# College Forest Updates: McDonald & Dunn Forest Management Planning Process

Spring 2022 – Fall 2024

**OSU College of Forestry**
**McDonald-Dunn Research Forest Faculty Planning Committee Meeting #22**
**316 Peavy Forest Science Center or Zoom (Join Zoom Meeting)**
**30 May 2024, 11am-1pm**

## Agenda

*Meeting Purpose:*

- Share information on recent and upcoming efforts and events
- Review the mechanics of the modeling process
- Examine the results of the modeling
- Plan for upcoming meetings

| Start Time | Activity |
|---|---|
| 11:00am | **Review where we've been and where we're going** |
| 11:05am | **Describe the modeling efforts intended to predict future forest conditions**<br>○ **Provide overview of the forest modeling process**<br>○ **Summarize the model input**<br>○ **Recount the metrics to be used to assess tradeoffs among land allocation scenarios** |
| 12:00pm | **Discuss the modeling results**<br>○ **Assess tradeoffs among scenarios**<br>○ **Investigate the advantages and drawbacks of each scenario**<br>○ **Plan how to structure the discussion at future gatherings so it's meaningful to non-technical experts** |
| 12:55pm | **Next steps** |
| 1:00pm | **Adjourn** |

# 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:**

- May 30, 2024, Faculty Planning Committee Meeting. Zoom link: https://oregonstate.zoom.us/j/94211576439?pwd=L0FONzErODhPbHVDaXJ3VmVpd1NTdz09 (open to the public to listen remotely

**Upcoming Meetings & Events:**

- May 30, 2024, Faculty Planning Committee Meeting. Zoom link: https://oregonstate.zoom.us/j/94211576439?pwd=L0FONzErODhPbHVDaXJ3VmVpd1NTdz09 (open to the public to listen remotely through Zoom but not comment, video will be posted afterwards)
- June 3, 2024, 9am-noon, Stakeholder Advisory Committee Meeting. Zoom link: https://pdx.zoom.us/j/85123309661 (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, Stakeholder Advisory Committee Meeting (agenda)
- Feb 22, Faculty Planning Committee Meeting, (agenda, presentation, video recording)

SUBMIT YOUR COMMENTS

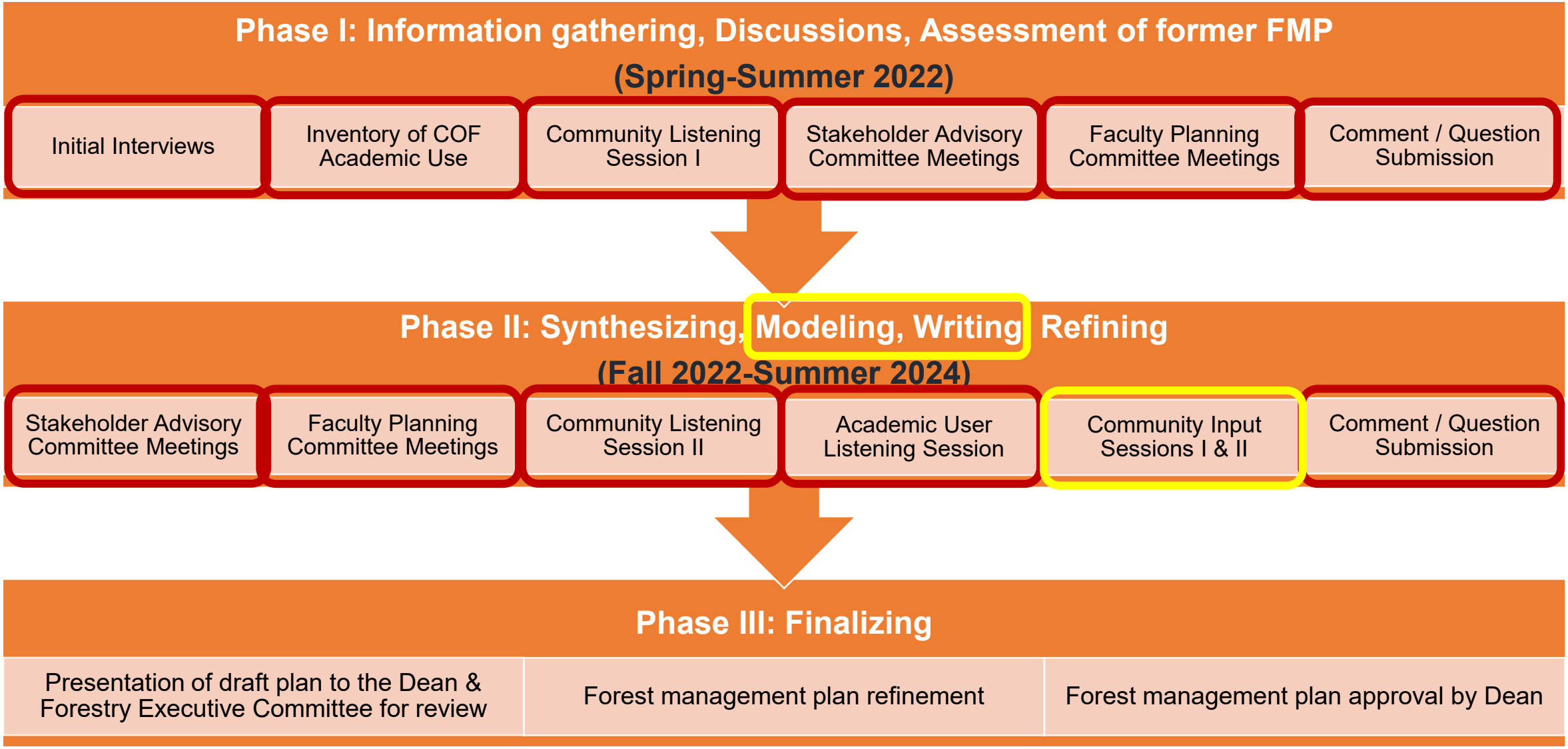
SUBMIT YOUR QUESTIONS

STAY CONNECTED

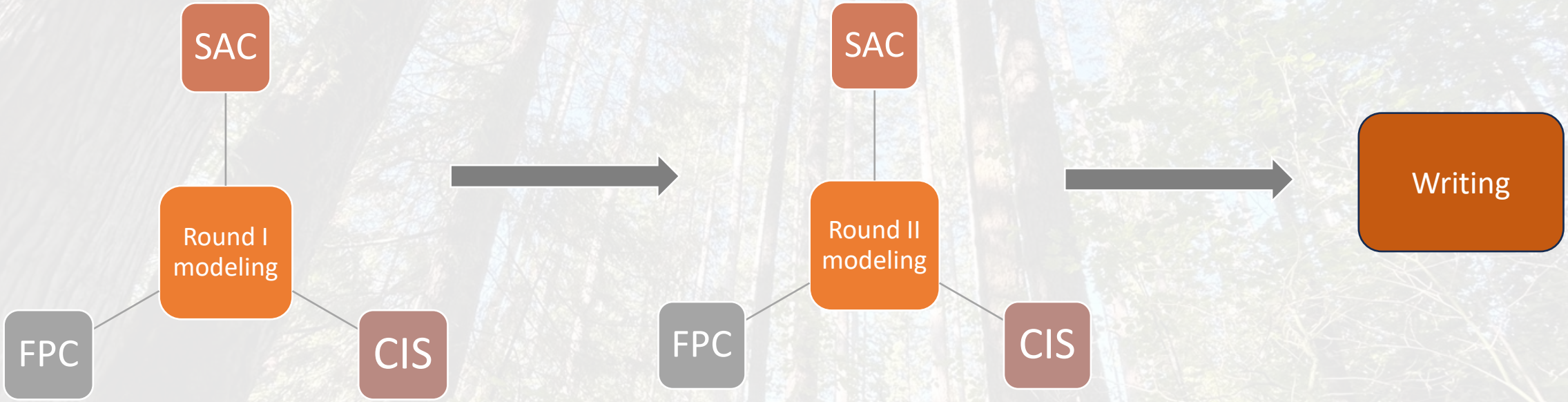
READ PUBLIC COMMENTS

HISTORIC DOCUMENTS - MCDONALD-DUNN RESEARCH FOREST PLANNING 2004-PRESENT

# McDonald-Dunn Research Forest Management Planning Process



# Anticipated Steps




- Writing: add details describing modeling methodology
- Writing: add details describing modeling results
- Writing: add details describing ultimate decisions regarding land allocation

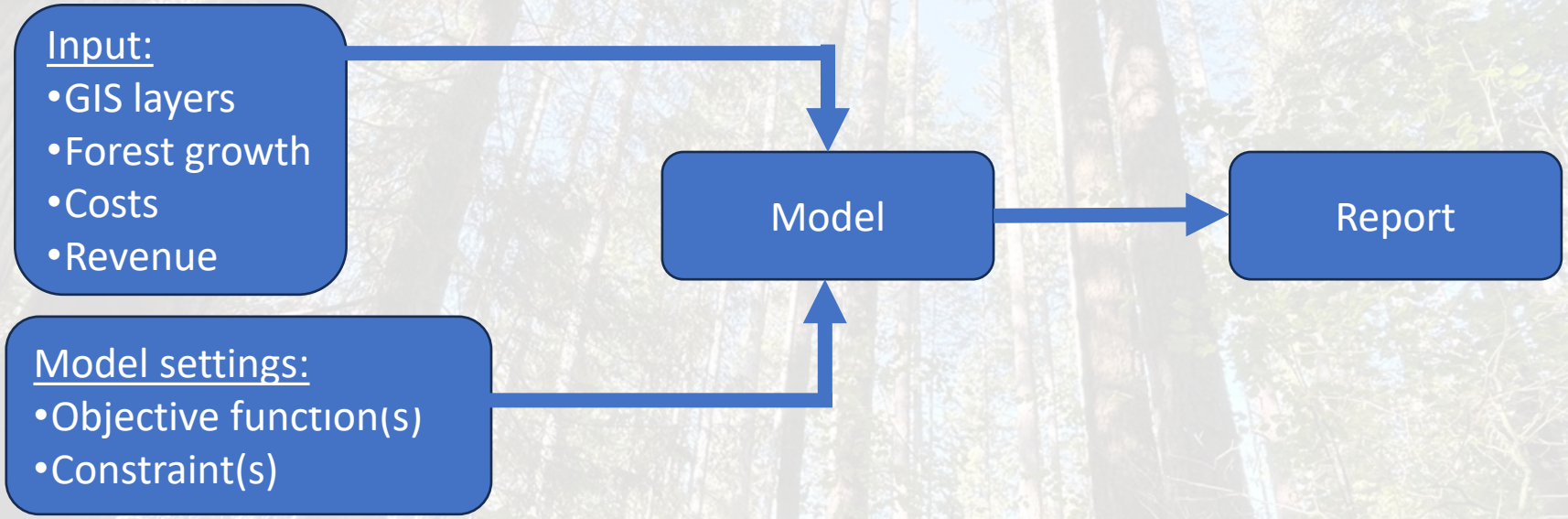
# What are talking about when we refer to ‘modeling’?

# What does forest ‘modeling’ refer to?

- Forest management is complex (managed over long time periods, unpredictable natural processes, diverse values associated with natural resources).
- Mathematical programming is a tool that can find solutions to complex problems (e.g., sustained yields of forest products, maintenance of specific acreages of particular forest conditions).
- Modeling allows us to make data-driven decisions. It simulates scenarios that we can then evaluate trade-offs.
- These analyses also help us optimize timelines and schedules.

# The basics of harvest schedule modeling

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

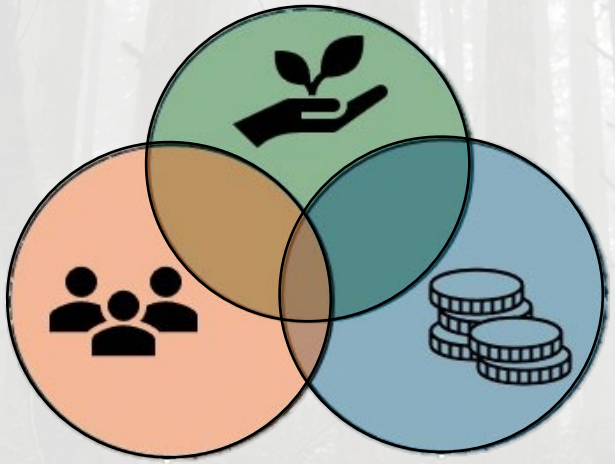


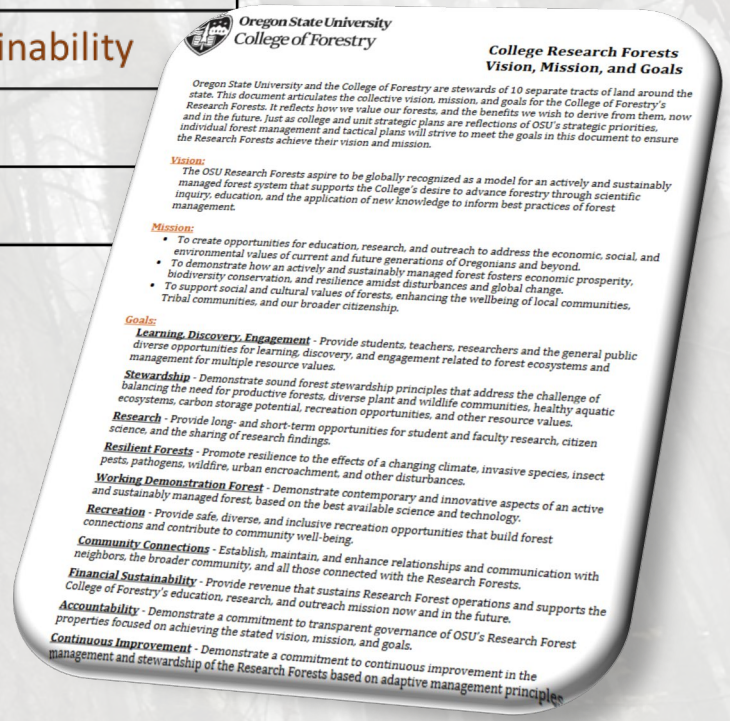

- The model attempts to find “optimal” solutions by assigning stands to management strategies
- Ability to dictate that specific stands are assigned to a particular “management strategy” (e.g., managed reserve)

# 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 | Resilient forests | Community connections |
| Stewardship | Working demonstration forest | Financial sustainability |
| Research | Recreation | 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.

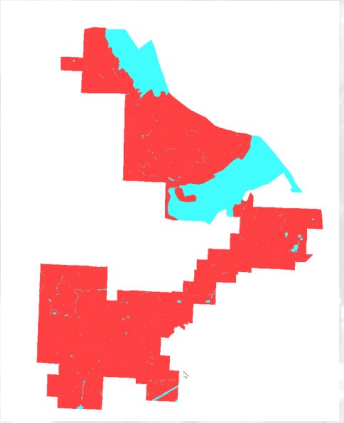
**Community Connections** - Establish, maintain, and enhance relationships and communication with neighbors, the broader community, and all those connected with the Research Forests.

**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
- We have 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)
- We must account for all the costs associated with management activities
  - Costs include the harvest, site prep, planting, interplanting, chemical release, subsequent thinning
  - Must consider type of harvest, as dictated by slope (e.g., ground, cable)
- We have ~90 stands devoted to long-standing research that cannot be compromised
- All this means that understanding the ramifications of land allocation decisions necessitates the model making hundreds of thousands of decisions

# What conditions do we intend to create on the forest?

# Recap: 5 ‘Forest Management Strategies’ for the new plan

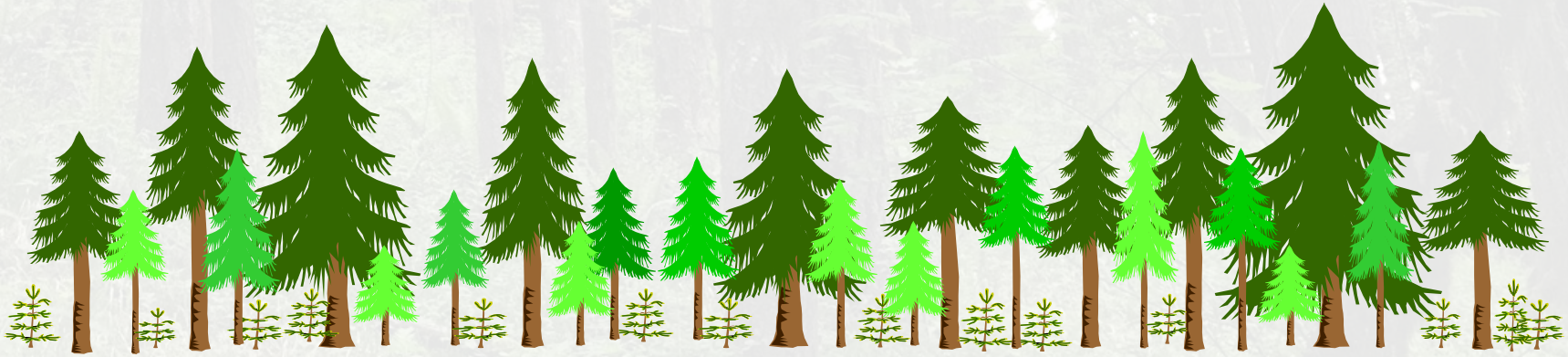
A. Even-aged, short rotation

B. Even-aged, long rotation

C. Multi-aged, multi-species

D. Managed reserves

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



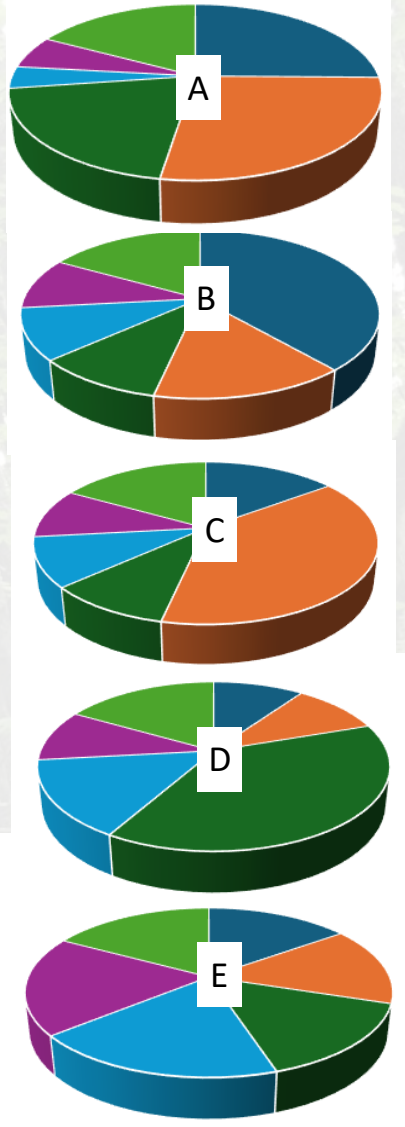
# Recap: Overview of each new 'Management Strategy'

| | Even-aged short rotation | Even-aged long rotation | Multi-aged multi-species | Managed reserves | Ecosystems of concern |
|---|---|---|---|---|---|
| **Overview** | 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). | 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 large-scale disturbances). | 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 for a variety of values. Multiple native tree species will be encouraged. These harvests will not exceed 40 acres. | 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 for a variety of values, 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. | Restoration and maintenance activities will be undertaken in native oak savanna/woodlands, meadows, and riparian/aquatic systems. Two strategies will be employed:<br>• retain and conserve the most at-risk and highest value components of ecological and cultural diversity, and<br>• use intensive efforts where needed to improve and restore broader ecological and/or cultural functions at specific sites. |

# What decisions will the model results help us make?

# Recap: Modeling of 5 Scenarios to Evaluate Tradeoffs

| | 2024 |  |  |  |  |
|---|---|---|---|---|---|
| **Proportion** | **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% |

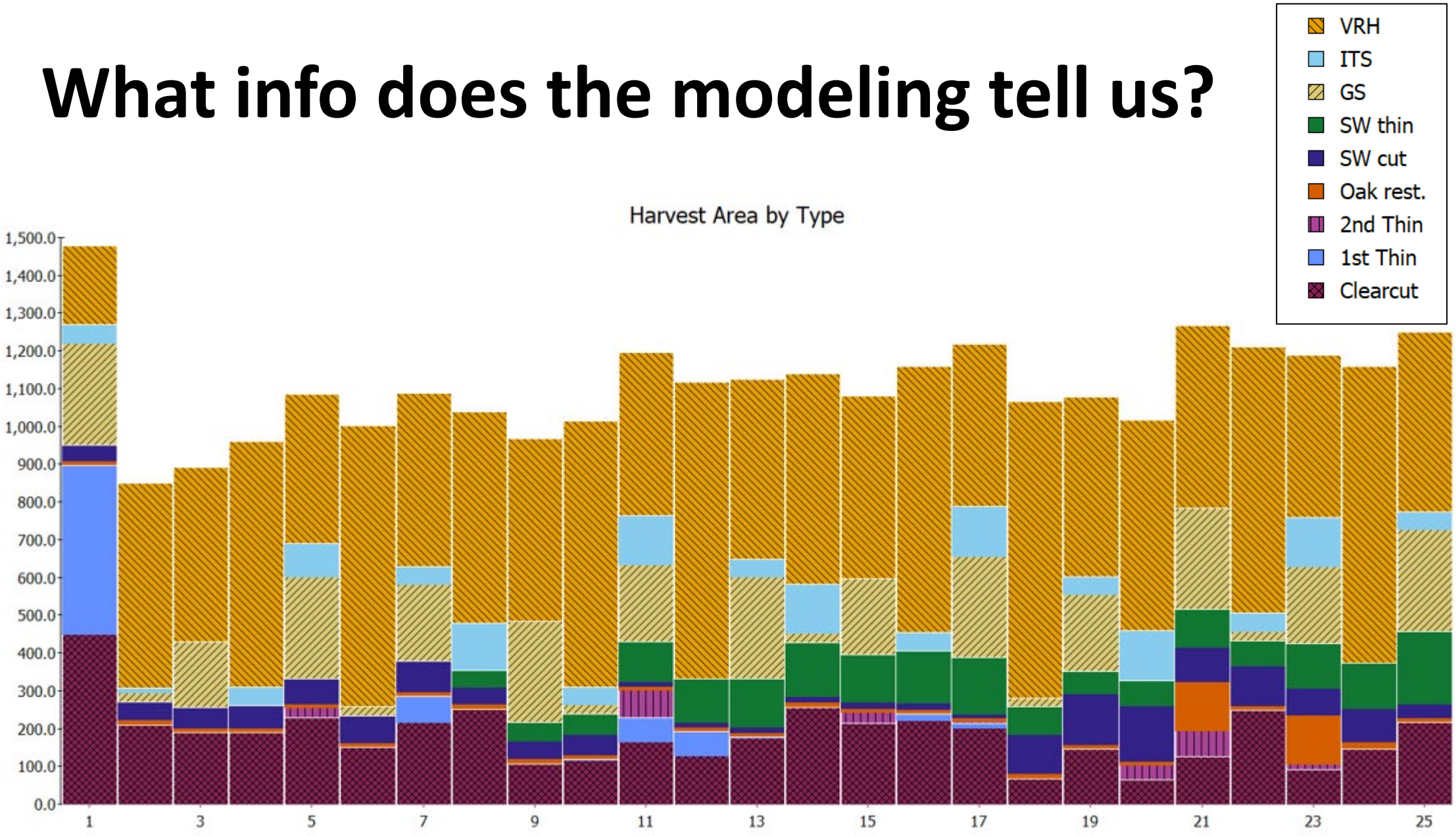



* long-term learning + non-forest = acreage unavailable for allocation because held for long-term research or roads, powerlines, lake, quarry, etc.

# 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)

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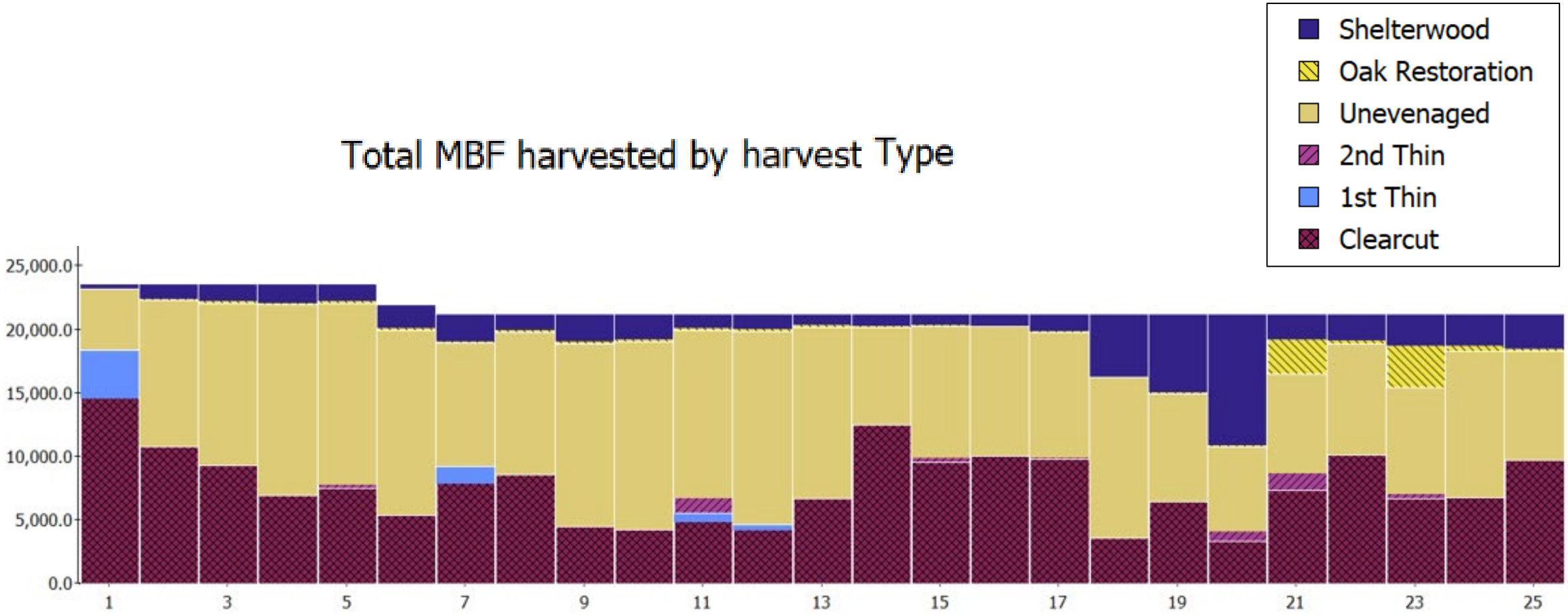

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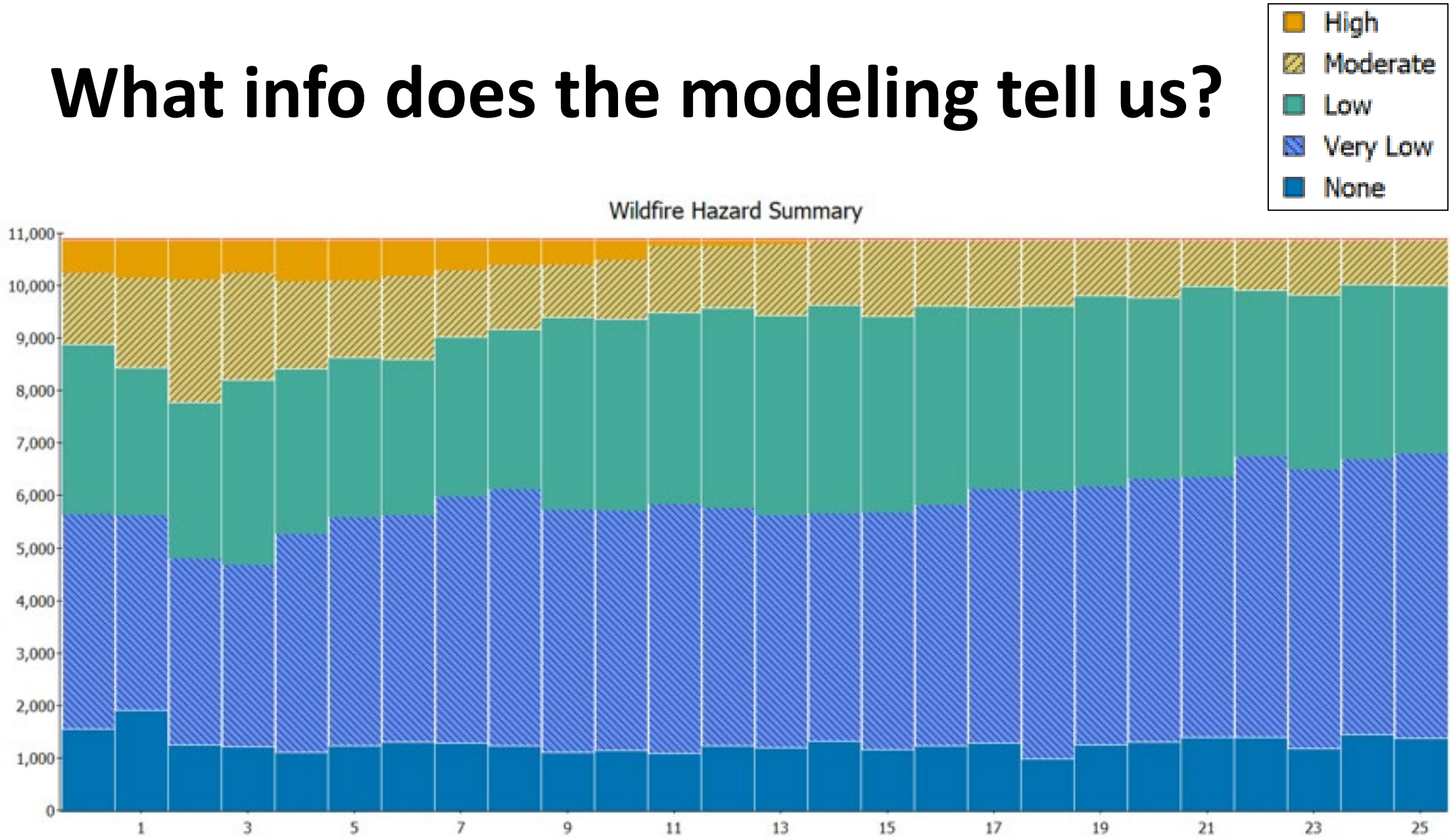
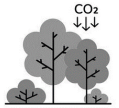
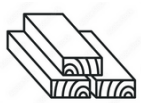
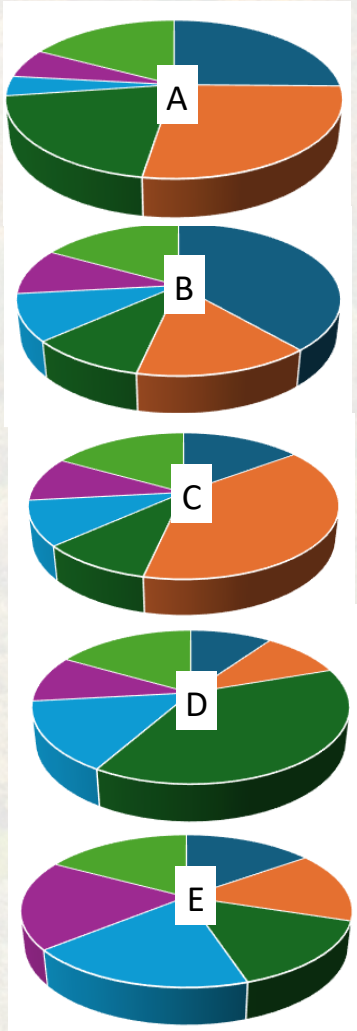


# How will we assess tradeoffs among the 5 land allocation scenarios?

2024

# How will we assess tradeoffs among scenarios?

| Forest Value | | What are we trying to measure? |
|---|---|---|
| Biodiversity |  | Habitat suitability of focal taxa (bees, early successional birds, late successional birds, red tree voles, ungulates, amphibians) |
| Carbon storage |  | Amount of carbon in live trees |
| 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 hazard |  | Degree of hazard from wildfire |



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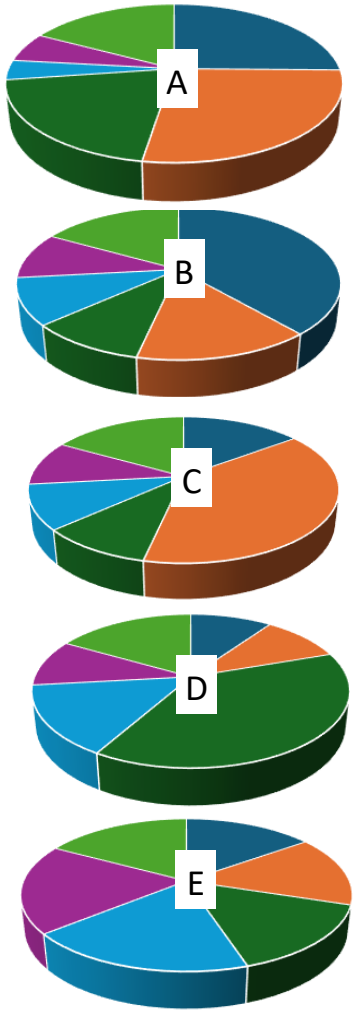
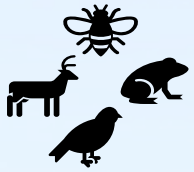


# Biodiversity

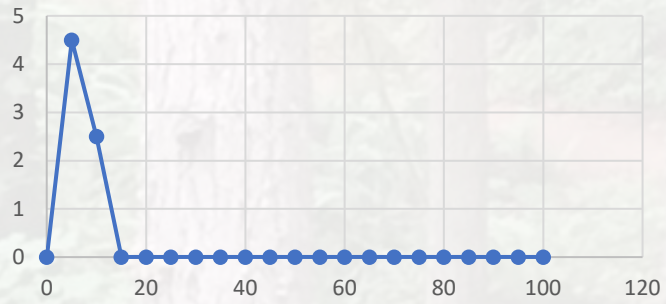


- Reflects habitat suitability of several focal taxa
- July 2023 meeting of 8 experts knowledgeable about forest-dependent wildlife to discuss potential approaches
- Decided to adopt approach described in Harris & Betts 2023
- Convened 6 groups of taxonomic experts to develop graphs describing habitat 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

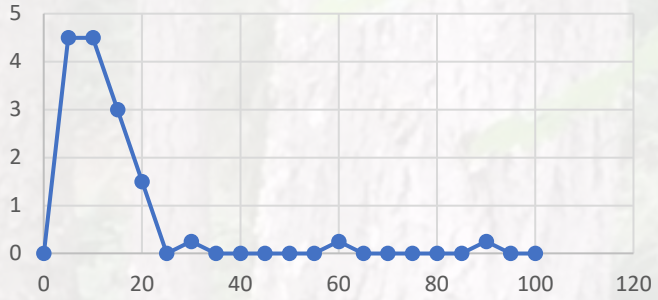
# Modeling Biodiversity

## - example data from an early-seral obligate taxa

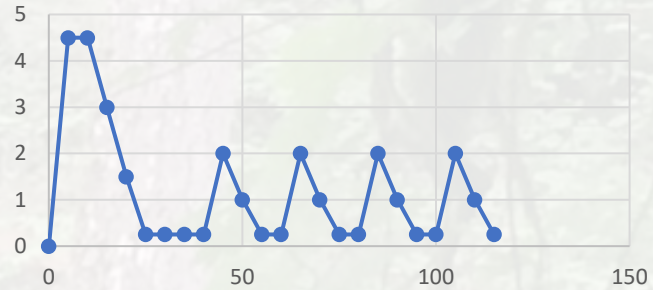
Even-aged short rotation



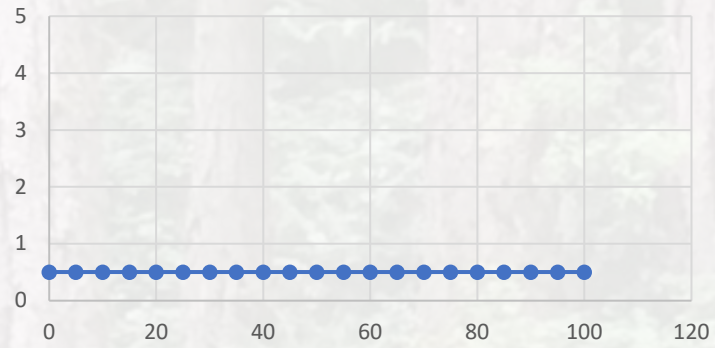

Even-aged long rotation



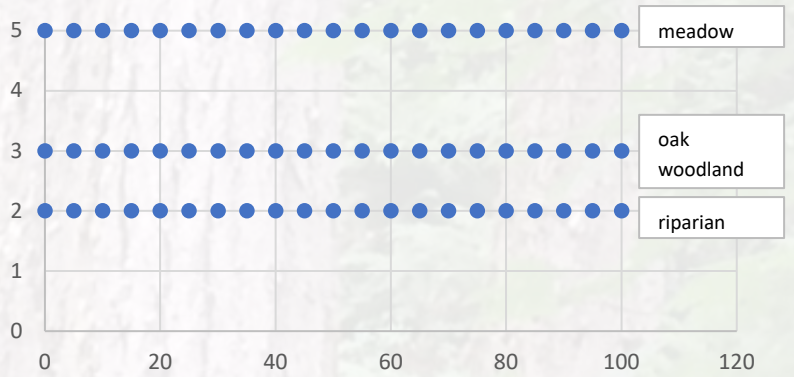

Multi-age multi-species



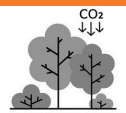

Managed reserve

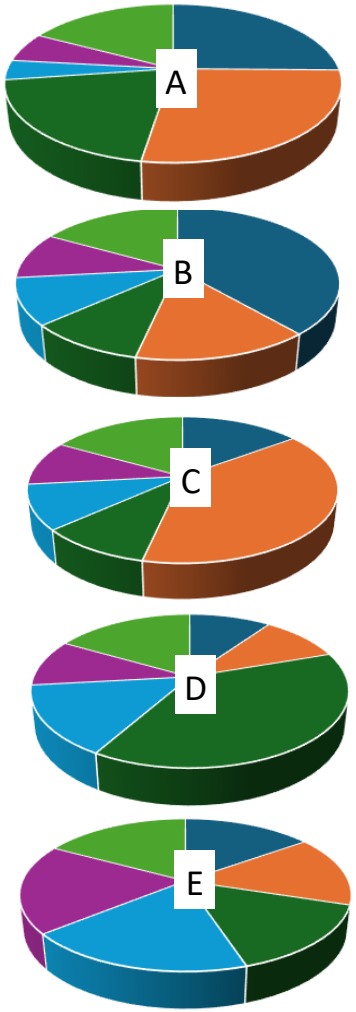



Ecosystems of concern

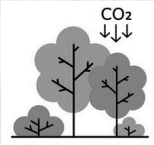


# How will we assess tradeoffs among scenarios?

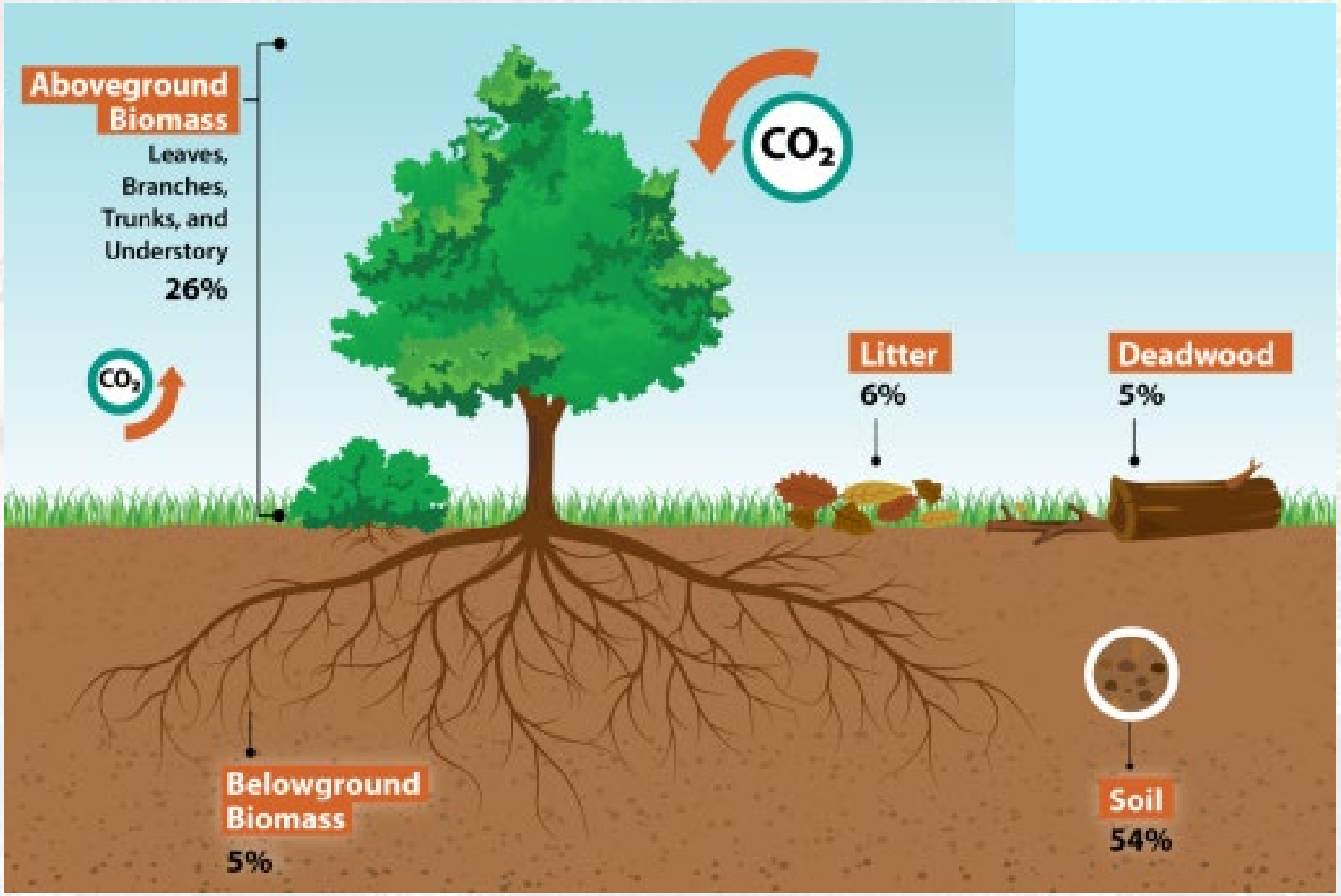
| Forest Value | | What are we trying to measure? |
|---|---|---|
| Carbon storage |  | Amount of carbon in live trees |



# Carbon storage




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



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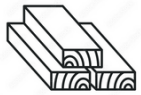
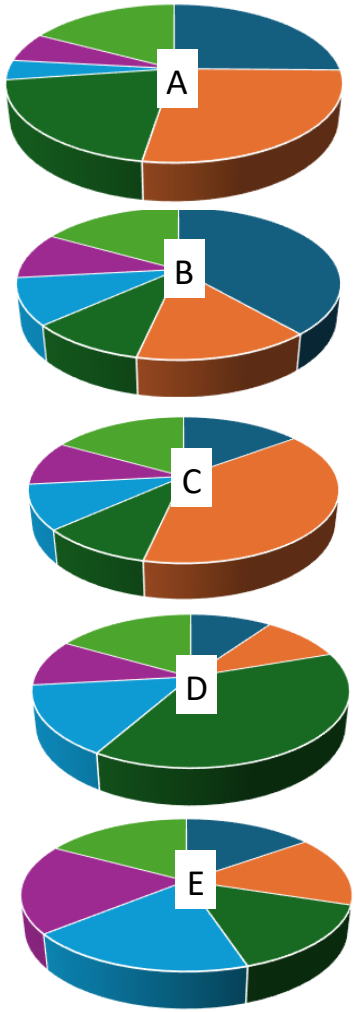
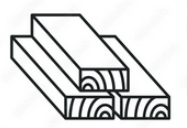
| Forest Value | | What are we trying to measure? |
|---|---|---|
| Forest products |  | Volume of timber harvested |



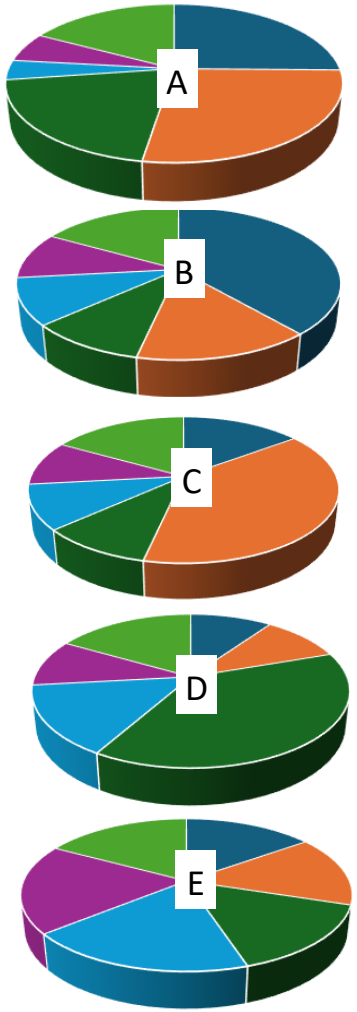
# Forest Products



- 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

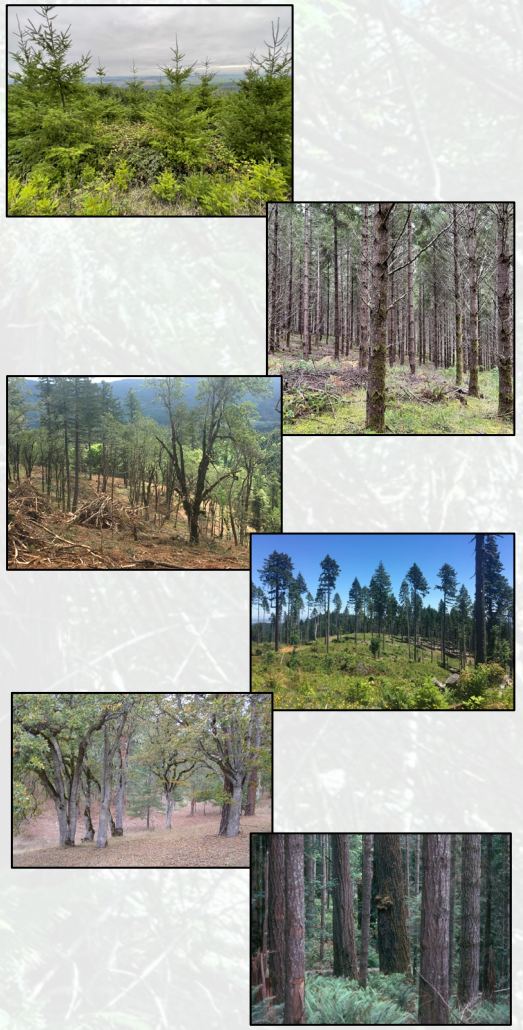
# How will we assess tradeoffs among scenarios?

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



# Recreation acceptability

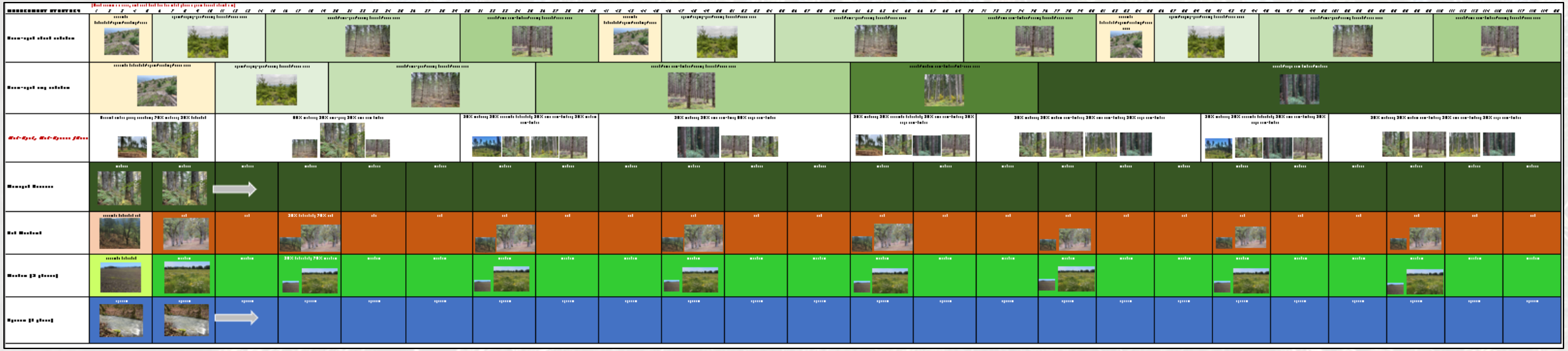
- A measure of forest condition preferences of recreational users of the forest
- Forest visitors were shown a series of 14 photos and asked to rate how acceptable each forest-scenic condition was in maintaining the quality of their recreational experience
- Ratings were on a scale of 1 to 5
  - 1 =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



# Recreation acceptability

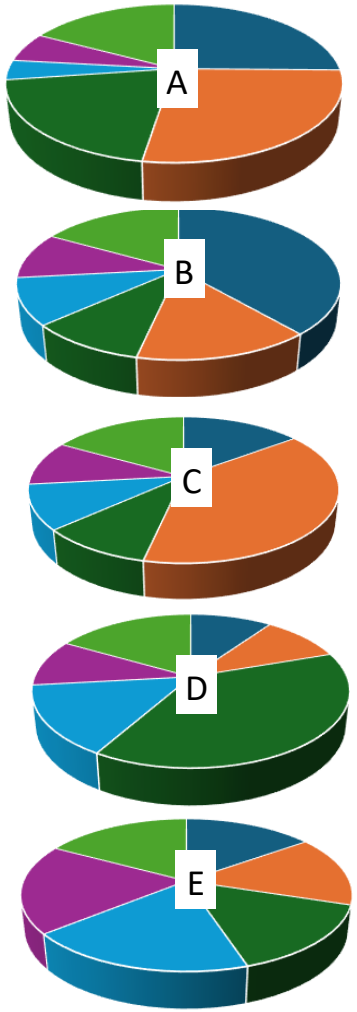
- We determined how many years would be spent in conditions depicted by each photo in each management strategy
- We scaled according to % of acreage in each scenario

| 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?

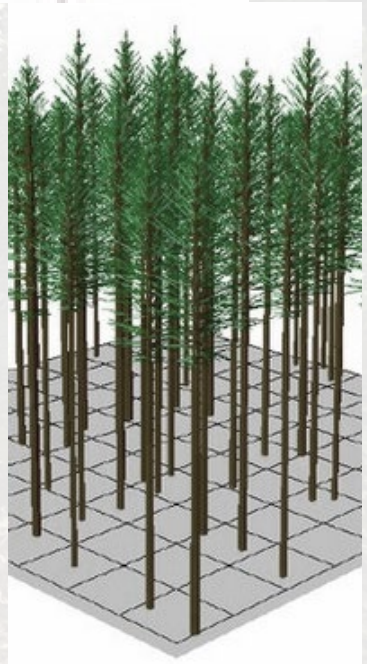
| Forest Value | | What are we trying to measure? |
|---|---|---|
| Resilience - density | | **Resilience as related to tree density and stand conditions** |



# Resilience - density

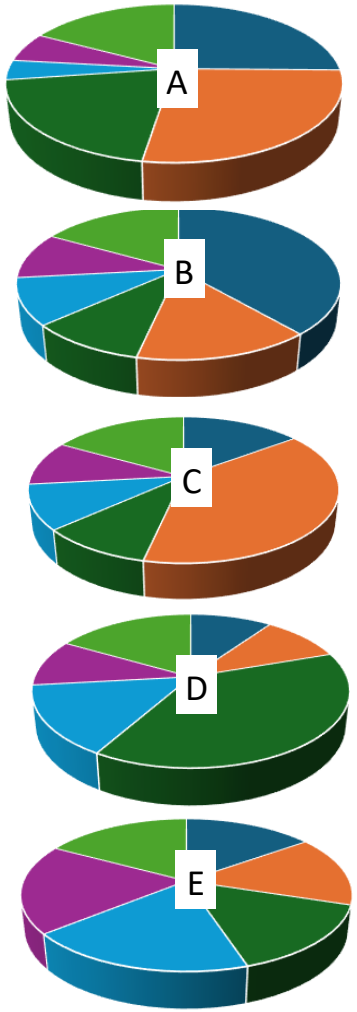
- A measure of tree density, derived as **stand density index** relative to **maximum possible stand density index** in the region
- Raw values could range from 0 to 100%, and were converted to scores of 0 to 5 to simplify interpretation
- Score interpretation – degree of stress resulting from competition

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



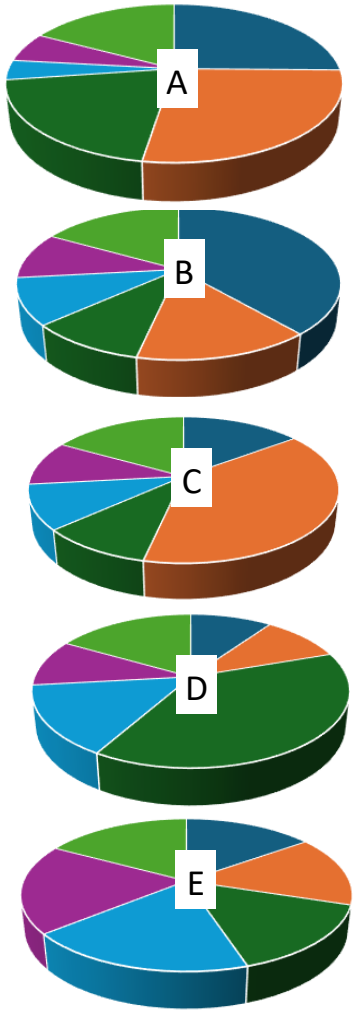
# Resilience - composition

- 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
- Higher scores (lower percentage values) indicate forests 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 |
|---|---|
| **0** | >40% |
| **1** | 30.01 – 40% |
| **2** | 20.01 – 30% |
| **3** | 10.01 – 20% |
| **4** | 0.01 – 10% |
| **5** | 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 |

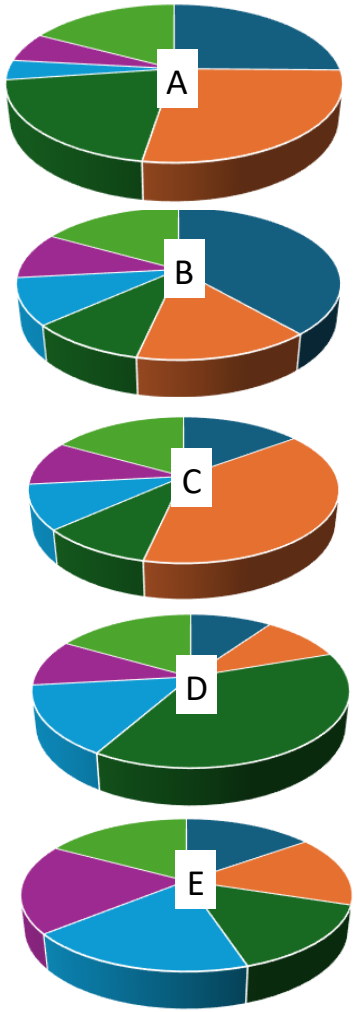


# Revenue - net

- 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, fire protection, research support

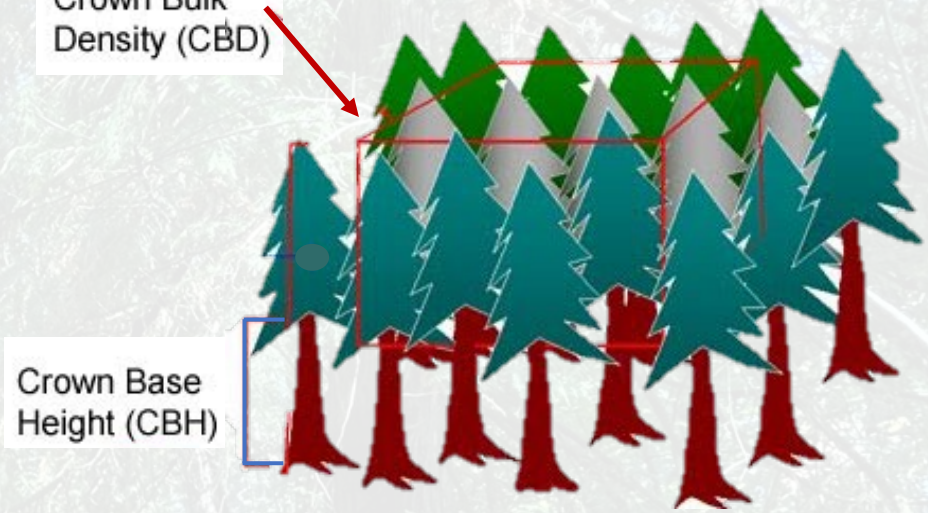
# How will we assess tradeoffs among scenarios?

| Forest Value | What are we trying to measure? |
| --- | --- |
| Wildfire hazard | Degree of hazard from wildfire |



# Wildfire hazard

- Comprised of 2 metrics
- **Canopy Bulk Density** (CBD) – *amount of canopy fuels*
  - the density of available canopy fuel in a stand
  - the mass of available canopy fuel per canopy volume unit
  - CBD influences rate of fire spread and likelihood of active crown fire
- **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 Hazard** = Sum Scores (CBD + CBH) after converting CBD and CBH scores from raw numbers to 0, 1, 2
  - Canopy bulk density
    - **0** = 0 - 0.065
    - **1** = 0.0651 – 0.13
    - **2** = > 0.13
  - Canopy base height
    - **0** = >20.0ft
    - **1** = 6.01 – 20.0ft
    - **2** = <6.0ft

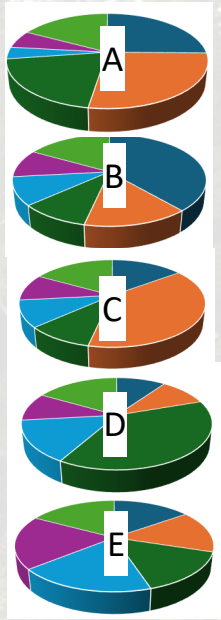
| Score | Interpretation |
|---|---|
| **0** | Very low wildfire hazard |
| **1** | Low wildfire hazard |
| **2** | Moderate wildfire hazard |
| **3** | High wildfire hazard |
| **4** | Very high wildfire hazard |

# Let’s assess tradeoffs among the 5 land allocation scenarios

# Assessing tradeoffs among land allocation scenarios

- Relative comparison with baseline scenario, showing 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 | -- | -- | -- | -- |
| Carbon storage | 1,033,578T | + | + | +++ | ++ |
| Forest products | 30MMBF | -- | -- | -- | -- |
| Net revenue | $9.6 Mil | -- | -- | -- | --- |
| Recreation acceptability | 3.42 | + | + | + | + |
| Resilience - density | 2.45 | + | + | ++* | ++* |
| Resilience - composition | 3.41 | - | - | - | - |
| Wildfire hazard | 1.32 | no change | + | ++* | + |



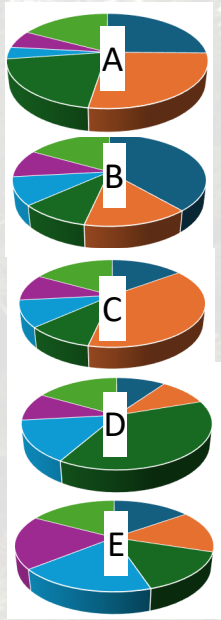

| |
|---|
| Considerable increase (>50% increase or +++) |
| Modest increase (10-50% increase or ++) |
| Little change (10% increase – 10% decrease or +, -) |
| Modest decrease (10-50% decrease --) |
| Considerable decrease (>50% decrease or ---) |

*Note that modest increases in resilience-density and wildfire hazard are coded as orange to denote that these are trending toward undesirable conditions.

# 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% |
| Carbon storage | 1,033,578T | +9% | +10% | +55% | +41% |
| Forest products | 30MMBF | -15% | -12% | -28% | -36% |
| Net revenue | $9.6 Mil | -26% | -22% | -39% | -58% |
| Recreation acceptability | 3.42 | +1% | +2% | +5% | +5% |
| Resilience - density | 2.45 | +5% | +9% | +50%* | +38%* |
| Resilience - composition | 3.41 | -1% | -1% | -9% | -8% |
| Wildfire hazard | 1.32 | no change | +2% | +14%* | +10% |




| |
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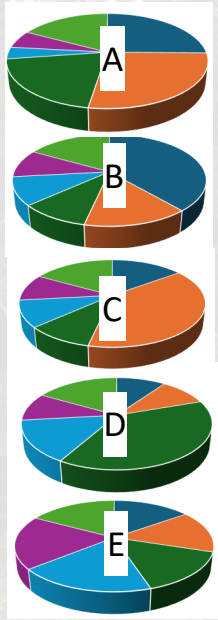
| Modest decrease (10-50% decrease --) |
| Considerable decrease (>50% decrease or ---) |

*Note that modest increases in resilience-density and wildfire hazard are coded as orange to denote that these are trending toward undesirable conditions.

# 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 |
| Carbon storage | 1,033,578T | 1,121,824T | 1,134,613T | 1,597,314T | 1,456,981T |
| Forest products | 30MMBF | 25MMBF | 26MMBF | 22MMBF | 19MMBF |
| Net revenue | $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 | 2.45 | 2.58 | 2.66 | 3.67* | 3.38* |
| Resilience - composition | 3.41 | 3.38 | 3.39 | 3.09 | 3.15 |
| Wildfire hazard | 1.32 | 1.32 | 1.34 | 1.51* | 1.45 |




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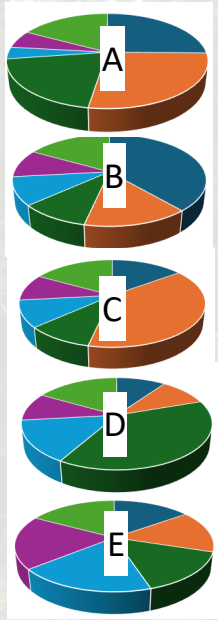
| Little change (10% increase – 10% decrease or +, -) |
| Modest decrease (10-50% decrease --) |
| Considerable decrease (>50% decrease or ---) |

*Note that modest increases in resilience-density and wildfire hazard are coded as orange to denote that these are trending toward undesirable conditions.

# 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% |




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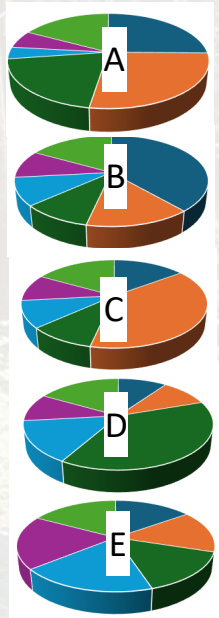
| Little change (10% increase – 10% decrease or +, -) |
| Modest decrease (10-50% decrease --) |
| Considerable decrease (>50% decrease or ---) |

# Request for Input from SAC and Community

- Three questions:
  - **Which scenario do you find most preferable, and why?**
  - **Which scenario you find least preferable, and why?**
  - **Which additional land allocation scenario you would like to see explored in future modeling?**

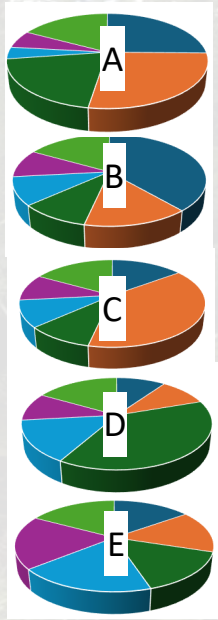
| | 2024 | | | | |
|---|---|---|---|---|---|
| **Forest Value** | **Scenario A (baseline)** | **Scenario B (lots of EASR)** | **Scenario C (lots of EALR)** | **Scenario D (lots of MAMS)** | **Scenario E (lots of MR & EOC)** |
| Biodiversity (avg across all taxa) | 1.58 | 1.41 | 1.41 | 1.38 | 1.17 |
| Carbon storage | 1,033,578T | 1,121,824T | 1,134,613T | 1,597,314T | 1,456,981T |
| Forest products | 30MMBF | 25MMBF | 26MMBF | 22MMBF | 19MMBF |
| Net revenue | $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 | 2.45 | 2.58 | 2.66 | 3.67* | 3.38* |
| Resilience - composition | 3.41 | 43.38 | 3.39 | 3.09 | 3.15 |
| Wildfire hazard | 1.32 | 1.32 | 1.34 | 1.51* | 1.45 |



# 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 | 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 |

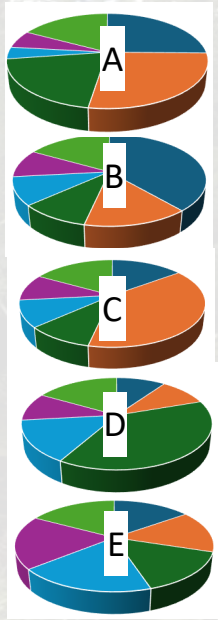



| |
|---|
| Considerable increase (>50% increase or +++) |
| Modest increase (10-50% increase or ++) |
| Little change (10% increase – 10% decrease or +, -) |
| Modest decrease (10-50% decrease --) |
| Considerable decrease (>50% decrease or ---) |

# 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 | 1.30 | 1.17 |
| bees | 0.88 | -- | - | -- | -- |
| early seral birds | 1.17 | -- | no change | -- | -- |
| late seral birds | 2.09 | - | -- | + | -- |
| ungulates | 0.71 | ++ | -- | --- | -- |
| amphibian | 2.26 | -- | -- | -- | -- |
| red tree voles | 2.37 | -- | - | -- | -- |

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| 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 ---) |

# How would you like to proceed?

- Provide your input on scenarios now or wait until after SAC and community has weighed in (June 6 or 7 or beyond)?
- Provide suggestions on changes or additions to questions that are asked at the SAC meeting and Community Input Session?
- When would you like to begin reviewing and revising written material (prior to final scenario selection or after)?