College Forest Updates: McDonald & Dunn Forest Management Planning Process

Spring 2022 – Fall 2024

Community Input Session Agenda

- 6:00-6:10pm – Introduction & ground rules (Turner O'Dell)
- 6:10-6:50pm – Formal presentation (Holly Ober)
- 6:50-7:00pm – Indigenous perspectives (Cristina Eisenberg)
- 7:00-7:15pm – Questions about the management strategies, scenarios, or modeling
- 7:15-9:00pm - Participant input

Community Input Session Ground Rules

- Speak up – participate and share ideas (that’s why we are here!)
- Make room – for others to do the same (keep within established time limits)
- Listen with respect – seek to learn and understand each other’s perspectives
- Be civil – OK to be tough on issues, not on people – no personal attacks
- Accept that you may disagree – but try to disagree without being disagreeable
- Silence cell phones, etc.

MCDONALD-DUNN RESEARCH FOREST PLANNING PROCESS

The OSU College of Forestry is developing a new management plan for the McDonald and Dunn Research Forests, which is anticipated to be ready for implementation in 2025. The new research forest plan will reflect the college's diverse values, and will position the McDonald-Dunn Research Forest to be a model example of multiple value forest management. Management decisions and activities on the McDonald-Dunn Research Forest will be driven by research agendas, education and demonstration opportunities, and considerations of an inclusive balance of forest uses and values. The full intent of the research forests is described in the Vision, Mission, and Goals.

The process of developing the new management plan will involve opportunities for public input, and two committees working in tandem from spring 2022 through fall 2024.

- Public input opportunities include two Community Listening Sessions to gather information on aspirations and concerns of forest users early in the planning process, two Community Input Sessions to gather input on forest land allocation decisions late in the planning process, a webform through which written comments can be provided, and an email to which written questions can be sent. We usually respond within 14 days.
- Two committees will assist in the development of the new plan: an external Stakeholder Advisory Committee (SAC) comprised of 13 individuals representing a variety of interests and expertise and College of Forestry Faculty Planning Committee (FPC) comprised of 10 individuals representing 5 academic departments. Comments submitted through the webform will be forwarded to these committees.

Upcoming Meetings & Events:

- June 3, 2024, 9am-noon, Stakeholder Advisory Committee Meeting. Zoom link: https://pdx.zoom.us/j/85123309661 (agenda, open to the public to listen remotely through Zoom but not comment, video will be posted afterwards)
- June 5, 2024, 6pm - 8 pm, Community Input Session. Join in person in PFSC 117 or via Zoom link: https://pdx.zoom.us/j/82322501716

Past Meetings & Events:

- June 14, 2022, SAC and FPC Joint Kickoff Meeting (agenda, video, meeting summary)
- Aug 30, 2022, SAC Meeting (agenda, presentation, meeting summary)
- Aug. 31, 2022, Community Listening Session (agenda, presentation, meeting summary)
- Sept. 16, 2022, Faculty Planning Committee Meeting (agenda, presentation, meeting summary)
- Sept. 20, 2022, Stakeholder Advisory Committee Meeting (agenda, presentation, video recording, meeting summary)
- Oct. 11, 2022, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Oct. 25, 2022, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Nov. 7, 2022, Community Listening Session (agenda, presentation, video recording, meeting summary)
- Nov. 22, 2022, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Dec. 5, 2022, Stakeholder Advisory Committee (agenda, presentation, video recording, meeting summary)
- Dec. 6, 2022, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)- Remarks made by an individual during the Dec 6 Faculty Planning Committee meeting do not reflect the values of the university or the College of Forestry, or our shared commitment to respectful discussion and engagement. The College appreciates all input being provided in planning the future of the McDonald-Dunn Research Forests and is committed to listening to and considering all perspectives with respect. An apology for these remarks was made during the Stakeholder Advisory Committee meeting on Dec 13.
- Dec. 13, 2022, Stakeholder Advisory Committee Meeting (agenda, video recording, meeting summary)
- Dec. 20, 2022, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Jan. 18, 2023, Stakeholder Advisory Committee (agenda, presentation, video recording, meeting summary)
- Jan. 23, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Feb. 6, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Feb. 20, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Feb. 25, 2023, SAC and FPC Joint Field Tour
- Mar. 1, 2023, Stakeholder Advisory Committee Meeting (agenda, presentation, video recording, meeting summary)
- Mar. 6, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Mar. 20, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Mar. 21 & 22, 2023, Academic User Listening Sessions (open forums)
- Mar. 27, 2023, SAC and FPC Joint Field Tour
- Apr. 13, 2023, Stakeholder Advisory Committee Meeting (agenda, presentation 1, presentation 2, video recording, meeting summary)
- Apr.17, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- May 1, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- June 12, 2023, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Oct. 17, 2023, Faculty Planning Committee meeting (agenda, presentation, video recording, meeting summary)
- Oct. 31, Faculty Planning Committee meeting (agenda, presentation, video recording, meeting summary)
- Nov. 14, Faculty Planning Committee meeting (agenda, presentation, video recording, meeting summary)
- Nov. 28, Faculty Planning Committee meeting (agenda, presentation, video recording, meeting summary)
- Dec. 12, Faculty Planning Committee meeting (agenda, presentation, video recording, meeting summary)
- Jan 25, 2024, Faculty Planning Committee Meeting (agenda, presentation, video recording, meeting summary)
- Jan 30, 2024, Stakeholder Advisory Committee Meeting (agenda)
- Feb 22, 2024, Faculty Planning Committee Meeting, (agenda, presentation, video recording, meeting summary)
- May 30, 2024, Faculty Planning Committee Meeting. (agenda, presentation, video recording)

SUBMIT YOUR COMMENTS SUBMIT YOUR QUESTIONS STAY CONNECTED

READ PUBLIC COMMENTS HISTORIC DOCUMENTS - MCDONALD-DUNN RESEARCH FOREST PLANNING 2004-PRESENT

McDonald-Dunn Research Forest Management Planning Process

Phase I: Information gathering, Discussions, Assessment of former FMP (Spring-Summer 2022)

- Initial Interviews
- Inventory of COF Academic Use
- Community Listening Session I
- Stakeholder Advisory Committee Meetings
- Faculty Planning Committee Meetings
- Comment / Question Submission

Phase II: Synthesizing, Modeling, Writing, Refining (Fall 2022-Summer 2024)

- Stakeholder Advisory Committee Meetings
- Faculty Planning Committee Meetings
- Community Listening Session II
- Academic User Listening Session
- Community Input Sessions I & II
- Comment / Question Submission

Phase III: Finalizing

- Presentation of draft plan to the Dean & Forestry Executive Committee for review
- Forest management plan refinement
- Forest management plan approval by Dean

Anticipated Steps

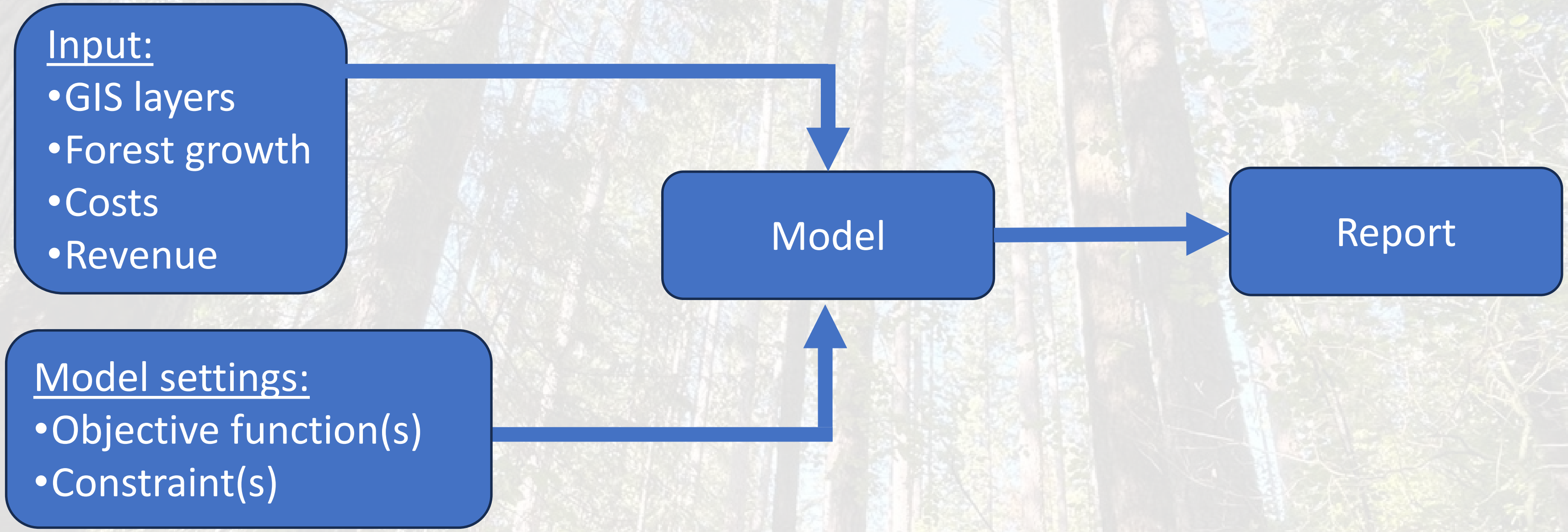
What are talking about when we refer to ‘modeling’?

Forest modeling = simulating

- Forest management is complex
  - managed over long time periods
  - unpredictable natural processes
  - diverse values associated with natural resources lead to the need to evaluate tradeoffs
- Mathematical programming is a tool that can find solutions to complex problems (e.g., sustained yields of forest products, allocation of specific acreages of to particular forest conditions).
- Modeling allows us to make data-driven decisions. It does not predict the future. It does simulate scenarios so that we can evaluate trade-offs.
- These analyses also help us optimize timelines and schedules.

The basics of harvest schedule modeling

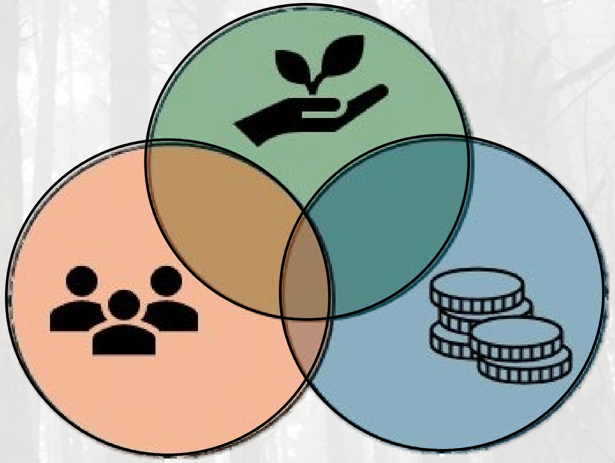
- Mathematical planning tools assist in determining what areas of the forest to harvest and when [Woodstock]

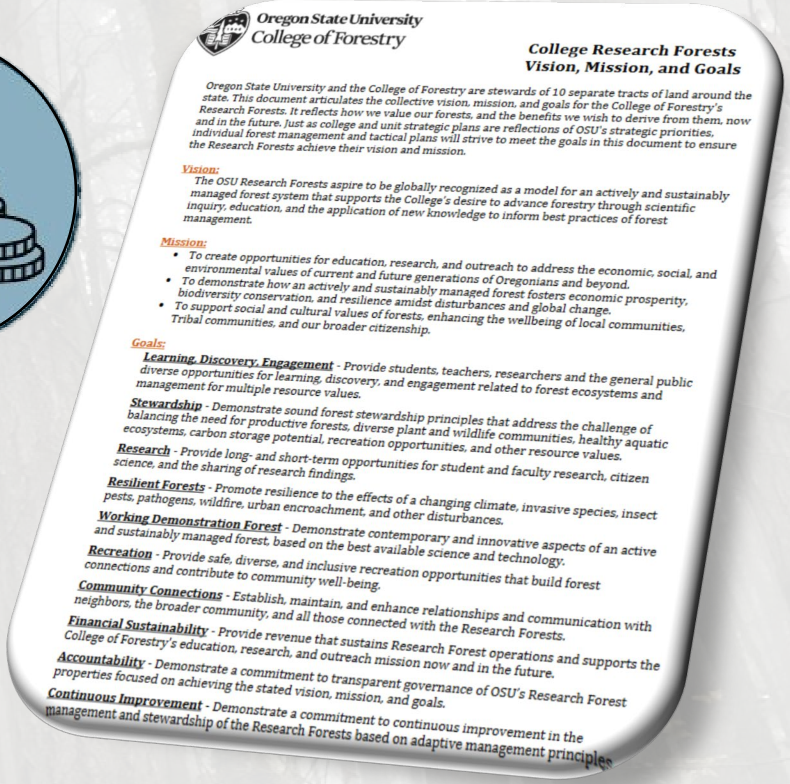


- The model attempts to find “optimal” solutions by assigning stands to management strategies

The modeling process is complex because managing a research forest is complicated

- The Research Forests are guided by a vision, 3 missions, and 10 goals
- Reminder: the 10 goals
  - Learning, discovery, engagement
  - Stewardship
  - Research
  - Resilient forests
  - Working demonstration forest
  - Recreation
  - Community connections
  - Financial sustainability
  - Accountability
  - Continuous improvement





Oregon State University
College of Forestry

College Research Forests
Vision, Mission, and Goals

Oregon State University and the College of Forestry are stewards of 10 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.

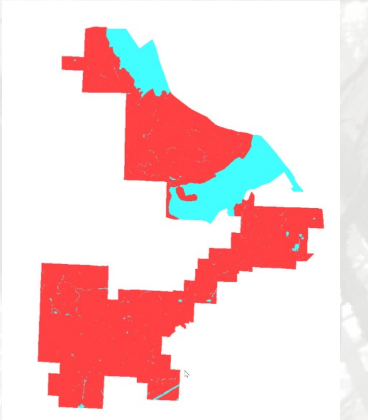
Community Connections - Establish, maintain, and enhance relationships and communication with neighbors, the broader community, and all those connected with the Research Forests.

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

The McDonald-Dunn Forest is complex



- The McDonald-Dunn Forest is comprised of 386 stands
- There are 11 silvicultural options
  - Even-aged (short, long, extra-long)
  - Uneven-aged (group selection, individual-tree selection, two-storied, variable retention)
  - Other (oak savanna, meadow, riparian, managed reserve)
- All costs associated with management and maintenance must be accounted for
  - Harvest, site prep, planting, interplanting, chemical release, subsequent thinning
  - Must consider type of harvest, as dictated by slope (e.g., ground, cable)
  - Also, many fixed costs associated with maintaining the forest
- There are ~90 stands devoted to long-standing research that cannot be compromised
- All this means that the model must make hundreds of thousands of decisions so we can understand the ramifications of land allocation decisions

What conditions are we anticipating on the forest?

5 'Forest Management Strategies' for the new plan

A. Even-aged, short rotation

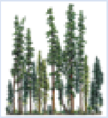
B. Even-aged, long rotation

C. Multi-aged, multi-species

D. Managed reserves

E. Ecosystems of concern (oak woodlands, meadows, riparian)

McDonald-Dunn Research Forests draft guidelines for each new 'Management Strategy'

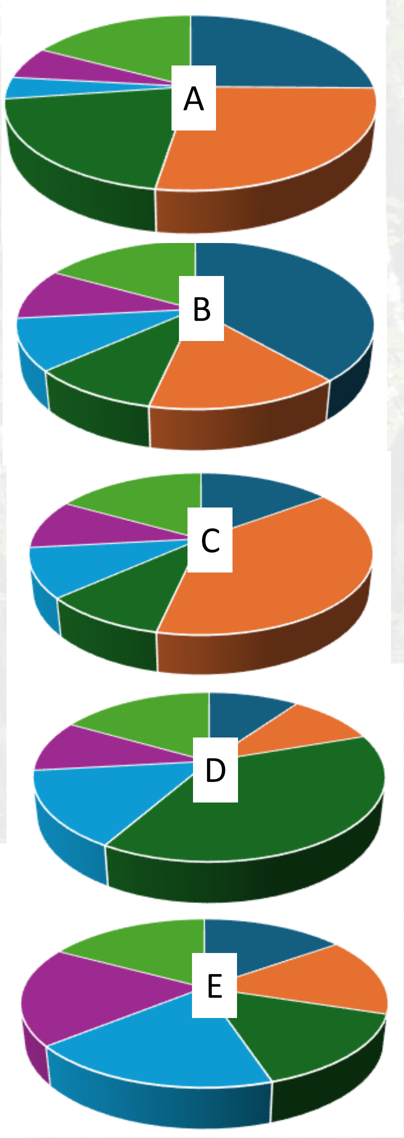
	 **Even-aged short rotation**	 **Even-aged long rotation**	 **Multi-aged multi-species**	 **Managed reserves**	 **Ecosystems of concern**
Guiding Principles	*Manage in a way that creates learning and research opportunities about short-rotation forestry and early seral conditions, under the principle of 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 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.	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 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.	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. *Shelterwood-with-residuals* - Final harvest of understory trees will be 60-70 years. The age of 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.	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. 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.	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 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.

What decisions will the model results help us make?

Recap: Modeling of 5 Scenarios to Evaluate Tradeoffs

Proportion	2024 Scenario A (baseline)	Scenario B (lots of EASR)	Scenario C (lots of EALR)	Scenario D (lots of MAMS)	Scenario E (lots of MR & EOC)
Even-aged, short rotation	25%	39%	15%	10%	15%
Even-aged, long rotation	27%	15%	39%	10%	15%
Multi-aged/multi-species	20%	10%	10%	39%	15%
Managed reserve	4%	10%	10%	15%	19%
Ecosystems of concern	6%	10%	10%	10%	19%
Long term learning + non-forest *	17%	17%	17%	17%	17%
TOTAL	100%	100%	100%	100%	100%

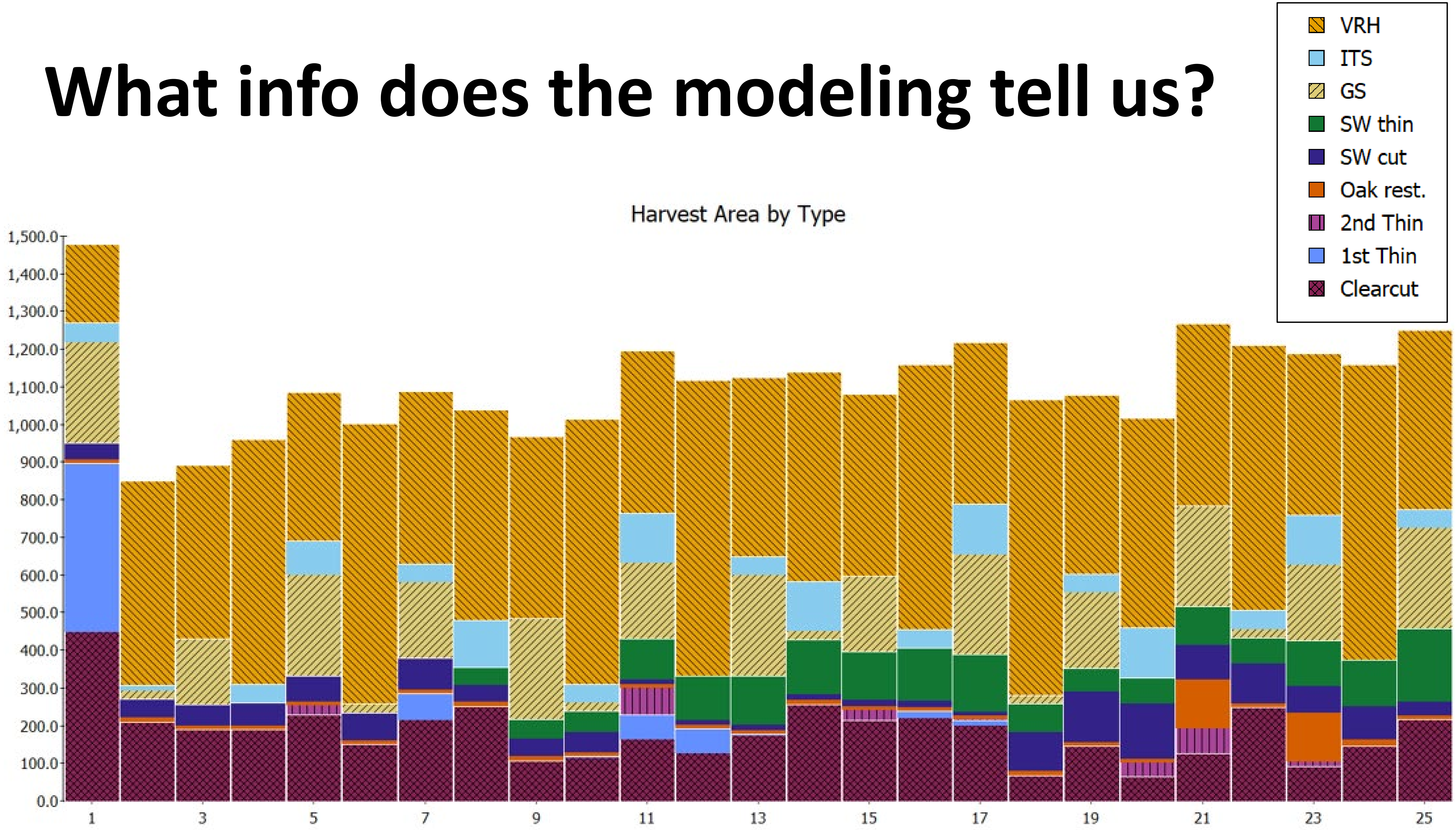
* long-term learning + non-forest = acreage unavailable for allocation because held for long-term research or roads, powerlines, lake, quarry, etc.



Model parameters and constraints

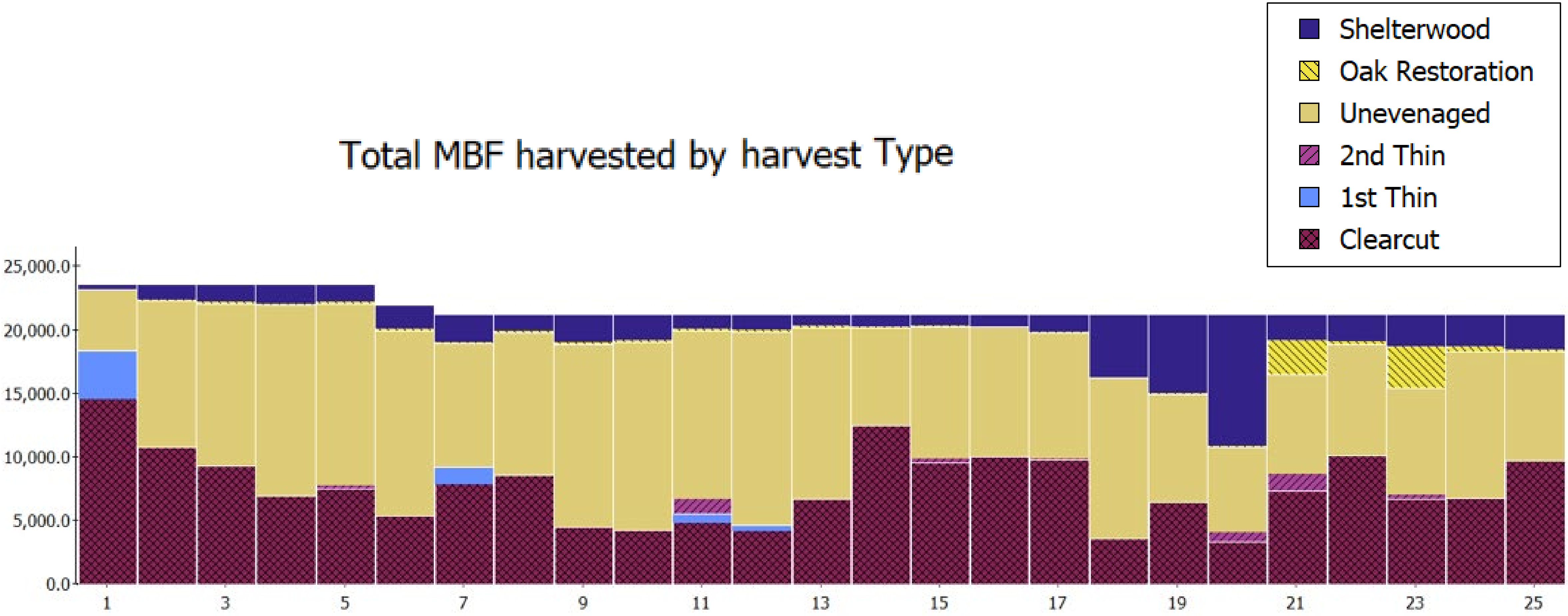
- Modeling occurred at 5-year time steps for 125 years
- **Reforestation constraint** – any harvested stand must be replanted (except thinning, ecosystems of concern)
- **Cash-flow positivity constraint** – revenue within each 5-year period must equal or exceed expenditures
- **Bounded even flow constraint** – timber volume can fluctuate no more than 10% between lowest and highest 5-year periods
- **Acreage constraints**
  - Minimum of 10 acres of oak savanna and meadow must be restored each 5-year period
  - Maximum of 750 acres harvested through clearcuts each 5-year period (i.e., <150 acres/year)

What info does the modeling tell us?



Time period (recall, 5-year time intervals… predictions out to 125 years)

What info does the modeling tell us?



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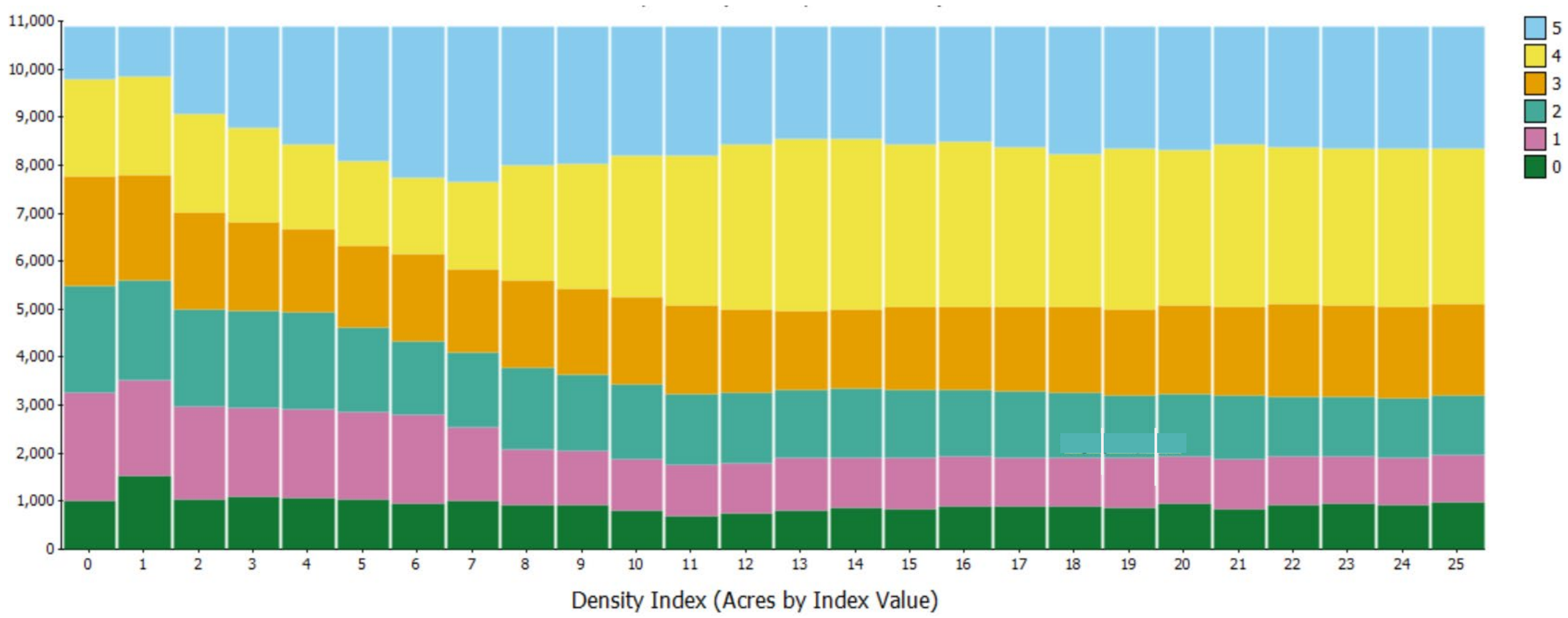
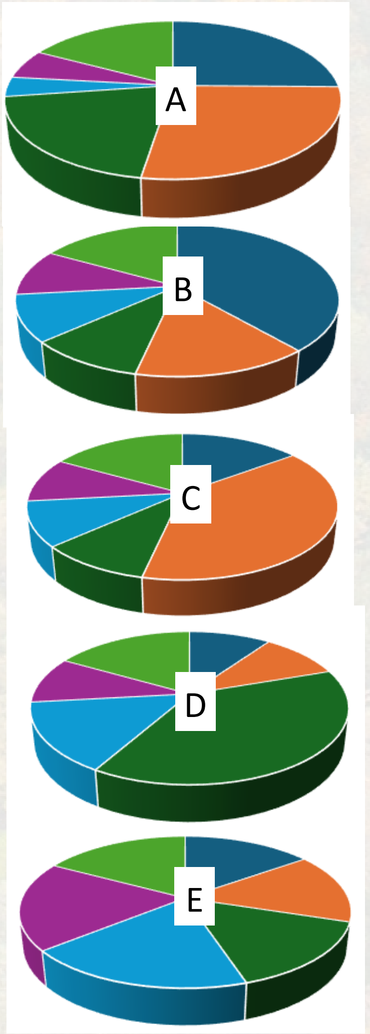


How will we assess tradeoffs among the 5 land allocation scenarios?

2024

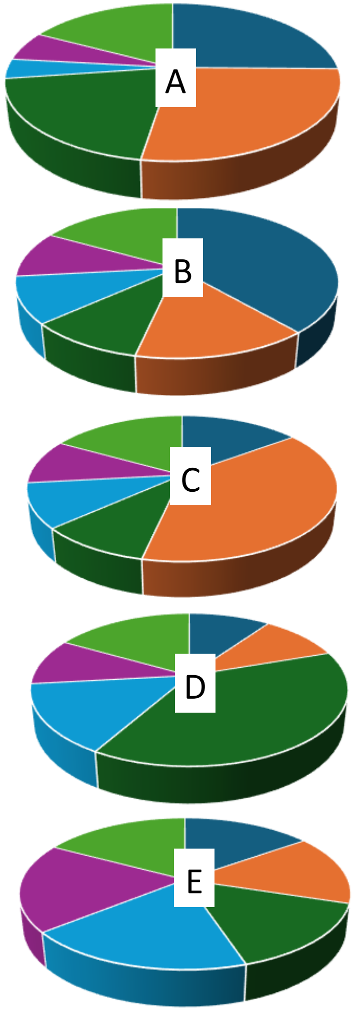
How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Biodiversity		Habitat suitability of focal taxa
Forest carbon		Amount of forest carbon
Forest products		Volume of timber harvested
Recreation acceptability		Perceptions of recreationists of aesthetic acceptability
Resilience - density		Resilience as related to tree density and stand conditions
Resilience - composition		Resilience as related to degree of dominance of Douglas-fir
Revenue - net		Total revenue derived from timber less operational expenses
Wildfire resistance		Degree of resistance to wildfire

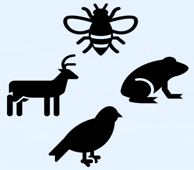


How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Biodiversity		Habitat suitability of focal taxa (bees, early successional birds, late successional birds, red tree voles, ungulates, amphibians)

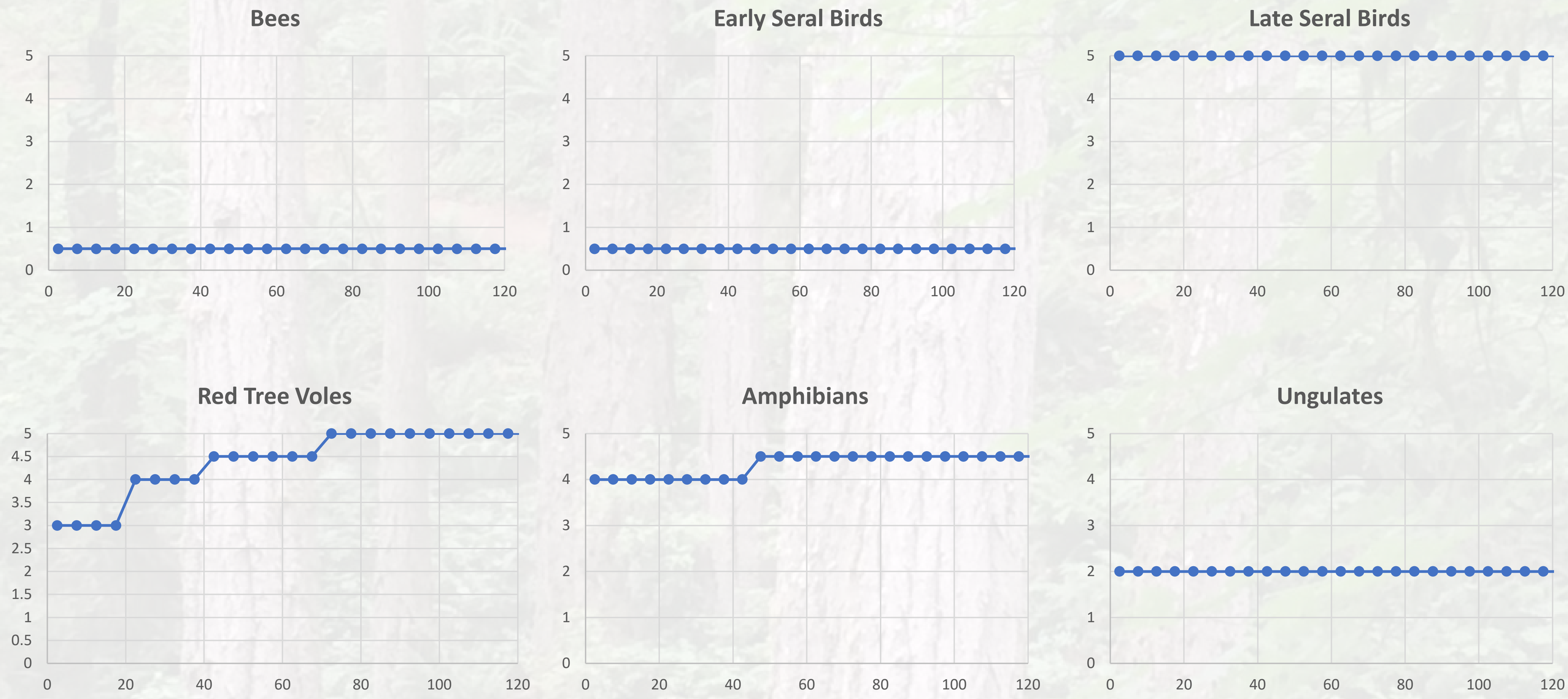


Biodiversity

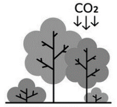


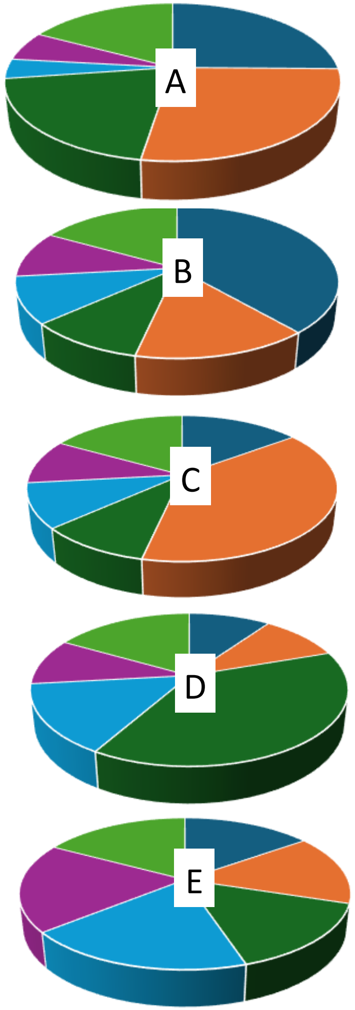
- Reflects habitat suitability of several focal taxa
- July 2023 meeting of 8 experts knowledgeable about forest-dependent wildlife to discuss potential approaches
- Decided to adopt approach described in Harris & Betts 2023
- Convened 6 groups of taxonomic experts to develop graphs describing habitat quality relationships for specific groups of animals according to stand conditions
- 6 focal taxa: bees, early successional birds, late successional birds, red tree voles, ungulates, and amphibians

Biodiversity – example data – Managed Reserves

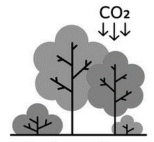


How will we assess tradeoffs among scenarios?

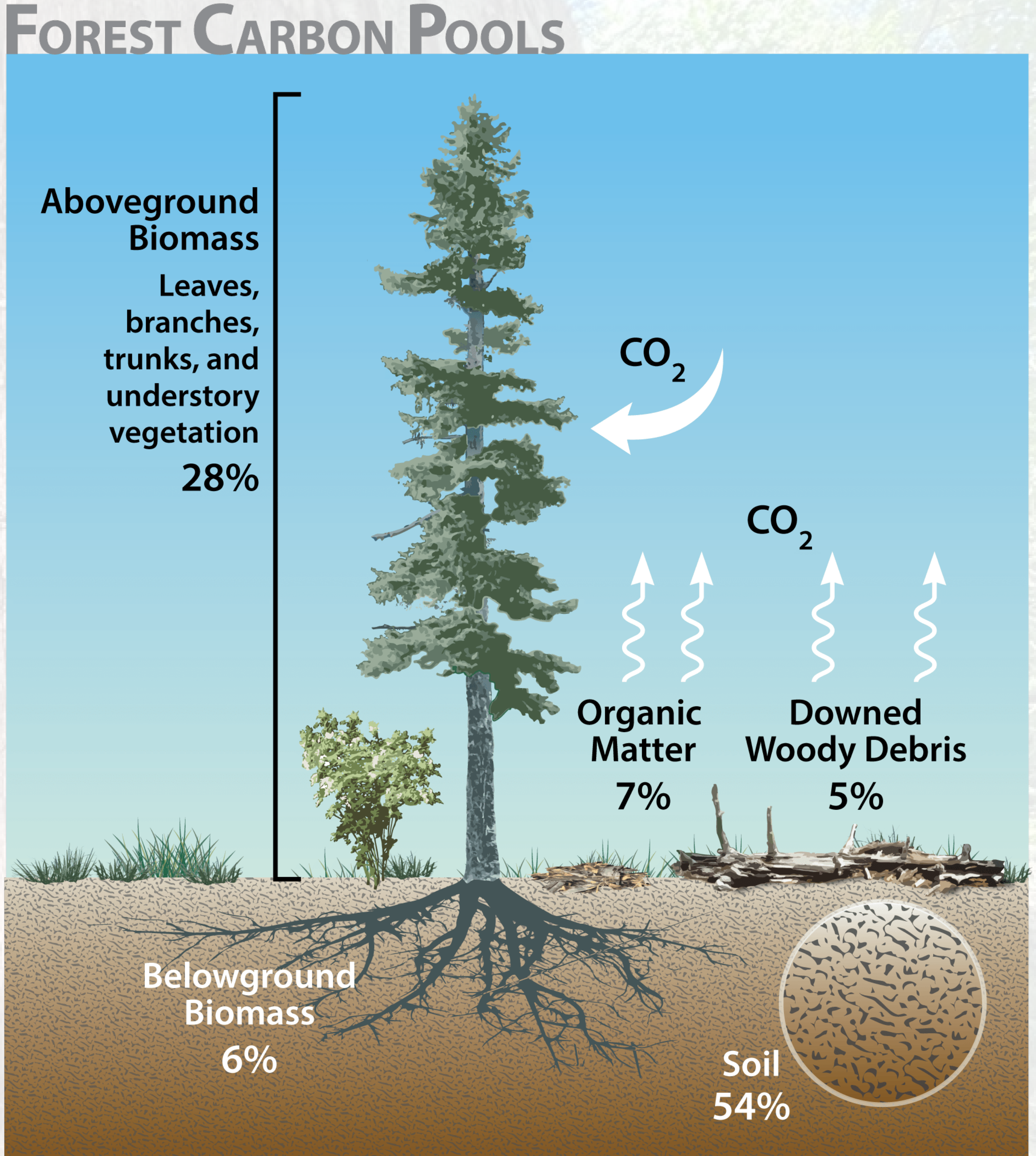
Forest Value		What are we trying to measure?
Forest carbon		Amount of forest carbon



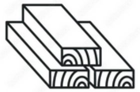
Forest Carbon

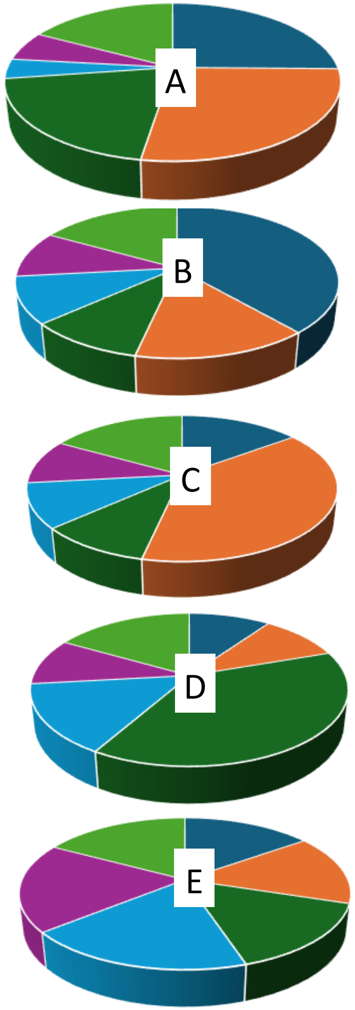


- A measure of above and below ground biomass associated with live and dead trees
- Includes stems, branches, foliage, and roots of live and dead trees
- Includes shrubs and herbs, litter and duff
- Does NOT include soil



How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Forest products		Volume of timber harvested

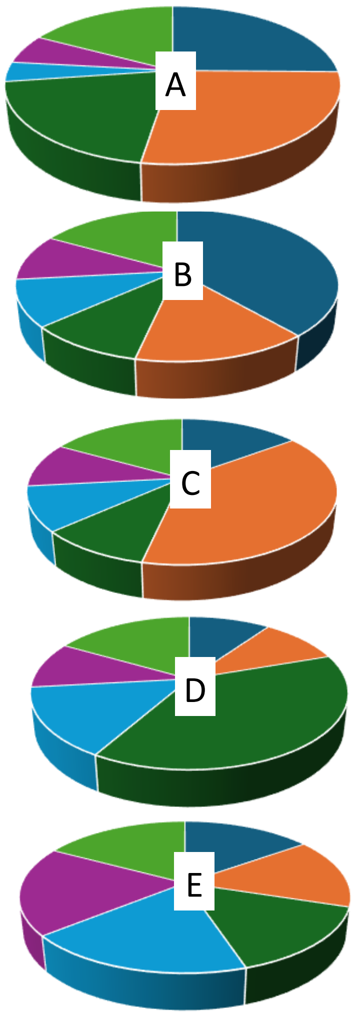


Forest Products

- Volume of timber harvested
- Estimates take into account:
  - tree species
  - log diameter and length
- Tree species include Douglas-fir, grand fir, red alder, western hemlock, madrone, Oregon ash, and others

How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Recreation acceptability		**Perceptions of recreationists of aesthetic acceptability**



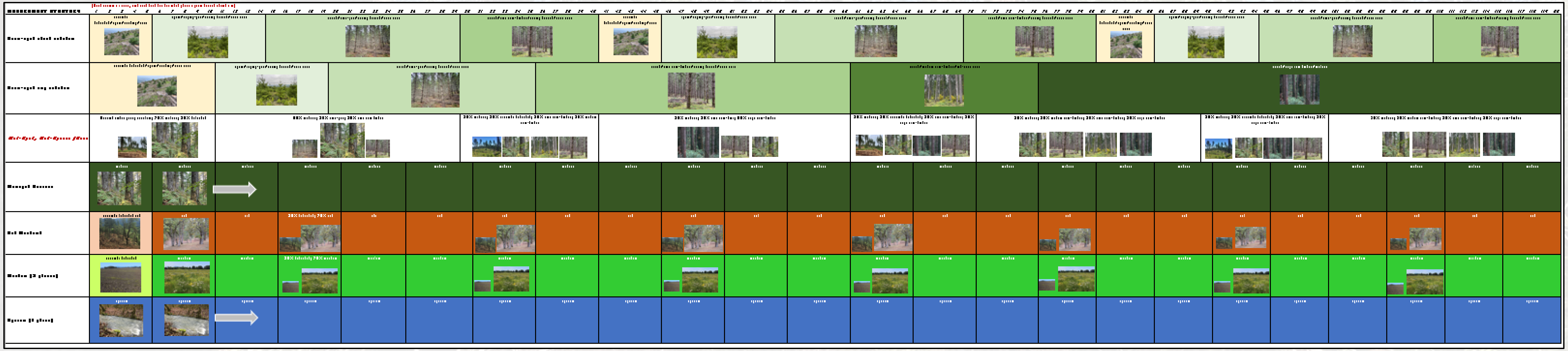
Recreation acceptability

- A measure of forest condition preferences of recreational users of the forest
- Forest visitors were shown a series of 14 photos and asked to rate how acceptable each forest-scenic condition was in maintaining the quality of their recreational experience
- Ratings were on a scale of 1 to 5
  - 1 = *very unacceptable*
  - 5 = *very acceptable*

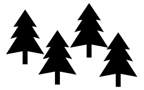
Recreation acceptability

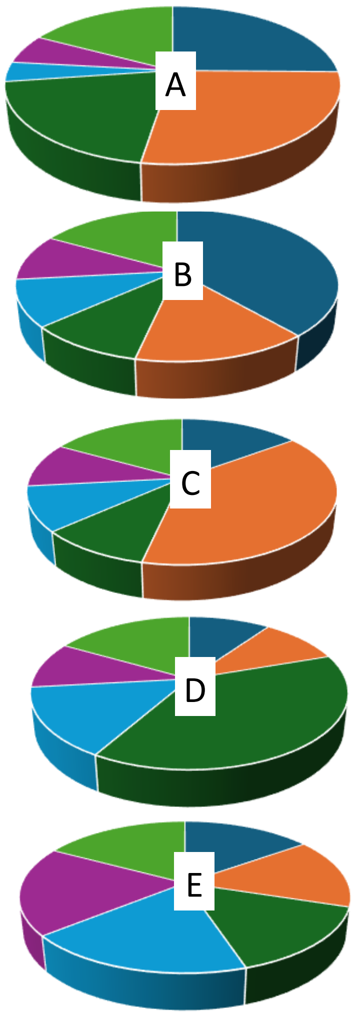
- We determined how many years would be spent in conditions depicted by each photo in each management strategy
- We scaled according to % of acreage in each scenario

Phase Descriptions
recently disturbed/open/seedling/early seral
open/sapling-pole/young forest/early seral
closed/small-pole/young forest/early seral
closed/small saw-timber/young forest/early seral
closed/medium saw-timber/mid-early seral
mature
recently disturbed oak woodland
intact oak woodland
recently disturbed meadow
intact meadow
intact riparian



How will we assess tradeoffs among scenarios?

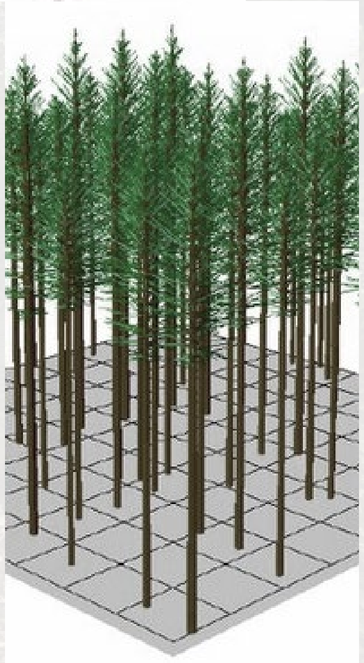
Forest Value		What are we trying to measure?
Resilience - density		**Resilience as related to tree density and stand conditions**



Resilience - density

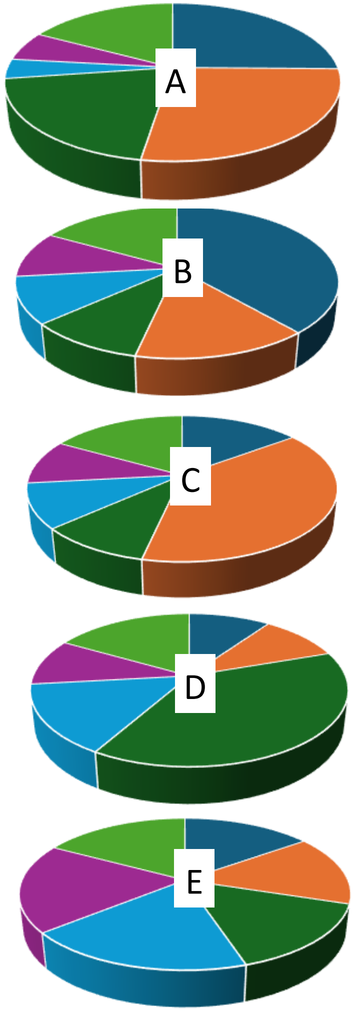
- A measure of tree density, derived as **stand density index (SDI)** relative to **maximum possible stand density index** in the region
- Raw values could range from 0 to 100%, and were converted to scores of 0 to 5 to simplify interpretation
- Score interpretation – degree of stress resulting from competition

Score	% of maximum SDI	Conditions
5	<35%	open space such that regeneration is likely; similar to conditions following a shelterwood harvest
4	35-45%	moderate open space; similar to conditions after a heavy thinning
3	45-55%	conditions provide for optimal stand-level growth rates; the archetypal plantation management zone
2	55-65%	conditions reflect the onset of self-thinning mortality, first expressed only in the smallest tree classes
1	65-75%	conditions reflect a thick stand; trees undergo high stress; many standing dead trees are present
0	>75%	conditions where even co-dominant-sized trees are stressed and dying



How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Resilience - composition		Resilience as related to degree of dominance of Douglas-fir



Resilience - composition

- A measure of Douglas-fir dominance, derived as % of total basal area that is some tree species *other than* Douglas-fir

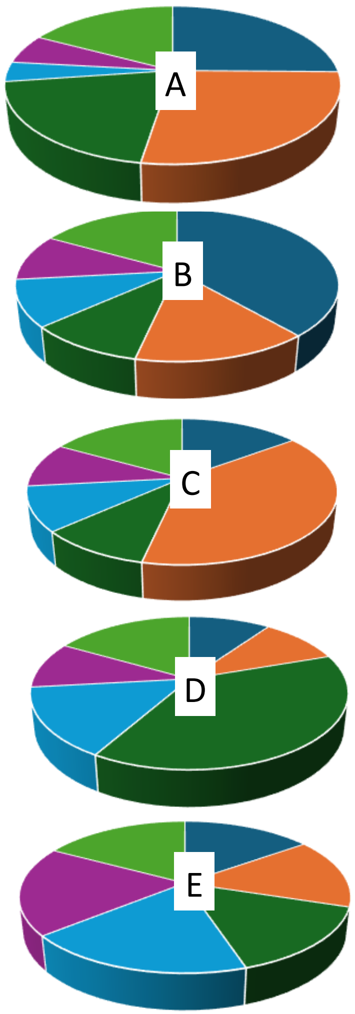
- Raw values could range from 0 to 100%; converted to scores from 0 to 5

- Lower scores (lower percentage values) indicate stands are heavily dominated by a single species (Douglas-fir), which may mean greater susceptibility to future stress associated with changing climatic conditions (e.g., drought) and insects or pathogens

Score	Raw Values
5	>40%
4	30.01 – 40%
3	20.01 – 30%
2	10.01 – 20%
1	0.01 – 10%
0	0%

How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Revenue		**Total revenue derived from timber less operational expenses**

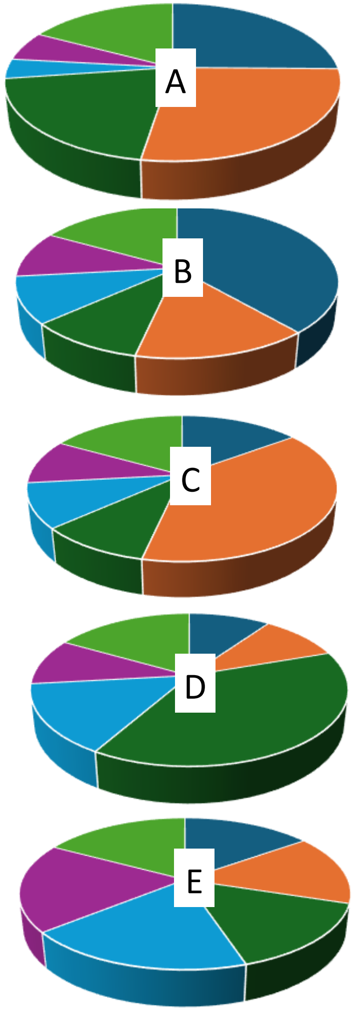


Revenue - net

- Projected revenue earned through timber harvest minus that used for reforestation, restoration of Ecosystems of Concern, fuel reduction, roads, recreation, all other forest management activities, and all other maintenance needs and salaries
- Fixed costs incurred each year include personnel salaries, admin support, maintenance of roads and buildings and vehicles, cultural resources, wildlife surveys, outreach and interpretation, fire protection, research support

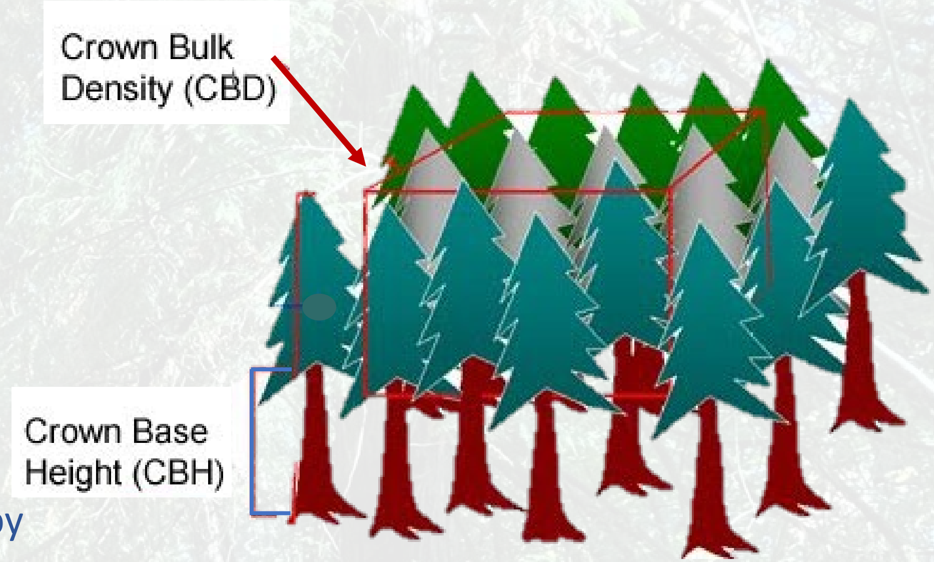
How will we assess tradeoffs among scenarios?

Forest Value		What are we trying to measure?
Wildfire resistance		Degree of resistance to wildfire



Wildfire resistance

- Comprised of 2 metrics
- **Canopy Bulk Density** (CBD) – *amount of canopy fuels*
  - the mass of available canopy fuel per canopy volume unit
  - CBD influences likelihood of active crown fire and rate of fire spread
- **Canopy Base Height** (CBH) – *arrangement of canopy fuels*
  - the average height from the ground to the bottom of a stand's canopy
  - CBH is the lowest height in a stand at which there is a sufficient forest canopy fuel to propagate fire vertically into the canopy



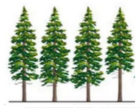
- **Wildfire Resistance** = Sum Scores (CBD + CBH) after converting CBD and CBH scores from raw numbers to 0, 1, 2
  - Canopy bulk density
    - **2** = 0 - 0.065
    - **1** = 0.0651 – 0.13
    - **0** = > 0.13
  - Canopy base height
    - **2** = >20.0ft
    - **1** = 6.01 – 20.0ft
    - **0** = <6.0ft

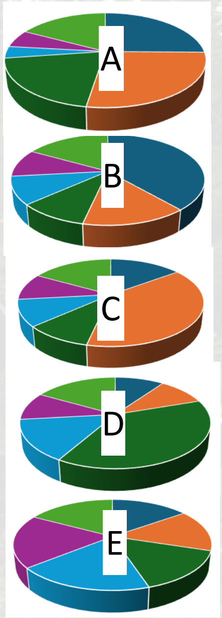
Score	Interpretation
4	Very high resistance; open and elevated canopies
3	High resistance
2	Moderate resistance
1	Low resistance
0	Very low resistance; dense, low canopies

Let’s assess tradeoffs among the 5 land allocation scenarios

Assessing tradeoffs among land allocation scenarios

- Relative comparison with baseline scenario, showing exact % change & color-coded % change

	2024				
Forest Value	**Scenario A (baseline)**	**Scenario B (lots of EASR)**	**Scenario C (lots of EALR)**	**Scenario D (lots of MAMS)**	**Scenario E (lots of MR & EOC)**
Biodiversity (avg across all taxa)	1.58	-11%	-11%	-13%	-26%
Forest carbon	1,033,578T	+9%	+10%	+55%	+41%
Forest products (per 5 years)	30MMBF	-15%	-12%	-28%	-36%
Net revenue (per 5 years)	$9.6 Mil	-26%	-22%	-39%	-58%
Recreation acceptability	3.42	+1%	+2%	+5%	+5%
Resilience - density	2.55	-5%	-4%	-48%	-36%
Resilience - composition	1.59	+2%	+1%	+20%	+16%
Wildfire resistance	2.68	no change	-1%	-7%	-5%

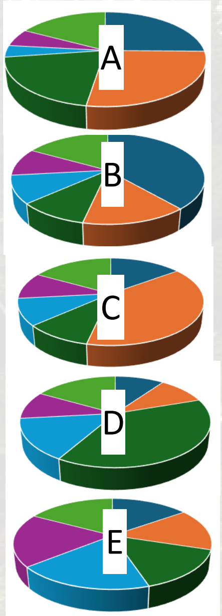


Considerable increase (>50% increase or +++)
Modest increase (10-50% increase or ++)
Little change (10% increase – 10% decrease or +, -)
Modest decrease (10-50% decrease --)
Considerable decrease (>50% decrease or ---)

Assessing tradeoffs among land allocation scenarios

- Relative comparison with baseline scenario, showing raw numbers & color-coded % change

	2024				
Forest Value	**Scenario A (baseline)**	**Scenario B (lots of EASR)**	**Scenario C (lots of EALR)**	**Scenario D (lots of MAMS)**	**Scenario E (lots of MR & EOC)**
Biodiversity (avg across all taxa)	**1.58**	**1.41**	**1.41**	**1.38**	**1.17**
Forest carbon	**1,033,578T**	**1,121,824T**	**1,134,613T**	**1,597,314T**	**1,456,981T**
Forest products (per 5 years)	**30MMBF**	**25MMBF**	**26MMBF**	**22MMBF**	**19MMBF**
Net revenue (per 5 years)	**$9.6 Mil**	**$7.1 Mil**	**$7.5 Mil**	**$5.9 Mil**	**$ 4.0 Mil**
Recreation acceptability	**3.42**	**3.44**	**3.48**	**3.58**	**3.60**
Resilience - density	**2.55**	**2.42**	**2.44**	**1.33**	**1.62**
Resilience - composition	**1.59**	**1.62**	**1.61**	**1.91**	**1.85**
Wildfire resistance	**2.68**	**2.68**	**2.66**	**2.49**	**2.55**



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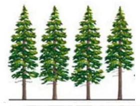
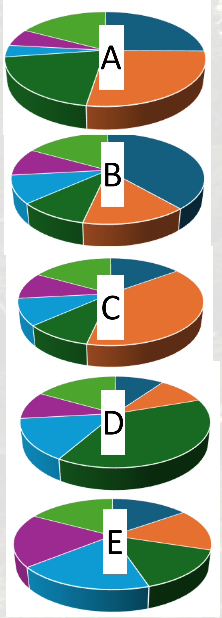
Assessing tradeoffs among land allocation scenarios

- Relative comparison with baseline scenario, showing raw numbers & color-coded % change

	2024				
Forest Value	Scenario A (baseline)	Scenario B (lots of EASR)	Scenario C (lots of EALR)	Scenario D (lots of MAMS)	Scenario E (lots of MR & EOC)
Biodiversity (avg across all taxa)	**1.58**	**1.41**	**1.41**	**1.30**	**1.17**
bees	0.88	-13%	-1%	-13%	-19%
early seral birds	1.17	-18%	no change	-21%	-31%
late seral birds	2.09	-8%	-15%	+8%	-17%
ungulates	0.71	+15%	-37%	-60%	-48%
amphibian	2.26	-15%	-10%	-16%	-29%
red tree voles	2.37	-14%	-10%	-10%	-25%



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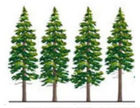
Assessing tradeoffs among land allocation scenarios

- Relative comparison with baseline scenario, showing raw numbers & color-coded % change

	2024				
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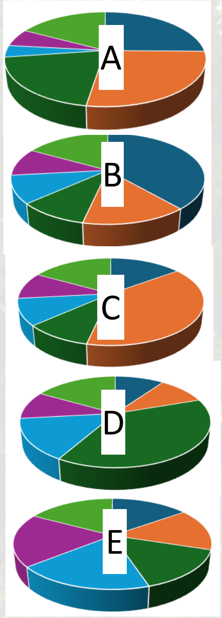
Biodiversity (avg across all taxa)	**1.58**	**1.41**	**1.41**	**1.30**	**1.17**
bees	0.88	0.77	0.87	0.77	0.71
early seral birds	1.17	0.95	1.17	0.93	0.81
late seral birds	2.09	1.92	1.77	2.26	1.73
ungulates	0.71	0.82	0.45	0.28	0.37
amphibian	2.26	1.93	2.04	1.90	1.61
red tree voles	2.37	2.05	2.14	2.13	1.78



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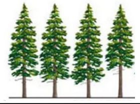
Four Questions for You

1. Which scenario do you find most preferable, and why?
2. Which scenario you find least preferable, and why?
3. Which additional land allocation scenario would you like to see explored in future modeling?
4. Which values do you consider most and least important for prioritization on the McDonald-Dunn Forest?

	2024				
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