%	9%	10%	10%	15%	39%	10%	8%
Even-aged, long rotation	27%	50%	39%	35%	35%	25%	24%	20%	15%	15%	10%	8%
Multi-aged, multi-species	20%	8%	10%	25%	20%	26%	24%	33%	15%	10%	39%	50%
Managed reserve	4%	8%	10%	9%	8%	8%	15%	10%	19%	10%	15%	8%
Ecosystems of concern	6%	8%	10%	9%	6%	14%	10%	10%	19%	10%	10%	8%
Long-term learning + non-forest												

more even-aged long rotation ← → less even-aged long rotation

Scenarios that maximize each forest value

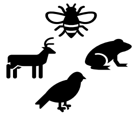
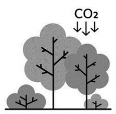
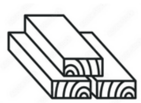


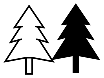
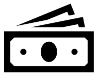
McDonald-Dunn Research Forest draft guidelines for each 'Management Strategy'

	 **Even-aged short rotation**	 **Even-aged long rotation**	 **Multi-aged multi-species**	 **Managed reserves**	 **Ecosystems of concern**
Guiding Principles	*Manage in a way that creates learning and research opportunities about short-rotation forestry and early seral conditions, under the principle of financial sustainability, informed by both Indigenous knowledge and Western science.*	*Manage in a way that creates learning and research opportunities about long-rotation forestry and retention of legacy elements throughout the life of each stand, informed by both Indigenous knowledge and Western science.*	*Manage in a way that creates learning and research opportunities about managing multi-aged and/or multi-species stands, informed by both Indigenous knowledge and Western science.*	*Manage in a way that ensures learning and research opportunities about the creation and maintenance of historical late-seral forest conditions informed by both Indigenous knowledge and Western science.*	*Manage in a way that creates learning and research opportunities about a range of restoration opportunities and intensities to improve and maintain the health and resiliency of selected ecosystems, informed by both Indigenous knowledge and Western science.*
Brief Summary	Even-aged plantations of Douglas-fir (or other climatic-appropriate species and genetic stock) will be established and managed to be financially competitive by maximizing yields of wood products valuable for domestic mills. Clearcut harvests will not exceed 80 acres (with limited exceptions due to large-scale disturbances). Rotation lengths will be regulated primarily by	Even-aged forests of Douglas-fir (or other climatic-appropriate species and genetic stock) will be established and managed to provide older forest conditions and produce high quality wood for domestic mills. Clearcut harvests will not exceed 40 acres (with limited exceptions due to largescale disturbances). ~10% of hardwood trees	Multi-aged, mixed-species forests of primarily Douglas-fir will be established and managed using shelterwood-with residuals, group-selection, and variable retention regeneration harvests to create heterogeneity in openings, regenerate new age classes of trees, and maintain structural diversity and visual aesthetics. Multiple native tree species will be encouraged. These harvests will not exceed 40 acres. *<u>Shelterwood-with-residuals</u>* - Final harvest of understory trees will be 60-70 years. The age of	These areas will be held and conserved outside the management base using only a light touch when needed to promote and maintain historical older-forest structural and compositional diversity, visual aesthetics, and provide for public safety. Forest succession and developmental processes following natural disturbances will proceed with little human intervention.	Restoration and maintenance activities will be undertaken in native oak savanna/woodlands, meadows, and riparian/aquatic systems. Two strategies will be employed: • retain and conserve the most at-risk and highest value components of ecological and cultural diversity, and • use intensive efforts where needed to improve and restore broader

	age that maximizes net revenue production. ~5% of hardwood trees and/or resprouts will be identified and purposely left free to grow in the understory. Rotations will be 30-60, likely 35-45 years.	and/or resprouts will be identified and purposed left free to grow in the understory throughout the rotation. Rotations typically will be 60-90 years, with <10% managed to 120 years.	the oldest trees harvested from these stands will be 60-120 years, regulated primarily by the complexity of habitat desired for each stand. *Group-selection* - Re-entry harvest will occur every 15-30 years to create 3-4 age classes. Minimum proximity of group selection openings to previous harvest entries will be >200 feet. *Variable retention harvest* – Re-entry harvest will occur every 15-30 years to create 3-4 age classes.	Areas added to the existing reserve base may need more active operations to promote the development of historical conditions. The age of the oldest trees in these stands will continue to increase over time, adding to the age-class diversity across the forest.	ecological and/or cultural functions at specific sites. The age of the oldest trees in oak ecosystems will tend to increase over time. For riparian ecosystems, tree age will increase for long-lived conifers but for alders and other short-lived species, tree age may decrease as they achieve senescence and die.

Metrics used to evaluate tradeoffs among land use allocation scenarios for the McDonald-Dunn Forest

Forest Value		What does the measurement reflect?	How to interpret what is acceptable or desirable?
Biodiversity		• An index of habitat suitability for 6 focal taxa (bees, early successional birds, late successional birds, red tree voles, ungulates, amphibians) • Values range from 0 to 5	• Lower values indicate lower habitat suitability for all focal taxa across the entire forest. • Higher values indicate greater habitat suitability for all focal taxa across the entire forest.
Forest carbon		• Amount of carbon in the vegetation but not the soil, in metric tons • Values could range from a minimum of 0 to maximum a site could support	• Lower values could mean lesser amounts of fuel that increases wildfire hazard. • Higher values indicate additional sequestering of atmospheric carbon and may generate revenue if carbon markets emerge.
Forest products		• Volume of harvested timber, in board feet • Values could range from a minimum of 0 to maximum a site could support	• Total volume is influenced by the amount of each product type created (poles vs lumber vs pulpwood). • Volume produced influences local jobs, directly and indirectly
Recreation acceptability		• A measure of recreationists' perceptions of aesthetic acceptability of forest conditions • Ratings were on a scale of 1 to 5, with 1 being *very unacceptable* and 5 *very acceptable*	• Lower values reflect lower acceptability of forest conditions across forest recreation users. • Higher values reflect greater acceptability of forest conditions across forest recreation users.
Resilience-density		• A measure of forest density, derived as stand density index (SDI) relative to maximum possible stand density index in the region • Raw values could range from 0 to 100%, and were converted to scores of 0 to 5 to simplify interpretation (see score descriptions at right)	• Lower values reflect lower resilience often associated with dense stands that experience greater individual tree stress. **0** = ≥75% (conditions where even co-dominant-sized trees are stressed and dying) **1** = 65-75% (conditions reflect a thick stand; trees undergo high stress; many standing dead trees are present) **2** = 55-65% (conditions reflect the onset of self-thinning mortality, first expressed only in the smallest tree classes) **3** = 45-55% (conditions provide for optimal stand-level growth rates) **4** = 35-45% (moderately open space; similar to conditions after a heavy thinning) **5** = <35% of maximum SDI (open space such that regeneration is likely; similar to conditions following a shelterwood harvest)

Resilience-composition		• A measure of Douglas-fir dominance, derived as % of total basal area that is some tree species **other than** Douglas-fir • % Non-Douglas-fir basal area (NDFBA) = Non-Douglas-fir basal area / Total basal area x 100 • Raw values could range from 0 to 100%; these were converted to scores of 0 to 5 to simplify interpretation (see score descriptions at right)	• Lower values indicate forests dominated by a single species (Douglas-fir), which may mean greater susceptibility to stressors associated with changing climatic conditions, such as drought and pressure from insects and pathogens. • Higher values indicate greater prevalence of trees of other species, which may mean lower stand-level susceptibility to stressors. **0** = 0 % | **1** = 0.01 – 10.0 % | **2**= 10.01 – 20.0 % **3** = 20.01 – 30.0 % | **4** = 30.01 – 40.0 % | **5** = > 40 % NDFBA
Revenue		• Total income versus expenditures, in $ • Values could range from a minimum of 0 to some maximum	• Reflects revenue earned through timber harvest minus that used for reforestation, restoration of Ecosystems of Concern, invasive species treatment, fuel reduction, roads and buildings, recreation, and all other maintenance needs and salaries and operational expenses.
Wildfire resistance		• A measure of stand resistance to wildfire incorporating average stand-level *crown bulk density* (the density of available canopy fuel in a stand, CBD), *canopy base height* (the average height from the ground to the average canopy bottom, CBH), and *surface fuel loading* (the amount of fuels near the ground) • Wildfire Resistance = Sum Scores (CBD + CBH + SFL) after converting CBD and CBH and SFL scores from raw numbers to 0, 1, 2 • Values range from 0 to 6 (see score descriptions at right)	• Lower values indicate less resistance to wildfire, due to abundant crown fuels and low canopy base height that could enable surface fires to transition into active crown fire. • Scores range from 0 to 6, with interpretations below. **0** = extremely low | **1** = very low | **2** = low | **3** = moderate **4** = high | **5** = very high | **6** = extremely high