**Managing Oregon’s Forests Together**

**LaCuKnoS Teacher Page (for MS and HS)**

**Lesson Objective(s)**

After completing this lesson students will be able to make decisions about how to manage different forest units that address competing demands, such as maintaining biodiversity, meeting wood processing needs, and reducing risk of forest fires.

**NGSS Standards for Middle School:**

· MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

· MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

**NGSS Standards for High School:**

· HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

· HS-ETS1-3. Evaluate a solution to a complex real-word problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

**Lesson Description**

This lesson is divided into two class period sessions. Session 1 scaffolds basic knowledge about the role of landowners and foresters and discusses forest management options using the jigsaw instructional strategy. Session 2 builds on previous gathered knowledge and allows students to develop and present their forest management plans using a claim-evidence-reasoning format.

**LaCuKnoS Practice(s) being highlighted:**

L1: Choosing language registers based on topic, purpose & audience

C1: Purposeful student grouping to connect science, culture and language goals

K1: Shared experiences with relevant phenomena as basis for how science knowledge is built and accepted

**LaCuKnoS Tools used in lesson:**

In this lesson we use five LaCuKnoS tools:

* Language Booster (tool L1-1)
* Investigation Summary Template (tool L1-2)
* Multilingual Concept Cards (tool L1-3)
* Investigation Role Cards (tool C1-1)
* Shared Anchoring Event (tool K1-1)

**Language Boosters** (tool L1-1) - LaCuKnoS Language Boosters are short (1-2 page), high interest science readings that provide a “hook” to engage students, a conceptual overview of the investigation topic, introduce some key concepts that will be fundamental to the investigation, and make a connection between the ideas to be learned and related experiences that students may have had in some context outside of the classroom. The Language Booster closes with 2 or 3 questions or prompts to guide students’ oral and written reflections with a partner.

**Investigation Summary Template** (tool L1-2) - LaCuKnoS investigation guides end with an investigation summary template that encourages students to think, talk, and write with a partner about how they used science and engineering practices in the investigation. They practice using multiple registers to explain what they learned to two different audiences (e.g., Explain the main idea you learned in language that your 2nd grade cousin would understand; Explain the main idea you learned in language that your science teacher might use to describe it.)

**Multilingual concept cards** (tool L1-3) – LaCuKnoS concept cards define and explain a limited number (3 to 6) of important concepts, which are mentioned and highlighted in bold in the investigation -- often in the *Language Booster*. These cards provide the name, a brief “student friendly” definition and a picture of the concept, using both English and Spanish. The cards can be used flexibly, such as at the start of the lesson, as part of a word wall, to review in lab groups, or introduced as needed when working with the investigation.

**Investigation role cards** (tool C1-1) – LaCuKnoS investigation role cards provide a structure to help students use science investigation practices and language for science in meaningful and productive ways. The forestry lesson uses role cards to provide information about roles and questions that are specific to the given LaCuKnoS investigation. The two roles are:

Landowner – own the land

Forester – play a key role in providing resources and information to landowners to help them manage and protect these valuable resources

**Shared anchoring event (with community relevance)** (tool K1-1) – LaCuKnoS anchoring events are events or processes that require students to bring together multiple ideas to explain. These events help students see the relationships between *natural phenomena* and *causal explanations.* Anchoring events should be context-rich, meaning that it is about a *specific* event that happens in a *specific* place and time under *specific* conditions (place based). When possible, there should be direct community relevance.

**Concepts for Concept Cards**

* conifer/conífera
* crown/copa
* silviculture (forestry) /silvicultura
* thinning/raleo
* shade tolerant/tolerante a la sombra

**Materials needed**

* Lesson plan
* Introductory presentation (optional)
* Concept cards
* Language booster
* W0odland property map and description
* Investigation role cards
* Expert group supplementary materials
* Forestry management plan graphic organizer
* Investigation Summary Template

**Advance Preparation:**

Review the lesson plan and introductory presentation.

Provide connection to current lesson or current event to make it relevant to students.

Have all materials ready including copies of handouts.

Think about intentional grouping strategies.

**Safety Recommendations:**

Our science investigations are designed to be kid-friendly and in most cases use everyday materials that are not considered to be dangerous. However, it is important for you to assess potential risks or safety concerns in your particular setting when you teach this science investigation.

**Other Recommendations:**

This lesson pairs nicely with a walking “field trip”. If you have some trees on the school grounds or close by, students can reflect on the management decisions they are making as they consider some actual trees.

**Managing Oregon’s Forests Together**

**Lesson Plan**

*Before the lesson:*

* Show forestry career video to students: [https://www.youtube.com/watch?v=IDBfSV-Kipk&t=134s](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DIDBfSV-Kipk%26t%3D134s&data=04%7C01%7C%7C8cd33db4efe24c8c302608d937ede6bb%7Cce6d05e13c5e4d6287a84c4a2713c113%7C0%7C0%7C637602317195033146%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=SEheC5Z3kooS1hb%2BqV08k8Hhzus14RH%2F2%2FeVFUjiSr0%3D&reserved=0)

*Session 1--Introduction and expert groups:*

* Provide students with the language booster. Have students read the language booster. This can be done as a class, in pairs, or individually.
* Have students get into pairs and discuss the language booster and answer the two associated questions.
* After students have had time to think about the language booster questions allow time for student pairs to share out with the rest of the class.
* Lesson introduction--PowerPoint provided--should include the language booster (*Managing Oregon Forests Together*) and necessary background information to complete the lesson.
* Put students into groups of four, thinking about intentional grouping. This will be the students “home” group.
* Ask students in their groups to choose an expert role to play during the lesson. Each group of four students will have two “Foresters” and two “Woodland Landowners”. These roles represent the students’ “expert” group. Half the class needs to be in each of the groups.

Woodland landowner: a private individual who just inherited forest land and does not have a forestry background.

Forester: an individual who has forestry expertise and has helped other woodland landowners create management plans.

* Provide each student a role card according to their expert group that will help guide them in their discussions with their expert and home groups.
* Provide the map and description of the woodland property to the student groups. From the introductory PowerPoint, the students know that they will be working together to determine the forest management plan for this woodland property.
* Students move from their home groups to their expert groups. Logistics tip--To increase participation keep expert groups to six students. Depending on class size you will most likely need to make multiple expert groups for both the Foresters and Woodland Landowners. Make sure that the Foresters and Woodland Landowners from each home group are in the same expert group.
* When students are in their expert groups they should:
  + Review the role cards (pgs. 14-15).
  + Review the provided expert group background information (pgs. 16-19) and supplemental information (pgs. 20-21). This information is unique to the expert groups and is helpful in expert groups understanding their role and developing their forest management options.
  + Using the prompts on the role card tents expert groups should work together to determine options for forest management of the woodland property.
* During expert group time, teachers should be visiting each group and supporting them through questioning. Some questions that teachers could use to do this are:
  + What are some of the benefits of restoring Oak savannas?
  + What are some of the drawbacks?
  + What role do woodland landowners and foresters play in managing and sustaining our forest ecosystems?
  + How does/could foresters and the Department of Forestry support woodland landowners in sustaining natural habitats such as the Oak savannas?
  + What are the benefits of producing timber?
* Students should leave expert groups with a good understanding of their role as experts and with options in mind for each forest management Unit.
* Expert Group Exit Ticket (pg. 22): In a paragraph students summarize their role and options for forest management of the woodland property. These exit tickets should be reviewed by the teacher to determine that students are ready to return to their home groups and prepare their forest management plan. These exit tickets can be provided to students at the beginning of class period 2 to remind them of their role and forest management options so they are more productive when they go to their home groups.

*Before class period 2:*

* Review student exit tickets to determine if students have a good understanding of their expert roles and are ready to develop their forest management plans in their home groups.
  + If they do continue to class period 2.
  + If they do not allow students to spend more time in their expert groups and provide individual group support.

*Class Period 2--Developing and presenting forest management plans:*

* Provide students with one or more focus questions. These question(s) will help focus students to the main lesson objectives.
  + What role do woodland landowners and foresters play in managing and sustaining our forest ecosystems?
  + How does/could foresters and the Department of Forestry support woodland landowners in sustaining natural habitats such as the Oak savannas?
* Provide students with the exit tickets that summarize their expert role that they completed at the end of class period 1. Have students review their exit tickets individually.
* Allow students to get back in their expert groups and ask questions of the other group members. If there are not any questions, have the students get into their home groups.
* Students should now return to their home groups as either woodland landowner or forester experts.
* In their home groups students share out to each other what they learned in their expert groups. This can be facilitated by the provided prompts in the role cards (pgs. 14-15).
* After sharing their expert perspectives the group should work together to make a forest management plan for the woodland property using the provided claim, evidence, and reasoning graphic organizer (pgs. 23-25).
* Once all groups have completed their forest management plans they should prepare to present them to the class or if there is not enough time to at least one other group.
* After all groups have had a chance to present their forest management plan the teacher should facilitate a class discussion that highlights the different management options selected by the groups. To help facilitate that discussion teachers can use the questions below:
  + What information do woodland landowners and foresters need to make decisions about tree planting and harvesting?
  + What factors contribute to the biodiversity of different types of forest?
  + What are some of the benefits of restoring Oak savannas?
  + What are some of the drawbacks?
  + What role do woodland landowners and foresters play in managing and sustaining our forest ecosystems?
  + How does/could foresters and the Department of Forestry support woodland landowners in sustaining natural habitats such as the Oak savannas?
* Exit ticket/homework: Student step out of their expert role and discuss and complete the investigation summary (pg. 26):

Extensions:

* “Woodland Sticks”

**The Woodland Stick and volume calculation**

The first step of a management plan is to gather information about what is in the property. This includes a description of the vegetation, soil, streams, road networks, wildlife and many others. In order to make management decisions and factor-in the economics, it is key to have a good idea of the species that are present, the age of the trees and have a volume estimation.

Depending on the size of a woodland property, the owner’s involvement, as well as familiarity with forestry, determining volume can be either performed by a specialized consulting forester or can be done by the landowner. If high accuracy is needed, a consulting forester is the best option, but if a landowner wants to use the information to write their management plan or make management decisions, there are different tools landowners can use to accomplish this task. One of these tools is the Woodland Stick.

The Woodland Stick utilizes a system based on a number named “tarif” to determine volume, the tarif number is a representation of the tree’s taper, determined by tree DBH (diameter at breast height or 4.5 ft) and total height. A tree with a small tarif number is more tapered than a tree with a larger tarif number. What makes this system popular, is the fact that it only relies on two measurements (tree height and DBH) to estimate volume.

Oregon utilizes the Scribner volume, which is a log rule to make transactions in the timber industry, the tarif number can be used to determine both cubic volume as well as Scribner volume. But understanding the Scribner log rule requires comprehension of the way timber is processed at the sawmill.

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**LaCuKnoS Concept Cards**

| **conifer/conífera** |
| --- |
|  |
| one variety of [evergreen](https://dictionary.cambridge.org/us/dictionary/english/evergreen) [tree](https://dictionary.cambridge.org/us/dictionary/english/tree) (one that never [loses](https://dictionary.cambridge.org/us/dictionary/english/lose) [its](https://dictionary.cambridge.org/us/dictionary/english/its) [leaves](https://dictionary.cambridge.org/us/dictionary/english/leaves)) that [produce](https://dictionary.cambridge.org/us/dictionary/english/produce) hard oval-shaped [fruit](https://dictionary.cambridge.org/us/dictionary/english/fruit) called [cones](https://dictionary.cambridge.org/us/dictionary/english/cone) |
| una variedad de árbol de hoja perenne (uno que nunca pierde sus hojas) que produce frutos duros de forma ovalada llamados conos |
|  |
| ["Douglas Fir Forest"](https://www.flickr.com/photos/100953877@N07/10334942653) by [OregonCavesNPS](https://www.flickr.com/photos/100953877@N07) is licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/?ref=ccsearch&atype=rich) |
| Concept Card |

| **crown/copa** |
| --- |
|  |
| part of a tree composed of branches and stem above the lowest live limb |
| parte de un árbol compuesto por ramas y tallo por encima de la rama viva más baja |
|  |
| ["Oak Tree Crown"](https://www.flickr.com/photos/9800999@N08/46089390634) by [deanwampler](https://www.flickr.com/photos/9800999@N08) is licensed under [CC BY-NC-ND 2.0](https://creativecommons.org/licenses/by-nc-nd/2.0/?ref=ccsearch&atype=rich) |
| Concept Card |

| **silviculture (forestry) /silvicultura** |
| --- |
|  |
| Management of the planting, growth, and health of forests and woodlands to meet the diverse needs and values of woodland landowners and society |
| manejo de la plantación, el crecimiento y la salud de los bosques y las tierras boscosas para satisfacer las diversas necesidades y valores de los propietarios y la sociedad |
|  |
| ["2015. Instructor Greg Filip. Advanced Insect and Disease Field Session: Identification, Life Cycles, Control Measures and Silvicultural Regimes. Gifford Pinchot National Forest, Washington."](https://www.flickr.com/photos/151887236@N05/41009222974) by [USDA Forest Service](https://www.flickr.com/photos/151887236@N05) is marked with [CC PDM 1.0](https://creativecommons.org/publicdomain/mark/1.0/?ref=ccsearch&atype=rich) |
| Concept Card |

| **thinning/raleo** |
| --- |
|  |
| the removal of some trees or parts of trees, to make room for the growth of others |
| la eliminación de algunos árboles o partes de árboles, para dejar espacio para el crecimiento de otros |
|  |
| ["Cut-to-length harvester in red pine"](https://www.flickr.com/photos/7357861@N03/452446852) by [esagor](https://www.flickr.com/photos/7357861@N03) is licensed under [CC BY-NC 2.0](https://creativecommons.org/licenses/by-nc/2.0/?ref=ccsearch&atype=rich) |
| Concept Card |

| **shade tolerant/tolerante a la sombra** |
| --- |
|  |
| able to grow in conditions with less sun |
| capaz de crecer en condiciones con menos sol |
|  |
| ["Stand re-initiation of shade-tolerant spruce and fir beneath a closed canopy of lodgepole pine. LP2 cover type where the forest is ~150-200 yrs in age post-disturbance on shoreline of West Thumb."](https://www.flickr.com/photos/80223459@N05/48349720361) by [YellowstoneNPS](https://www.flickr.com/photos/80223459@N05) is marked with [CC PDM 1.0](https://creativecommons.org/publicdomain/mark/1.0/?ref=ccsearch&atype=rich) |
| Concept Card |

**Managing Oregon’s Forests Together**

**LaCuKnoS Language Booster**



What do you think of when you think about forests? Do you think about wood products made from trees? Do you think about peaceful, shady walks for sightseeing or for exercise? Do you think about a natural resource that is renewable and sustainable if managed well, or one that could gradually disappear if managed poorly? Do you think about clean, breathable air that forests help produce? Do you think about jobs and economic opportunities tied to forests? For many Oregonians today, the first thing that may come to mind is the danger and destruction caused by forest fires.

During the September 2020 wildfires, more than one million acres burned in Oregon, about 500,000 Oregonians were under evacuation warnings and 40,000 had to evacuate their homes. Numerous cities and towns were blanketed with smoke, causing dangerous air quality that continued for days. These fires were fueled by drought, hot weather, and a high-wind event. Unfortunately, these conditions are becoming more common in Oregon, so we are likely to experience more severe wildfires in the coming years.

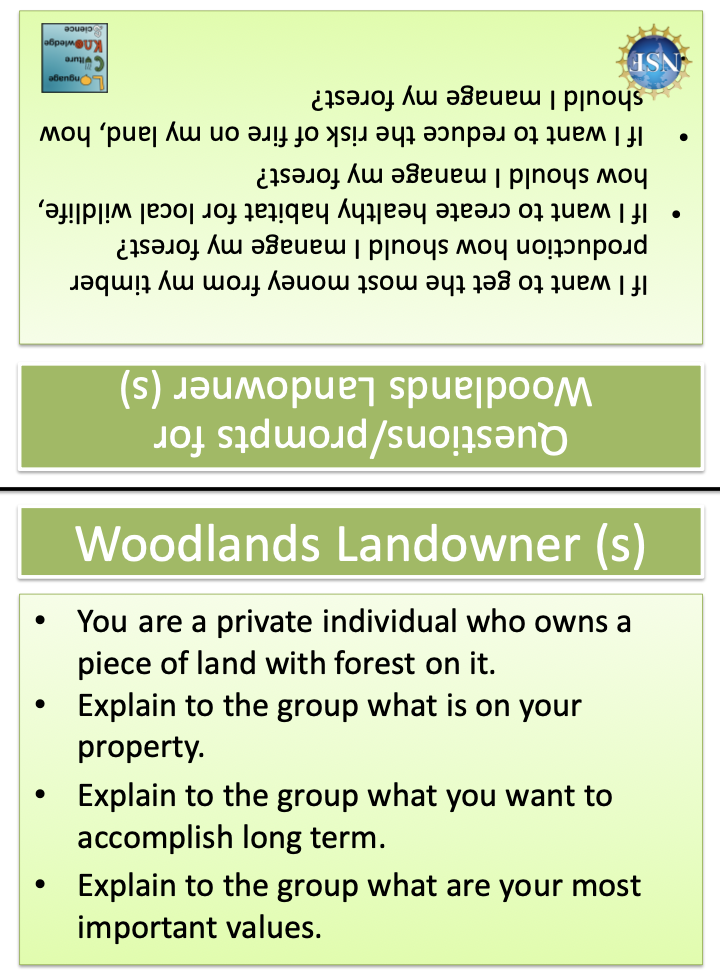
The majority of fires are caused by humans, and with almost 50% of the State covered by forestland, we all have a role to help protect the forest and our communities from catastrophic wildfires. So there are many reasons why all Oregonians, no matter where you live, should care about our forests. Whether you live surrounded by forests or must drive hours to see one, forests have affected the lives of Oregonians throughout history and will continue to do so for the foreseeable future. The good news is that there are things we can do to increase forest resilience and decrease fire risk. We will learn about forest management and how land owners and foresters in Oregon work together to decrease risks while gaining other benefits from our forests.

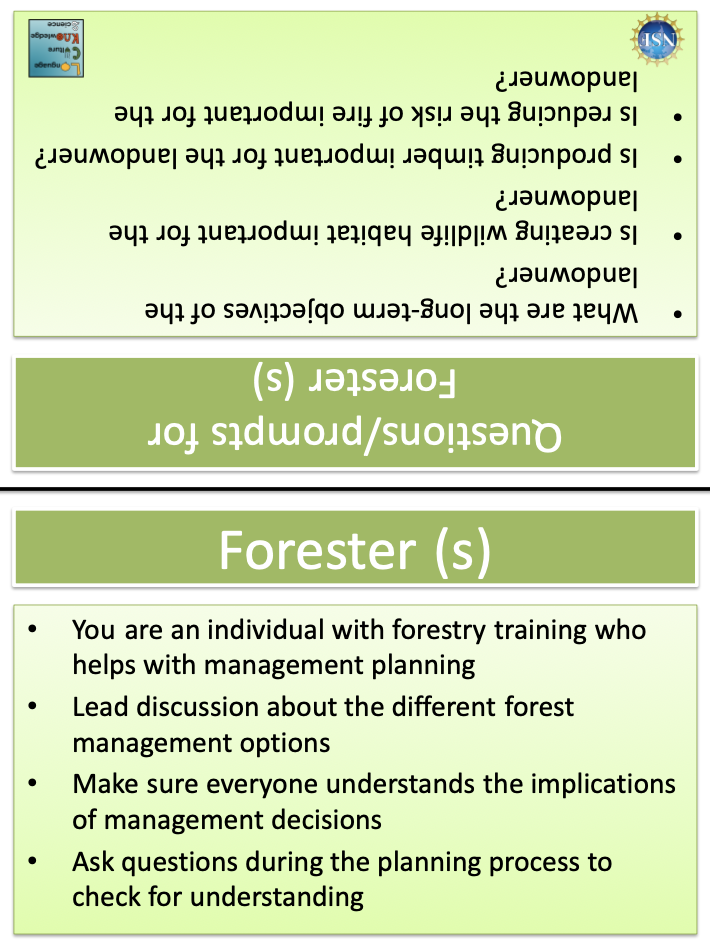
Talk with your partner about the following questions and then write your answers.

1. When you think about Oregon forests and trees, what do you picture? Why?
2. What ideas do you already have about how we can manage Oregon’s forests together?

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**LaCuKnoS Role Cards - Expert Group**





**Managing Oregon’s Forests Together**

**Expert Group Background Information**

**Landowners**

Before settlers arrived in Oregon, the land looked different from today. Vast prairies and savannas with scattered Oaks or ponderosa pines were common in the valleys, and fast growing Douglas-fir was more abundant at higher elevations and steeper terrain. Native Americans used to manage the forest by using fire. These fires allowed them to keep forests from overgrowing on hunting grounds and space for gathering plants for their food supply. The fires would burn away smaller trees and ground cover while leaving harder, more fire resistant trees such as Oaks. After settlers arrived, fire was no longer used and the open grasslands were converted into agricultural lands, urban areas and dense ***conifer*** forests. Without fire, the Oaks and grasses are left with little advantage against fast growing conifers.

Many landowners in the Northwest own woodlands that have a mix of Oak, Douglas-fir, white fir and bigleaf maple. When these species grow together, there is competition between the trees for resources like sunlight and water, impacting the quality of the trees. For Oak trees, it can cause the ***crown*** to grow in a funnel shape, with a long, skinny stem as shown in Figure 1. As time goes by, the Oak loses its ability to produce acorns and re-seed, and their crown gets smaller and smaller, which does not allow them to receive enough sunlight to survive. For Douglas-fir, often used to produce everyday wood products such as paper, the amount and quality of the wood declines. In order to manage these resources, landowners create management plans for their forests including ***silvicultural*** interventions such as ***thinning*** and ***clearcut*** depending on their intended use of the land. Forestry experts advise landowners on management strategies, providing information that is important for landowners to make decisions about what to grow and how to best harvest their forests. Without interventions, the forests will naturally be dominated by fast growing, low-quality Douglas-fir. This mixed growth, providing more fuel, also increases the potential for severe fires.

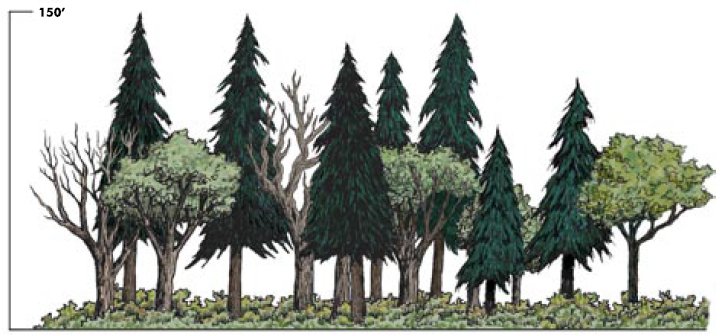


Figure 1. Mixed forest, showing conifers and funnel shaped Oaks.

When considering management strategies, If a landowner wishes to restore Oak savanna habitat from a mixed forest, this can be accomplished through a silvicultural technique such as thinning. The process starts by removing trees that are competing for resources with the Oaks, such as faster growing conifers like Douglas-fir and other more ***shade- tolerant*** trees. This allows the remaining Oaks to utilize water, sunlight and nutrients that were previously unavailable. Thinning can be performed later on, to promote crown growth in the remaining trees (Figure 2). Because most of the remaining Oak savannas are located on private land, landowners play a critical role in restoring these scarce habitats. To assist landowners in these efforts, government incentives may be available to help pay for these interventions.



Figure 2. Oaks with open canopies dominated by trees with full, mushroom-shaped crowns.

For timber harvesting, Douglas-fir is a native conifer tree with excellent wood properties and relatively fast growing. These are two reasons why it is a species preferred by forest landowners to produce timber. Because there is such a need for these products, landowners consider the most efficient way possible while minimizing impacts to the environment. Because of its soil and climate, many areas of Oregon are a great place to grow trees. Conifer forests follow a growth curve that peaks at a certain age, as trees grow close together they compete for resources such as nutrients, water and sunlight. Weaker trees start losing the race and fall behind in growth until they die, this is a natural process that is imitated by humans to concentrate growth in the remaining trees.

Landowners must consider both economic, environmental and sustainability factors to determine a management plan for their forests. This includes deciding which silvicultural interventions (including thinning and clearcut) are best and when they should be implemented. Forestry experts advise landowners on these management strategies and techniques, providing important information that helps landowners make these decisions.

**Foresters**

Before settlers arrived in Oregon, the land looked different from today. Vast prairies and savannas with scattered Oaks or ponderosa pines were common in the valleys, and fast growing Douglas-fir was abundant at higher elevations and steeper terrain. Native Americans used to manage the forest by using fire. These fires allowed them to keep forests from overgrowing on hunting grounds and gathering plants for their food supply. The fires would burn away smaller trees and ground cover while leaving harder, more fire resistant trees such as Oaks. After settlers arrived, fire was no longer used and the open grasslands were converted into agricultural lands, urban areas and dense ***conifer*** forests. Without fire, the Oaks and grasses are left with little advantage against fast growing conifers.

Oak savannas also provide habitats that support an abundance of wildlife species. They provide shade, nesting sites, food source for wildlife as well as microhabitat for mosses, lichens and insects. They help maintain native biodiversity; reduce fire hazard and can be combined with farm use and open grasslands. Unfortunately, less than 1% of these oak-dominated ecosystems remain in state/federal protected areas. The vast majority are owned by private landowners, making them key players in the effort to maintain this important natural resource. Foresters play a key role in providing resources and information to landowners to help them manage and protect these valuable resources.

Many landowners own woodlands that have a mix of Oak and other species such as Douglas-fir, white fir and bigleaf maple. When these species grow together, the Oak’s ***crown*** usually grows in a funnel shape, with a long, skinny stem as shown in Figure 1. As time goes by, the Oak loses its ability to produce acorns and re-seed, and their crown gets smaller preventing the Oaks from obtaining enough sunlight to survive and the fast-growing conifers take over.

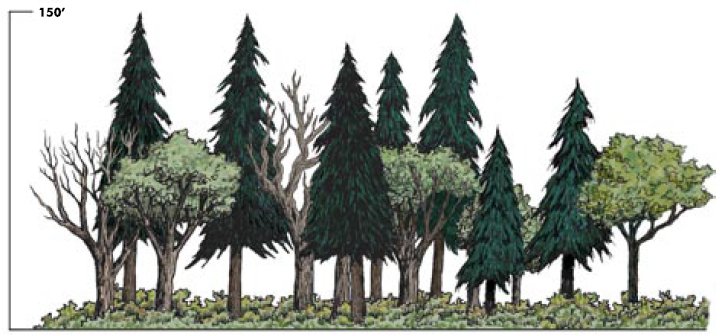


Figure 1. Mixed forest, showing conifers and funnel shaped Oaks.

To restore Oak savanna habitat from a mixed forest, a ***silvicultural*** technique such as ***thinning***  is used. The process starts by removing trees that are competing for resources with the Oaks, such as faster growing conifers and other more ***shade- tolerant*** trees. This allows the remaining trees to utilize water, sunlight and nutrients that were previously unavailable. Additional thinning can be performed later on to promote crown growth in the remaining trees.

As a society, we use wood products every day. Some of these important products include paper, toilet-paper and timber for construction. Douglas-fir is a native conifer tree with excellent wood properties that is fast growing, reasons why it is a species preferred by forest landowners to produce timber. There is a wide variety of ways a forest can be managed for timber purposes. A typical Douglas-fir plantation on a 60 year rotation in Western Oregon could be managed, to maximize timber production, using the following steps:

***Step 1- Pre-commercial thinning***: cutting trees that are dying or that are not growing as fast to free resources for the remaining trees. You must not thin out too many or large gaps will result in the remaining trees having large branches. Large branches reduce the value of the timber that will be harvested in the future. This thinning is usually performed around 12-14 years when trees are not yet large enough to be sold for timber. A young overstocked forest is shown in Figure 2.



Figure 2. Young overstocked Douglas-fir stand. Picture source: Northwest Natural Resource Group <https://www.nnrg.org/the-rhyme-reason-behind-pre-commercial-thinning-aka-pct/>

***Step 2-Commercial thinning***: a second thinning process usually done at 38-40 years removes additional trees to free up resources for the ones left to keep growing. These trees are large enough in size to harvest for some timber products such as paper.

***Step 3- Clearcut***: at the end of the growing cycle comes the final harvest. At this time, the best and largest trees have reached their best timber potential at around 60 years old. These trees are now very valuable and can be sold and used for many different forest product

**Managing Oregon’s Forests Together**

**Supplemental Information for Role Cards**

**Role Card supplement: Forester**

| **Unit prescription** | **Action** | **Pros** | **Cons** |
| --- | --- | --- | --- |
| Oak restoration  (for existing mixed Oak forests) | Douglas-fir, overstocked Oak and other vegetation would be eliminated to release Oak from competition | * Restore habitat that is currently very scarce * Provide food and shelter for animals and insects specifically associated with Oak * Possible government incentive | * Depending on the quality of the removed vegetation, it can cost money to implement * Little potential for future revenue on timber * Needs specialized logger, careful execution. |
| Douglas-fir plantation | Douglas fir plantation, thinning or clearcutting depending on the initial state of the unit | * Potential for high quality timber production * Good potential for future revenue * Any logger with the right equipment can do it | * It does not provide the unique and scarce habitat from pre-settlement time. * The forest has a simple structure, does not provide rich wildlife habitat * May not be aesthetically pleasing |
| Design your own option |  |  |  |

**Role Card supplement: Woodland Landowner**

| **Unit prescription** | **Action** | **Pros** | **Cons** |
| --- | --- | --- | --- |
| Oak restoration (for existing mixed Oak forests) | Douglas-fir, overstocked Oak and other vegetation would be eliminated to release Oak from competition | * Providing habitat that has been mostly lost * Possibility to use Oak wood for own use * Possibility of grazing | * Likely to be an out of pocket cost * It takes yearly maintenance, such as planting grass seeds and herbicide application * Land use restriction if government helps with funds |
| Douglas-fir plantation | Douglas fir plantation, thinning or clearcutting depending on the initial state of the unit | * Good potential for future revenue * Producing timber for selling or own projects * Replanting likely to be covered with revenue from removed trees | * It does not provide the unique and scarce habitat from pre-settlement time. * It requires herbicide application and initial thinning that will cost money in the first few years * Landowner is required by law to replant soon after harvest |
| Design your own option |  |  |  |

**Managing Oregon’s Forests Together**

**Expert Group Exit Ticket**

| What is your role? |
| --- |
| What are your options for managing the woodland property? |
| Do you need any additional information? |

**Developing a Forest Management Plan for a Woodland Property**

**Property Map and Description**

| **Guiding Question:**   1. **What information do you need to make a forest management plan for the woodland property?**   **Directions**:   1. Here are some common goals that woodland landowners have. Use information you get in your expert groups to determine the goal(s) that you prioritize in your forestry management plan.   a. Improve forest health  b. Protect against wildfires  c. Provide and improve wildlife habitat  d. Generate income from harvesting timber  e. Restore native habitats |
| --- |
| H:\Fran's backup\Work\Grants\LaCuKnoS\Lesson 1\Lacuknos map_V5.tif |

**Description of Shady Oak Unit (Unit 1)**

Mixed Oak stand

This stand has a mix of heavily stocked Douglas-fir, big leaf maple and Oregon white oak. The topography includes flat areas and gentle hills with well-drained clay soils. Three non-fish bearing streams run across the unit, and there is access around the entire unit with durable surface roads that have been well maintained for year-round truck traffic. The stand presents a wildfire hazard as it is, and the oak is presenting signs of crown loss.



Photo: Legacy Oaks Task Force and Prairie Task Force Photo: Connie Harrington

**Description of Windy Ridge Unit (Unit 2)**

Young Douglas-fir stand

This stand has a 13 year old Douglas-fir plantation. The ground is steep with some flatter portions and features clay soils. No streams run across the unit, and there is access at the top and bottom of the unit with durable surface roads that have been well maintained for year-round truck traffic. The stand has not been thinned since it was planted.



Young overstocked Douglas-fir stand. Picture source: Northwest Natural Resource Group https://www.nnrg.org/the-rhyme-reason-behind-pre-commercial-thinning-aka-pct/

**Description of Broken Top Unit (Unit 3)**

Douglas-fir stand

This stand has a 40 year old Douglas-fir plantation. The ground is steep with some flat portions and features clay soils. Small non-fish bearing streams stem from the bottom of the unit, and there is access at the top and bottom of the unit with durable surface roads that have been well maintained for year-round truck traffic. The stand was pre-commercially thinned at 12 years old.



A forest being considered for precommercial thinning. Picture source: Northwest Natural Resource Group https://www.nnrg.org/the-rhyme-reason-behind-pre-commercial-thinning-aka-pct/

**Description of Mighty firs Unit (Unit 4)**

Mature Douglas-fir stand

This stand has a 60 year old Douglas-fir plantation. The ground is steep and features clay soils. A non-fish bearing stream crosses the unit and drains into Unit 1, and there is access all around the unit with durable surface roads that have been well maintained for year-round truck traffic. The stand was pre-commercially thinned at 12 years old and commercially thinned at 40 years old.



Mature Douglas-fir stand. Picture source: https://www.nps.gov/pore/learn/management/firemanagement\_fireecology\_vegtypes\_douglasfir.htm**Managing Oregon’s Forests Together**

**Forestry Management Plan Graphic Organizer**

| **What is your management plan?**  (Look at the language and information from your expert groups to make your claim stronger and more meaningful) | **What evidence did you use to support your management plan?**  (Think about the strongest evidence you have that supports your plan. Try to give 3 different examples of evidence) | **How does your evidence support your management plan?**  (Does your evidence relate specifically to your claim? Providing clear connections will help to convince your audience) |
| --- | --- | --- |

| **In one sentence describe your forestry management plan. (It is ok to still have lingering questions)**  **Forestry Management Plan:** | 1. Evidence:        2. Evidence:      3. Evidence: | 1. Evidence 1 supports my forestry management plan because….        2. Evidence 2 supports my forestry management plan because….      3. Evidence 3 supports my forestry management plan because…. |
| --- | --- | --- |

**Managing Oregon’s Forests Together**

**LaCuKnoS Investigation Summary**

**With a partner, look at your Forest Management Plan. Then talk about and write your answers to the following questions.**

| If you want to convince your friends that your forestry management plan is the best option, what language would you use to convince them?  If you want to convince an Oregon woodland landowner that your forestry management plan is the best option, what language would you use to convince them? |
| --- |