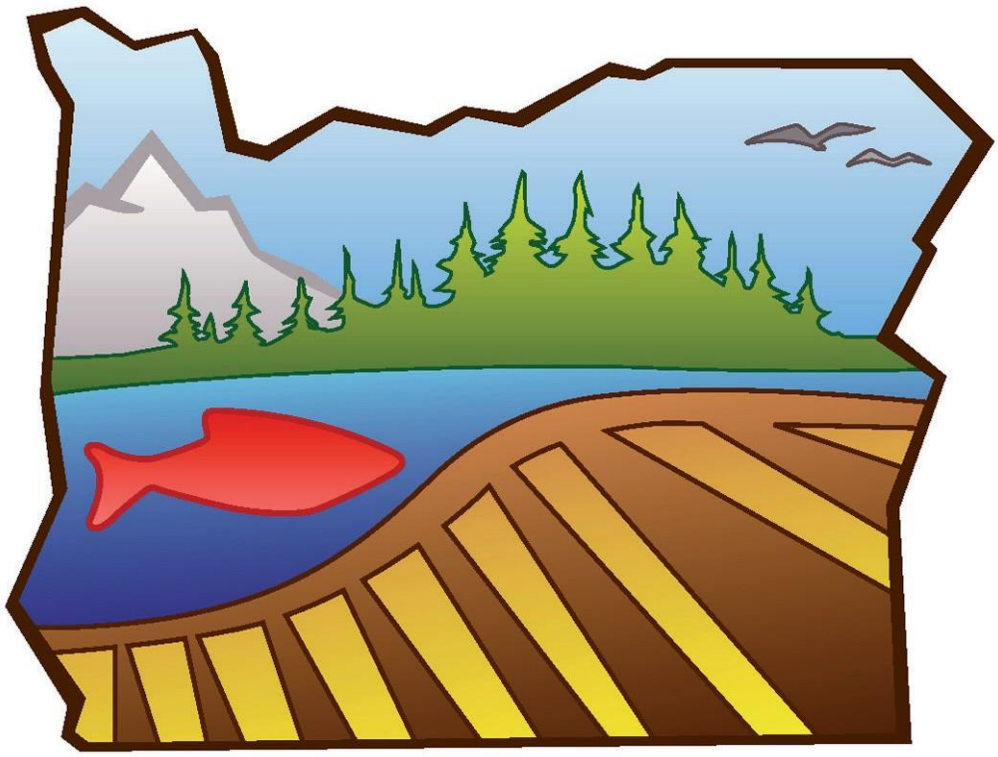

OREGON
ENVIROTHON

2025

Advisor Manual

Oregon Envirothon Environmental Education Competition May 2, 2025

Envirothon Training Agenda

December 11, 2024, 9 am – 3:30 pm
Oregon Garden, Silverton

9:00	Welcome & Introduction to Envirothon 2025 *Rikki Heath, Director of K-12 Education Programs, Oregon Forest Resources Institute*
9:30	How Do We Sustain Oregon's Forests? *Julie Woodward, Deputy Director, Director of Forestry, Oregon Forest Resources Institute*
10:30	Break
10:45	Introducing Meadow Creek: Oral Presentation Scenario *Lucas Glick, District Silviculturist, U.S. Forest Service, Wallowa/Whitman National Forest, La Grande Ranger District*
11:45	Lunch
12:15	Envirothon 101: Peer Teacher Panel *Chris VanNess, Logos Charter School; Helen Haberman, Rachel Carson Environmental Science Academy, Churchill HS; Lori Loeffler, Tillamook HS;* and *Amanda Elliott, Eagle Point HS*
1:00	Break
1:15	Core Four Stations Rotation 1—1:15; Rotation 2—1:45; Rotation 3—2:15; Rotation 4—2:45 (30 minutes each) Forestry – *Julie Woodward, Deputy Director, Oregon Forest Resources Institute* Wildlife – *Kayla Brown* and *Corbin Murphy, Wildlife Biologists, Bureau of Land Management* Soils – *Marissa Theve, Resource Soil Scientist, Natural Resource Conservation Service* Aquatics – *Kassi Roosth, Urban Conservation Planner for Marion Soil and Water Conservation District;* and *Nenette Sequeria, Water Educator,* and *Deborah Topp, Environmental Outreach Supervisor, City of Salem*
3:15	Wrap-up *Rikki Heath*
3:30	Adjourn

Introduction

What is Envirothon?

Envirothon is a hands-on environmental problem-solving competition for high school-age students in the United States and Canada. Participating teams of five students compete in these natural resource categories:

- Aquatic ecology
- Soils and land use
- Forestry
- Wildlife
- A current environmental issue (a different one each year)

Led by a volunteer advisor, teams usually meet from late autumn until spring, and work cooperatively to develop their knowledge of ecology and natural resource management and to practice their environmental problem-solving skills in preparation for the competition.

Envirothon partners with local conservation districts, forestry associations, educators and cooperating natural resource agencies to organize and conduct competitions on the local, regional, state and/or provincial level. Winning teams from each state and province advance to the **North American Envirothon** for the opportunity to compete for scholarships and prizes.

Benefits

Combining in-class curriculum and hands-on field experiences, the **Envirothon** program is an excellent way to supplement environmental education inside and outside the traditional classroom. Many students step away from the **Envirothon** experience excited about learning and motivated to pursue careers in environmental studies, environmental law, natural sciences and natural resource management.

Envirothon stimulates, reinforces and enhances students' interest in the environment. It allows them the opportunity to get "up-close and personal" with their state's natural resources and to gain valuable knowledge in ecology and natural resource management principles and practices. Team trainings may include field trips to natural resource sites, museums or other areas of interest; listening to presentations given by natural resource professionals; and careful study of natural resource materials.

Mission and Goals

The mission of Oregon Envirothon is to develop knowledgeable, skilled and dedicated citizens who are willing and prepared to work towards achieving and maintaining a natural balance between the quality of human life and the quality of the environment.

This mission is accomplished by developing in young people an understanding of the principles and practices of natural resource management and ecology through dealing with complex resource management decisions.

The following goals guide the program.

Goal 1

To promote a desire to learn more about the natural environment and equip students with the knowledge and skills needed to apply the basic principles and practices of resource management and ecology to complex environmental issues.

Goal 2

To promote stewardship of natural resources and to encourage the development of critical thinking, cooperative problem-solving and decision-making skills required to achieve and maintain a natural balance between the quality of life and the quality of the environment.

Goal 3

To provide students with experience in environmentally oriented activities, enabling them to become environmentally-aware, action-oriented citizens.

Structure of the Oregon Competition

Important Dates to Remember

Team Registration Deadline: April 11, 2025

Oral Presentation Video Deadline: April 18, 2025

Competition Date: May 2, 2025

Teachers and students may prepare for the competition by using Oregon Envirothon's training tools, including study topics and suggested activities, available at www.oregonenvirothon.org. Each year's current environmental issue drives the educational focus of the competition. Oregon Envirothon uses the current environmental issue selected by National Conservation Foundation Envirothon (NCF-Envirothon) for the year.

Testing Stations

The one-day **Oregon Envirothon Competition** will test each team's knowledge and problem-solving skills at five testing stations:

- Aquatic Ecology
- Forestry
- Soils/Land Use
- Wildlife
- 2024 Current Environmental Issue

The tests contain multiple choice, fill-in-the-blank, diagrams and short answer questions. Each test consists of approximately 25 questions, which are written and designed each year by conservation district and other natural resource professionals.

Teams will answer the test questions in the 25-minute time allotted for each station, completing one collective answer sheet for their team for the station. **Collaboration, cooperative decision-making, free exchange of ideas and information pooling within teams are desirable.**

All necessary testing equipment and supplies will be provided. ***Students are not allowed to bring notebooks, backpacks, electronic equipment of any kind or personal water bottles to the test sites.*** Each team's tests from the five testing stations will be graded, scored and totaled together.

Note that testing will take place at outdoor testing stations. Students need to dress appropriately for a range of weather conditions by dressing in layers, bringing jackets, and wearing footwear suitable for wet, muddy terrain.

Oral Presentations

Teams prepare an oral presentation on the year's Current Environmental Issue topic. Each team submits a video of their 10-minute oral presentation by **April 18th** to Oregon Envirothon's coordinator Rikki Heath at heath@ofri.org. The videos will be judged and scored prior to the competition. The oral presentations may include PowerPoint slides, flip charts or other necessary props or visual aids.

The two teams with the highest video scores will make live presentations in front of the judges and the student audience. They should be prepared for a five-minute question-and answer-time with the judges.

All team members must participate in the team's presentation. Visual aids are welcome and must be prepared in advance. A laptop computer and projector will be available for each team to use during their presentation, if needed. During the top team presentations, all team members must wear an Oregon Envirothon t-shirt. No school or team identification, either written or stated, is permitted.

Awards and Results

At the end of the testing periods, the video scores will be combined with the test scores to determine the top five teams. Awards will be given to teams who place first through fifth, to the winners of the oral presentation category, and to the teams who have the highest test scores for each of the five testing stations. Awards are also given for FFA and Future Natural Resource Leaders (FNRL). The overall champion of the Oregon Envirothon will have the option of representing Oregon at the **NCF- Envirothon in Calgary, Alberta, Canada,** July 20 - 26, 2025. All results will be available that day.

Day of the Event

On arrival at the competition, each team is assigned a **number** and a **test station rotation**. After the welcome and introductions, the Oregon Envirothon coordinator reviews with students the contest format, rules and scoring.

Testing Station Rotations

Once the competition begins, teams will have exactly 25 minutes to complete their tests and 10 minutes to move to the next station and get ready for the next test, for a total of 35 minutes for each rotation. They will answer the 20+ test questions in the time allotted, completing one collective answer sheet for their team.

Each test station rotation includes:

10-minute transition:

- Students are guided to the test site.
- Volunteers hand out the tests and pencils.
- Volunteers provide any necessary orientation information about the test (2-4 minutes).

25-minute testing period:

- Students work to answer the 20+ test questions.
- Volunteers notify the teams at the 20-minute mark that 5 minutes are remaining.
- Volunteers collect the tests at the 25-minute mark.

After each rotation, students are guided to the next test site and volunteers begin the next round of testing. Completed test sheets remain at the stations to be scored by volunteers. Runners will take the tests to the main scorer, who will calculate the scores.

Top Team Oral Presentations

The two teams with the highest video oral presentation scores will make live presentations in front of the judges and the student audience. There will be five minutes between presentations for scoring, set-up and preparation for the next team.

Presentation of Awards

After the competition and scoring is completed, teams will reassemble for overall results and presentation of awards.

Oregon Envirothon 2024
Rules & Regulations

1. Team members must be enrolled in grades 9-12 (home school, private school or public school).

2. Each team must have a maximum of five members and a minimum of three. Team members may not be drawn from different schools. One alternate is permitted for each team. **Teams with fewer than five members will not be allowed to advance to the National Conservation Foundation Envirothon (NCF-Envirothon).**

3. Alternate team members may substitute for regular team members if properly registered.

4. Teams will be issued a number that must be used during the competition. Switching team members will not be allowed after the registration of the team.

5. Teachers, team advisors or chaperones must accompany their teams to the competition but may not assist their teams in any way once the competition is under way. Team advisors must stay on site during the event.

6. The Oregon Envirothon shall consist of five competitive sites based on soils/land use, aquatic ecology, forestry, wildlife and the current environmental issue, and one video Oral Presentation on the current environmental problem. Judges' and scorers' decisions are final in all events.

7. Scoring for the Oregon Envirothon will be as follows:
   a. Each of the five outside testing sites will be worth 50 points for a total of 250 points.
   b. The video presentation will be worth 100 points.
   c. Teams earning the **top 2** video presentation scores will present LIVE at the Oregon Envirothon, and the LIVE scores will determine the winner of the Oral Presentation Category.
   d. The **top 5** teams for Oregon Envirothon will be determined using the scores from the five testing stations and the VIDEO presentation score.
   e. The total competition will be worth 350 points.

8. Teams will not be allowed to bring notes, field guides or other resource materials to the stations. Any necessary materials will be provided by Oregon Envirothon, including bottled water. **No backpacks or electronic devices of any kind or personal water bottles are allowed at the testing sites.**

9. Team members will work together to complete their field experiences and questions and submit one answer sheet before moving on to the next site. Twenty-five minutes will be allowed for the test at each field site and ten minutes will be given to rotate to the next site.

10. The winning team will be the team with the highest cumulative score from the six events (the five testing stations and the video presentation). The tie breaker will be the highest score from the oral presentation.

11. **Registration must be received by April 11, 2025.** All illegible registration forms will be rejected. Advisors must submit the Parental Consent Form and Medical Release Form for each team member to the Oregon Envirothon competition.

12. If the winning team cannot represent Oregon at the NCF-Envirothon, the team with the next highest score will be eligible to compete.

13. No tobacco, intoxicants or drugs will be allowed on site.

14. Rules and regulations of the Oregon Envirothon are subject to change. Any and all relevant changes will be explained to all teams and advisors.

Oregon Envirothon

Example Schedule - Day of Event

Student Activity Schedule

8:30 am	-	9:00am	Registration and breakfast at The Oregon Garden
9:00 am	-	9:15am	Welcome/Event Orientation
9:30 am	-	9:55am	Rotation #1
10:05 am	-	10:30am	Rotation #2
10:40 am	-	11:05am	Rotation #3
11:15 am	-	11:40am	Rotation #4
11:50 am	-	12:15pm	Rotation #5
12:15 pm	-	1:15pm	Lunch/Tabulations
			Announcement of Top 2 Oral Presentation Teams
			Oral Presentation preparation for Top 2 Teams
1:15 pm	-	1:35pm	Presentation from climate professionals
1:35 pm	-	1:55pm	1st Oral Presentation
1:55 pm	-	2:15pm	2nd Oral Presentation
2:15 pm	-	2:35pm	Tabulations
2:35 pm	-	3:00pm	Award Ceremony and Photo Session

Oregon Envirothon
Example Score Totals

Team Number_____

(Test Score/Possible Points)

Soils/Land Use Site	_____/50
Forestry Site	_____/50
Aquatic Ecology Site	_____/50
Wildlife Site	_____/50
Current Environmental Issue Site	_____/50
TEST TOTALS	_____/250
Video Oral Presentation	_____/50
FINAL SCORE	_____/350

Oregon Envirothon
Team Registration

To register your team, complete the registration form at www.oregonenvirothon.org/registration Registration will open on January 1, 2025, and close on April 18, 2025.

The registration fee of $100.00 per team (payable to **Oregon Envirothon**) must be received by **May 2, 2025** to secure your attendance. Either a check or school PO # is an acceptable form of payment. The $50.00 is nonrefundable and goes toward the cost of administering the program and competition.

Each team member must have a signed and completed parental consent form, submitted at registration at the Oregon Envirothon competition on May 3, 2025.

For more information, please contact:
Rikki Heath, Oregon Envirothon Coordinator
P.O. Box 463
Silverton, OR 97381
E-mail: heath@ofri.org
Phone: (503) 799-4792

Oregon Envirothon
Parental Consent Form

Dear Parent/Guardian:

We are excited for your student to participate in Oregon Envirothon at the Oregon Garden, hosted by the Oregon Forest Resources Institute (OFRI). It is of the utmost importance to the Oregon Envirothon committee and to OFRI that we provide a safe and fair event for all participants. In case of an emergency, the law requires that parental permission be obtained for medical care of minors (under age 18). The law also requires parental permission for the taking of pictures of minors. Please sign the following consent form. Thank you.

School/Group name: _____

Student name: _____

Mailing address:

_____

_____

Parent/guardian name: _____

In case of emergency, please list any numbers where parent/guardian can be reached:

_____ _____

_____ _____

Please provide any important medical information.

Allergies (food, drugs, insect, etc.)

_____

Special medical concerns or conditions

Page two for signature…

AUTHORIZATION FOR EMERGENCY MEDICAL CARE

In the event of an emergency, accident or illness, I the undersigned parent/guardian give permission to the Oregon Envirothon/Oregon Forest Resources Institute to administer emergency medical care to my child and/or, if deemed necessary, to secure emergency medical services and incur expenses, for which I will be responsible for payment.
I further give permission to have my child treated by a physician who will perform any diagnostic, therapeutic and/or operative procedures as deemed necessary.

PHOTOGRAPHY AUTHORIZATION AND RELEASE

I hereby grant the Oregon Envirothon and Oregon Forest Resources Institute ("OFRI") permission to use, publish or display my minor child's likeness in any photographs and any reproduction thereof or any video or voice recordings in any of their publications, without payment or any other consideration. I understand and agree that such materials will become the property of Oregon Envirothon and OFRI and will not be returned. I hereby irrevocably authorize Oregon Envirothon and OFRI to prepare, edit, alter, copy, exhibit, publish or distribute the photographs or video or voice recordings for purposes of publicizing programs of Oregon Envirothon and OFRI, or for any other lawful purpose. In addition, I waive the right to inspect or approve the finished product, including written, audio or electronic copy, wherein my minor child's likeness or voice appears. I also give permission to Oregon Envirothon and OFRI to use my minor child's grade level in school, school name and school location as an accompaniment to the photo, video or voice recording. I hereby hold harmless, release and forever discharge Oregon Envirothon and OFRI from all claims, demands and causes of action which I, my heirs, representatives, executors, administrators, or any other persons acting on my behalf or on behalf of my estate may have by reason of this authorization.

I have read this authorization and release before signing below and I fully understand its contents, meaning and impact.

Signature of parent/guardian of minor:

_____

Date of signature: _____

Forest Ecology Study Guide

The following key points, learning objectives, and suggested activities will help you and your students prepare for the Forest Ecology component of the Oregon Envirothon competition. For study information specific to the North American competition, please see the Resources section on the NCF-Envirothon website at envirothon.org.

Key Point 1—Tree Physiology and Tree and Shrub Identification

Learning Objectives:

1. Know the parts and tissues of a tree and be able to explain the growth cycle and life cycle of a tree.
2. Understand the processes of photosynthesis and respiration and how they are important to the growth and reproduction of trees.
3. Identify tree and shrub species using a dichotomous key or field guide.

Suggested Activities:

1. Identify trees and shrubs from leaf and seed samples using a dichotomous key and a tree guide. Identify the common name and scientific (Latin) name for the following common trees and know their approximate ranges in Oregon:
   - Douglas-fir
   - Sitka Spruce
   - Western hemlock
   - Port-Orford-cedar
   - Junipers
   - Western larch
   - Western white pine
   - Oregon ash
   - Redwood
   - Englemann spruce
   - Western Redcedar
   - Incense cedar
   - Pacific yew
   - Red alder
   - Birches
   - Poplars
   - Lodgepole pine
   - Sugar pine
   - Bigleaf maple
   - Oregon white oak
   - Ponderosa pine
   - Cottonwoods
   - Vine maple
   - True firs (6)

Key Point 2—Forest Ecology

Learning Objectives:

1. Know the typical forest structure: canopy, understory and ground layers and crown classes.
2. Understand forest ecology concepts and factors affecting them, including the relationship between soil and forest types, tree communities, regeneration, competition, and primary and secondary succession.
3. Identify the abiotic and biotic factors in a forest ecosystem and understand how these factors affect tree growth and forest development. Consider factors such as climate, weather, fire, insect outbreaks, microorganisms, and wildlife.
4. Understand that Oregon is home to a variety of forest types, primarily dominated by coniferous trees like Douglas-fir, Western hemlock, Sitka spruce, and Ponderosa pine, with each type adapted to its specific climate and geography.

Suggested Activities:

1. Draw and compare food webs of a mature deciduous forest and a mature coniferous forest. Explain how wildlife habitat relates to the forest community and describe the niches of various organisms that live in both forest ecosystems.
2. Examine a "tree cookie" or core sample taken with an increment borer to determine the age, growing conditions, insect and disease damage, and past weather conditions.
3. Understand the ecology of fire: Explore patterns of change brought about by fires in a forest ecosystem.
4. Identify, understand the life cycles of, and know common control techniques for the following insect pests and diseases of trees in Oregon, including integrated pest management:
   - Armillaria
   - Dwarf Mistletoe
   - Emerald Ash Borer
   - Flat Headed Borers
   - Heartrot
   - Spruce Budworm
   - Swiss needle cast
   - Western Pine Beetle
   - White Pine Blister Rust

Key Point 3—Sustainable Forest Management

Learning Objectives:

1. Understand the term silviculture and be able to explain the uses of the following silviculture techniques: forest health thinning , prescribed burning, planting, harvesting (including single tree and group tree selection), shelterwood method, and clear-cutting with and without seed trees.
2. Know how to use forestry tools and equipment in order to measure tree diameter, height, volume and basal area.

3. Understand how the following issues are affected by forest health and management: biodiversity, forest fragmentation, forest health, air quality, aesthetics, fire, global climate change and recreation.
4. Describe sustainability and understand how sustainable forestry management practices and the Oregon forest protection laws and policies protect forests for future generations.
5. Understand that forests are managed to reflect the interests and practices of different landowners, which in Oregon include the state and federal governments, private timber companies, tribes and small woodland owners.
6. Understand how economic, social and ecological factors influence forest management decisions.
7. Understand that science and technology are used in all aspects of forest management.

Suggested Activities:

1. Use the following forestry tools and know how they are used in forest management: clinometer, increment borer, diameter tape, Biltmore stick, abney level, compass, prism and relescope.
2. Use a variety of volume tables to calculate the volume of lumber for several different tree species.
3. Compare two different forest types of Oregon (for example, a juniper woodland in eastern Oregon and a conifer forest in western Oregon). Identify economic, social and ecological factors that affect how both of these forests are managed.
4. Explain the information technology used to monitor and effectively manage forests, and give specific examples of how this technology is being used in various aspects of forest management.

Key Point 4—Trees as an Important Renewable Resource

Learning Objectives:

1. Understand the importance and value of trees in urban and community settings and know the factors affecting their health and survival.
2. Understand the economic value of forests and know many of the products they provide to people and society.
3. Explain the "ecosystem services" provided by trees and understand why trees and forests are important to human health, recreation, wildlife and watershed quality.

Suggested Activities:

1. Use the online tool *i-Tree* to calculate the tree benefits and ecosystem services provided by individual trees.

2. Create a display showing the value of trees in both urban and suburban settings. Identify the factors that affect their health and survival and explain how to properly care for trees in an urban environment.
3. Make a list of products and by-products that come from your home and are made from trees. Describe the chemical and physical properties of trees used in making these products.

Aquatic Ecology Study Guide

The following key points, learning objectives, and suggested activities will help you and your students prepare for the Aquatic Ecology component of the Oregon Envirothon competition. For study information specific to the North American competition, please see the Resources section on the NCF-Envirothon website at envirothon.org.

Key Point 1—Abiotic factors

Learning Objectives:

1. Know the processes and phases for each part of the water cycle and understand the water cycle's role in soil nutrient erosion, salinization of agricultural lands, and climatic influences.
2. Understand the concept and components of a watershed and be able to identify stream orders and watershed boundaries. Know the features of a healthy watershed and an unhealthy watershed.
3. Know how to perform and interpret chemical water quality tests and understand why aquatic organisms and water quality are affected by the physical, chemical and biological conditions of the water.

Suggested Activities:

1. Use topographic maps to investigate the concept of a watershed, identify a river's watershed system, and delineate the watershed of a given area. Be able to describe how different land uses and watershed characteristics can affect water runoff, water flow, types of stream habitats and management approaches.
2. Investigate and find out who is using the water in your watershed and become familiar with historic stream and river levels to learn if levels are increasing or decreasing. Use stream assessment data to determine the health of your watershed.

3. Conduct chemical water quality tests to determine the temperature, dissolved oxygen, pH, phosphorus, alkalinity, nitrogen, and dissolved oxygen percent saturation of a water sample and explain why these test results are indicators of water quality and can be used to assess and manage aquatic environments.

Key Point 2—Biotic factors

Learning Objectives:

1. Understand the dependence of all organisms on one another and how energy and matter flow within an aquatic ecosystem.
2. Understand the concept of carrying capacity for a given aquatic ecosystem and be able to discuss how competing water usage may affect the ability of the system to sustain wildlife, forestry, and anthropogenic needs.
3. Identify common, rare, threatened and endangered aquatic species as well as Aquatic Nuisance Species (ANS) through the use of a key.
4. Know how to perform biological water quality monitoring tests and understand why these tests are used to assess and manage aquatic environments.

Suggested Activities:

1. Describe the habitat needs of three specific aquatic animals, and compare and contrast the flow of energy in three different aquatic food chains.
2. Create a visual display of rare and endangered aquatic species. Explain how human activities are causing species imperilment and specify actions being taken to protect these species.
3. Conduct a biological stream assessment by collecting macro-invertebrates. Stream Data sheets should be used to record and analyze information. Explain why these organisms are biological indicators that help us determine the health of a stream or waterway.

Key Point 3—Aquatic Environments

Learning Objectives:

1. Identify aquatic and wetland environments based on their physical, chemical and biological characteristics.
2. Know characteristics of different types of aquifers, and understand historical trends and threats to groundwater quantity and quality.
3. Understand societal benefits and ecological functions of wetlands.
4. Understand the functions and values of riparian zones and be able to identify riparian zone areas.

Suggested Activities:

1. Describe the physical, chemical and biological characteristics of a stream, river, pond, lake and wetland.
2. Explain how different types of aquifers are indicators of water quantity and water quality. Describe how subsidence and salt water intrusion are related to the falling water table in many aquifers.
3. Describe three functions of wetlands and explain how these functions are met in the absence of wetlands.
4. Describe three functions of riparian zones and explain how the removal of or damage to the riparian zone would affect water quality and specific aquatic food chains.

Key Point 4—Water Protection and Conservation

Learning Objectives:

1. Understand how education programs and enforcement agencies are working together to protect aquatic habitats and prevent those who use our waterways from inadvertently transporting Aquatic Nuisance Species (ANS) from one river to another.
2. Interpret major provincial and /or federal laws and methods used to protect water quality (i.e., surface and groundwater). Utilize this information to propose management decisions that would improve the quality of water in a given situation.
3. Be familiar with the Federal and state agencies that provide oversight of water resources, and understand that Geographic Information Systems (GIS) is a useful and important tool in the management of water resources.
4. Identify global and local sources of point and non-point source pollution and be able to discuss methods to reduce point and non-point source pollution.
5. Understand the interaction of competing uses of water for water supply, hydropower, navigation, wildlife, recreation, waste assimilation, irrigation, and industry.
6. Know the meaning of water conservation and understand why it is important every time you turn on a faucet.

Suggested Activities:

1. List at least 3 Aquatic Nuisance Species (ANS) and describe their effects on an aquatic ecosystem. Consider what can happen when predator ANS are imported, and develop a plan for the eradication of a target ANS.
2. Cite water protection laws at a mock hearing to decide whether a permit should be given to build a new shopping mall along a river.

3. Explain how Geographic Information Systems (GIS) are being used to help communities assess water quality and watershed health information.
4. Compare water usage in different regions of Oregon and propose actions to help counties strike a balance between supply and demand in order to realize maximum benefit from our water resources.
5. Design a comprehensive water conservation plan for your home and the watershed below your home. This should include groundwater replenishment, securing sediment on your property, managing non-point source pollution and following the path of good quality water as it leaves your property on its way to the sea.
6. Many dams are used to provide low-cost electricity at the critical time of day when there is peak demand for electricity. Today, a major issue is deciding which is more important to the economy, low-cost energy or improving/restoring the ecology of a river. Evaluate the issue and develop recommendations for conservation groups and utility executives.

Soils and Land Use Study Guide

The following key points, learning objectives, and suggested activities will help you and your students prepare for the Soils and Land Use component of the Oregon Envirothon competition. See also the *Oregon Envirothon Soils and Land Use Manual*, available at oregonenvirothon.org for additional resources. For study information specific to the North American competition, please see the Resources section on the NCF-Envirothon website at envirothon.org.

Key Point 1—Physical Properties of Soil and Soil Formation

Learning Objectives:

1. Understand the importance of soils and appreciate the relatively small amount of usable soil that exists on Earth.
2. Know the five soil forming factors and understand how they influence soil properties.
3. Identify soil parent materials.
4. Understand the soil forming processes: additions, losses, translocations, and transformations.
5. Identify and describe soil horizon characteristics:
    a. texture
    b. structure
    c. color (using Munsell color charts)
6. Understand how soil profile characteristics can determine basic soil properties and limitations and be used to classify soils.

Suggested Activities:

1. Generate a list of reasons why soils and the study of soil science are important to sustaining life on Earth. Explore how much soil on Earth is available for human use with a cut up apple as a model (see "Apple as the Earth's Soil" for an example.)

2. Describe the five factors of soil formation and be able to explain how each factor affects the soil profile.
3. Examine a soil pit. Describe soil characteristics for each horizon and record your data on the "NRCS Soil Description form, SOI-232" provided in the Oregon Envirothon Soils and Land Use Manual.
4. Use Web Soil Survey or SoilWeb to look at different soil profiles and Official Series Descriptions in your area. Describe differences between the soil types such as texture, drainage and permeability (or saturated hydraulic conductivity), use and vegetation, and geographic setting.
5. Estimate percent sand, silt, and clay for soil samples and determine texture class using the texture triangle. Explain how texture is important and what other soil characteristics it can affect.

Key Point 2—Soil Ecosystems

Learning Objectives:

1. Recognize that biological diversity is crucial to soil health and hence plant, human, and environmental health.
2. Understand how the hydrologic, carbon, and nutrient cycles relate to soil management.
3. Recognize that ecosystem biodiversity is often a reflection of soil biodiversity.

Suggested Activities:

1. Draw a soil food web and discuss why biodiversity is important to healthy soil. For inspiration, see the "Organisms" section of the *Oregon Envirothon Soils and Land Use Manual*.
2. Diagram the nitrogen, carbon, and phosphorus cycles and identify the types of organisms involved. Identify their roles in organic matter decomposition and nutrient cycling.
3. Discuss how the different soil types described in the Soil Classification and Land Use section of the *Oregon Envirothon Soils and Land Use Manual* support different types of ecosystems. Imagine which kinds of plants can grow in each system and how they affect soil.

Key Point 3—Chemical Properties of Soil and Soil Fertility

Learning Objectives:

1. Understand how to sample a soil for lab analysis.
2. Know that plants receive nutrients from the soil and return organic matter to the soil as they break down.
3. Understand how soil fertility relates to the physical and chemical properties of the soil.

Suggested Activities:

1. Collect a soil sample and measure pH, nitrogen (N), Phosphorus (P), and Potassium (K). Record your data and discuss the results. Refer to the Soil Investigations section of the *Oregon Envirothon Soils and Land Use Manual* to learn about soil sampling tools and to Oregon State University's *A Guide to Collecting Soil Samples for Farms and Gardens* (available online).
2. Explain how soil characteristics like texture and organic matter content may affect nutrient management. Hint: think about leaching and how water and nutrients move in the soil profile.
3. Discuss the risks and benefits of using synthetic fertilizer compared to compost. How might this change for a bare area versus one covered in vegetation?

Key Point 4—Soil Conservation and Land Use Management

Learning Objectives:

1. Name common land uses in Oregon and explain how they affect the soil.
2. Discuss how soils filter water and how slope plays a role. See the Soil Permeability/K_{sat}, Slope, and Soil Drainage Classes sections of the *Oregon Envirothon Soils and Land Use Manual*.
3. Describe natural resource career opportunities and the role of government in managing land.

Suggested Activities:

1. Identify different land uses on a map of Oregon and discuss what kinds of soils support them. Use Web Soil Survey or SoilWeb to look at soil profile descriptions in these areas. Discuss how different management might affect the soil and how the soil characteristics might limit land use.
2. Practice using topographic maps to measure slope and compare this to an elevation map made from LiDAR data. Discuss different areas on your map and where you might expect more or less soil erosion and why.
3. Measure slope outside using a clinometer or slope finder and discuss what might happen during a heavy rain event. Notice the ground cover or lack thereof. If possible, dig a small soil pit or push a piece of wire into the topsoil and determine if compaction is present. Classify the soil's permeability/ K_{sat}, drainage class, and slope class. Discuss whether this area would filter water and why or why not.
4. Browse the Natural Resources Conservation Service's careers website. Identify your local Soil and Water Conservation District and look at the staff page. If possible, invite staff to talk to your class about what they do.

Wildlife Ecology Study Guide

The following key points, learning objectives, and suggested activities will help you and your students prepare for the Wildlife Ecology component of the Oregon Envirothon competition. For study information specific to the North American competition, please see the Resources section on the NCF-Envirothon website at envirothon.org.

Key Point 1—Knowledge of Wild Birds, Mammals and Herps

Learning Objectives:

1. Identify wildlife species using mounted specimens, skins/pelts, pictures, skulls, silhouettes, decoys, wings (waterfowl), scats, tracks, animal sounds, or other common signs. Animal tracks may be original or molds made of the prints. Wildlife signs may be real or reproduced.
2. Use a key or field guide to identify wildlife species or signs. Wildlife species or signs may be presented in any form as described above.
3. Identify general food habits (herbivore, omnivore, carnivore), habitats (terrestrial, aquatic, fossorial), and habits (diurnal, nocturnal) using skull morphology and/or teeth.

Key Point 2—Wildlife Ecology

Learning Objectives:

1. Know the meaning of "habitat," and be able to name the habitat requirements for wildlife and the factors that affect wildlife suitability.
2. Know and understand basic ecological concepts and terminology.
3. Understand the difference between an ecosystem, community and population. Be able to explain how communities interact with their non-living surroundings to form ecosystems.

4. Understand wildlife population dynamics such as birth, mortality, age-structure, sex ratio, and mating systems. Understand the impact of limiting and decimating factors of common wildlife species on wildlife management.
5. Recognize that all living things must be well-adapted to their native environment in order to survive. Be able to identify, describe and explain the advantages of specific anatomical, physiological and/or behavioral adaptations of wildlife to their environment.
6. Know the meaning of the term "biodiversity," and understand why biodiversity is important to people and wildlife.
7. Understand the importance of the 3 levels of biodiversity: genetics, species and ecosystem or community, and understand the implications of biodiversity loss at each level.

Suggested Activities:

1. Draw a map of an area and identify sources of food, water and shelter available to wildlife. Select a wildlife species and assess whether the area on your map will provide suitable habitat for this species. If any part of the habitat is lacking, explain what you could do to improve the habitat for this species?
2. Explain the relationship between the Pyramid of Numbers and the Pyramid of Biomass. Relate this exercise to an actual habitat to help you understand how much land area is needed to support life at each level of the food chain.
3. Create a detailed display to show examples of different types of food chains and illustrate the interdependence of organisms within a food web. Include terms such as tropic levels, predator, prey, scavengers, decomposers, omnivore, insectivore, herbivore, carnivore, producer, primary consumer, secondary consumer and tertiary consumer.
4. Explain the term "ecosystem" and give examples of different types of ecosystems. Describe a type of ecosystem and explain the importance of a keystone species. Draw food chains that include a specific keystone species and discuss what might happen if this species was removed from the food chain or if its population was diminished.
5. Select several wildlife species common to your area and list potential limiting and decimating factors for each. Visit a natural area, park, forest, and/or farm and assess the area to determine which of the limiting and decimating factors on your list would actually impact your selected species. For example, water may be a potential limiting factor, but the area you visit may have an abundance of water. Therefore, water would not be a limiting factor in this area and would have no impact.
6. Explain why Oregon is so diverse and explain what is being done to protect the biodiversity of wildlife. Include the following vocabulary to help you explain your answer: biodiversity, keystone species, native, endemic, habitat, biome, and food web.
7. Compare and contrast the behavioral and physiological adaptations of specific animals that live in two different environments. Explain why these animals are well-adapted to survive in their particular environment and include wildlife biology terms to describe specific

adaptations.

8. Web Lesson: Measuring Biodiversity across North America

   As a result of completing an investigation into the biodiversity of North American Mammals, students should develop an understanding of the concept of biodiversity, and learn ways to measure the diversity of organisms. In addition, students should become more familiar with the mammal communities and ecoregions in their residential areas and the biomes and ecoregions in Oregon.

9. Explain the three levels of biodiversity and give several reasons why biodiversity is important to wildlife and people. Select examples of species in your area that have become locally extinct and explain what causes loss of biodiversity. What can be done to gain biodiversity?

Key Point 3—Conservation and Management of Wildlife

Learning Objectives:

1. Know the preferred habitat types and specific habitat requirements of common wildlife species in Oregon. Understand how this knowledge helps us to better protect both the land and the wildlife species that depend on it.
2. Understand the difference between biological and cultural carrying capacity, and be able to identify social and ecological considerations where human use of land conflicts with wildlife habitat needs.
3. Identify common wildlife management practices and methods that are being used to manage and improve wildlife habitat in Oregon.
4. Understand the role of federal and state Fish and Wildlife Agencies in the management, conservation, protection, and enhancement of fish and wildlife and their habitats.

Suggested Activities:

1. Explain the meaning of the terms “migration route” and “flyway.” Know the four major North American flyways and understand the importance of these routes to migratory land, water and shore birds.
2. Determine which common wildlife species in your area depend on open land, woodland and wetland habitat for their survival. Identify the various types of habitats within open lands, woodlands, and wetlands, and explain the importance of these specific habitats to common wildlife species within your area.
3. Explain why human land use is the major cause of habitat loss. Provide examples of habitat destruction, fragmentation, and degradation and explain how wildlife species survival is threatened by habitat loss in Oregon.
4. Research and analyze controversial issues in order to understand the relationship between wildlife, economics and society.

5. Make a list of wildlife management practices and strategies that will restore or improve habitat for each of the following land uses: cropland, grassland, woodland, wetland, pond/lake, and urban setting (backyards, greenways, urban parks). Include specific wildlife species that will benefit from each wildlife practice or strategy.
6. Make a list of the Federal and State Fish and Wildlife Agencies within Oregon. Determine how each protects and manages the wildlife resources of your area, and describe activities and programs that are undertaken to protect and manage wildlife and their habitats.
7. Explain regulated trapping procedures and discuss the issues that are involved in trapping fur bearing animals. Research and explain the dilemma of biological carrying capacity vs. cultural carrying capacity in your discussion.
8. Explain how Wildlife Managers are using Satellite Remote Sensing, GPS and GIS in Conservation and Wildlife Management. Give an example explaining the benefits of using this technology in remote areas.

Key Point 4—Issues Involving Wildlife and Society

Learning Objectives:

1. Understand how non-native (exotic), invasive species threaten our environment and the biodiversity of many wildlife species. Understand that non-native (exotic), invasive plants impact wildlife habitat and thus have a tremendous impact on native wildlife.
2. Learn about the complexities of decision-making in land use situations that affect wildlife, and understand that wildlife resources are under constant pressure caused by human population growth, environmental degradation, and habitat reduction.
3. Know that wildlife species are subject to diseases resulting from exposure to microbes, parasites, toxins, and other biological and physical agents.
4. Understand the terminology and factors that affect threatened and endangered wildlife species. Know the meaning of extinct, extirpated, endangered, threatened, candidate species and reintroduction.
5. Identify the characteristics that many extinct and endangered species possess and be able

to identify many species of wildlife that are endangered and threatened.

6. Understand the role of the Endangered Species Act in helping to conserve endangered and threatened species. Know the organizations and agencies responsible for listing and protecting endangered species on global, federal and state levels.

Suggested Activities:

1. Give specific examples of non-native (exotic), invasive species in your area and describe how they have altered habitats, threatened ecosystems, and impacted wildlife. Explain what is being done to increase awareness and facilitate effective prevention and management of non-native (exotic) invasive species.
2. Explain the three major kinds of habitat loss. Give examples of how human activity is the biggest threat to wildlife habitat and also discuss how people can have a positive impact on wildlife habitat and biodiversity.
3. HIPPO is an acronym that represents the five major threats to biodiversity, which are caused by human activity. Design a poster to illustrate the HIPPO concept and factors that bring about the loss of biodiversity.
4. Name and describe two examples of diseases that are critically impacting wildlife and explain why controlling emerging wildlife diseases have become a high-priority concern in the United States. Explain the life cycles of these diseases and how they can be transmitted to humans.
5. Identify and describe factors that threaten and endanger wildlife species in your area. Explain what actions are being taken by various agencies and interest groups to improve the chance of survival for specific threatened and endangered species. Also, determine what practical measures private citizens can take to assist in the recovery of threatened and endangered species.
6. Select several endangered species and create a display to describe the characteristics that have made these species more vulnerable. Discuss state and federal efforts being taken to protect these species.

2025 Oregon Envirothon Current Issue

Roots and Resiliency: Fostering Forest Stewardship in a Canopy of Change

Introduction

Forests cover 31% of the world's land area, making their mark on the landscape and the lives of people all around the globe. In Oregon, nearly half (47%) of the land is covered by forests, and these wooded landscapes are an integral part of the identity and culture of Oregon. Since time immemorial, Indigenous peoples have made environmental stewardship a keystone to their ways of being and doing. All forests—including urban and community forests—continue to provide essential benefits such as economic vitality, societal well-being and ecological richness.

As the world studies climate change, the significance of our forests becomes even more pronounced. Worldwide, forests are experiencing impacts from extreme weather events due to a changing climate, which will result in changes to individual species and the ecosystem as a whole. Climate models suggest that Oregon's forests may experience a variety of changes over the next 75 years. Creating viable solutions for resilient forests will require examining traditional ways and knowledge of stewardship, as well as scientific innovations and techniques.

Roots and Resiliency: Fostering Forest Stewardship in a Canopy of Change invites students to examine current forest practices, identify where vulnerabilities may lie, and identify necessary adaptations. Students will learn how climate models can help predict the impacts of a changing climate on forests; how a changing climate will influence ecosystem shifts in Oregon; how these altered ecosystems are expected to impact Oregon's forest health; and how stewards of the land may need to continually adapt and expand their practices for sustainable forest management and resilience.

Key Topics and Objectives

Key Topic #1: Climate Change Projections

Learning Objectives:

1. Describe the causes of climate change, including the greenhouse effect.
2. Explain the impacts of climate change on Oregon's environment, as well as the social and economic impacts of climate change in Oregon.

3. Differentiate types of climate models and the various components that enable models to project future conditions.

Resources

NCF-Envirothon Resources: See pages 3-30 in the 2025 Envirothon Current Environmental Issue Study Resources guide.

Oregon Resources:

- Sixth Oregon Climate Assessment, 2023. Oregon Climate Change Research Institute. A biennial report on the impacts and risks of climate change in Oregon.
- Oregon Climate Change Research Institute**.** Charged by the Oregon State Legislature to assess the state of climate change science, including biological, physical and social science, as it relates to Oregon and the likely effects of climate change on the state.

Key Topic #2: Forest Health in a Changing Climate

Learning Objectives:

1. Describe how wildfire affects the hydrology, wildlife, and soils of forest communities.
2. Identify how increasing drought severity and frequency impacts forests ecosystems.
3. Describe how a current and changing climate affects the prevalence and severity of invasive insect species (e.g., Mountain pine beetle, Emerald ash borer, Mediterranean oak borer and Asian longhorn beetle) and diseases (e.g., Western gall rust, Armillaria root rot and needle casts) in all of Oregon's forests, including urban and community forests.
4. Explain how sustainable and active forest stewardship addresses the pressures of climate change in the areas of adaptation, mitigation and resiliency.

Resources

NCF-Envirothon Resources: See pages 31-53 in the 2025 Envirothon Current Environmental Issue Study Resources guide.

Oregon Resources:

- Climate Change and Carbon Plan, 2021. Oregon Department of Forestry. A plan for promoting climate-smart forestry policies and actions to advance climate change mitigation and adaptation goals.
- Fire in Oregon's Forests. Oregon Forest Resources Institute. An overview of the nature of fire in Oregon forests. See various links on this webpage to explore further.
- Fire Bright High School Curriculum. Southern Oregon Forest Restoration Collaborative. A set of lesson plans designed to help students gain a deep understanding of Oregon forests and wildfires.

- Forest Health. Oregon Department of Forestry. A round-up of updates and resources related to forest health in Oregon.
- Forest Health Highlights in Oregon, 2022. Oregon Department of Forestry. A report of damage and mortality in Oregon forests over the prior year, with updates on chronic issues.
- Threats to Our Forests. Oregon Forest Resources Institute. A webpage providing an overview of threats to the health of Oregon forests, including fire, drought, invasive pests and diseases. See various links on the webpage to explore further.
- Emerald Ash Borer. Oregon Department of Agriculture (ODA). A webpage with resources of the ODA on insect pest prevention and management.
- Mediterranean Oak Borer. ODA pest alert fact sheet on Mediterranean oak borer.

Other Resources:

- Monitoring Forest Health, in *Focus on Forests*. Project Learning Tree. A lesson plan in which students conduct a forest health checkup of a local forest area.
- Climate Change and Historical Forest Growth Changes in the US and Canada. National Council for Air and Stream Improvement. Fact sheet proving a brief overview of the effect of climate change on forest growth and how continuing changes may impact wood product supply.

Key Topic #3: Indigenous Knowledge and Relationship with the Land

Learning Objectives:

1. Identify similarities and differences between Indigenous worldviews and Western worldviews regarding land stewardship.
2. Describe how land-based learning and Indigenous Knowledge can contribute to improved land use, forest management and mitigation strategies.
3. Describe how Indigenous Knowledge and stewardship could be combined with Western science to develop a path toward making all forests more resilient to the threats they face.

Resources

NCF-Envirothon Resources: See pages 54-84 in the 2025 Envirothon Current Environmental Issue Study Resources guide.

Oregon Resources:

- Essential Understandings of Native Americans in Oregon. Oregon Department of Education. Information on the tribes in Oregon, including their past and current presence, sovereignty, history, tribal governance, identity, lifeways, and language.

- Prescribed Burns. Grand Ronde Tribal History Curriculum. High school lesson plan in which students about prescribed burns and the Grand Ronde Tribes' relationship with these types of burns.
- Siletz Today: Caring for Our Lands. Confederated Tribes of Siletz Indians Tribal History/Shared History Curriculum. Sixth grade lesson plan in which students explore the values of environmental stewardship in the collective experience and contemporary work of the Confederated Tribes of Siletz Indians.
- Tribal History/Shared History Curriculum. Oregon Department of Education. Lesson plans and resource regarding 2017 Oregon Senate Bill 13 (SB-13), which directed the Oregon Department of Education to create K-12 Native American curriculum for inclusion in Oregon public schools.

Other Resources:

- Braiding Indigenous and Western Knowledge for Climate-Adapted Forests: An Ecocultural State of Science Report. 2024. Report that brings together Indigenous Knowledge and Western Science to make recommendations for addressing the current challenges facing our nation's forests.

Key Topic #4: Vulnerability Assessments and Adaptation Strategies

Learning Objectives

1. Assess forest conditions and vulnerability to changes in climate.
2. Describe how different ecoregions in Oregon are affected by different levels of risk and what environmental factors cause those risks.
3. Describe how forest plants and animals respond to climate-related environmental changes.
4. Analyze the benefits and drawbacks of various climate change adaptation strategies to support sustainable forest management, including assisted species migration, selective breeding, and afforestation.

Resources

NCF-Envirothon Resources: See pages 85-114 in the 2025 Envirothon Current Environmental Issue Study Resources guide.

Oregon Resources:

- Climate Adaptation Strategies for Western Washington and Northwest Oregon Forests. Northwest Natural Resource Group. Describes different forest management strategies.

- Forest Health Highlights in Oregon, 2022. Oregon Department of Forestry. A report of damage and mortality in Oregon forests over the prior year, with updates on chronic issues.
- Sixth Oregon Climate Assessment, 2023. Oregon Climate Change Research Institute. A biennial report on the impacts and risks of climate change in Oregon.
- Oregon's Climate Change Adaptation Framework, Oregon Department of Land Conservation and Development. Explores the impacts of climate change in Oregon and identifies how state agencies can effectively respond to them
- Ecoregions of Oregon. Oregon Department of Fish and Wildlife. Map of the ecoregions found in Oregon.

Other Resources:

- How Do Managed Forests Contribute to Reducing Climate Change? National Council for Air and Stream Improvement. Fact sheet explains how managing forests to produce carbon-storing products and replacing fossil fuels increases long-term carbon benefits.

Key Topic #5: Legislation and Regulations

Learning Objectives

1. Describe federal and state regulations that help to ensure the sustainability of all forests in Oregon.
2. Explain how Oregon forest practice rules are similar to or different from those in other states.
3. Describe how Oregon's 20-Year Landscape Resiliency Strategy is striving to reduce wildfire risk and promote healthy and resilient landscapes.

Resources

NCF-Envirothon Resources: See pages 115-163 in the 2025 Envirothon Current Environmental Issue Study Resources guide.

Oregon Resources:

- Oregon Forest Facts & Figures. Oregon Forest Resources Institute. Provides accurate data, charts and graphs about Oregon's forests in an easy-to-access format.
- Oregon Forest Laws. Oregon Forest Resources Institute. Up-to-date information about the many laws that protect Oregon's public and private forests.
- Oregon's Forest Protection Laws: An Illustrated Manual 2024. Oregon Forest Resources Institute. Explains the Oregon Forest Practices Act and Rules, and the other best management practices, laws and rules that apply to Oregon's forest landowners.

- Laws and Regulations. U.S. Forest Service. Summary of federal laws related to forests in Oregon.
- Oregon's 20-Year Landscape Resiliency Strategy. Oregon Department of Forestry. Plan for improving Oregon's forests and rangelands to reduce fire risk.

Key Topic #6: Oregon Forests

Learning Objectives

1. Describe Oregon forest types and how the types are anticipated to shift based on climate change projections.
2. Identify ecosystem services provided by forest ecosystems in Oregon, including environmental, economic, social, and cultural values.
3. Identify fire-dependent species in Oregon (e.g., lodgepole pines, deerbrush, and Lewis's woodpeckers) and explain how climate change may enhance or threaten their populations.
4. Analyze the wildfire regime in Oregon's western and eastern forests, and describe how they are changing in response to climatic shifts.
5. Explain how forest certification can be used as a tool to manage Oregon's forests sustainably.
6. Describe how sustainably sourced wood from Oregon's forests is being used in innovative ways to meet society's housing and construction needs, while also storing carbon.

Resources

NCF-Envirothon Resources: None relevant, although you might be interested to see the resources for Canada's boreal forest on pages 164-198 in the 2025 Envirothon Current Environmental Issue Study Resources guide.

Oregon Resources:

- Inside Oregon's Forests: A High School Forestry Curriculum**.** Lesson plans about Oregon's forests, which include the environmental, social and economic importance of forests; forest types in Oregon; forest management; wildfire; climate change; and more.
- Oregon's Diverse Forests. Oregon Forest Resources Institute. Links to resources for exploring Oregon's forest types, including a *Forest Fact Break: Forest Types* video and an *Oregon's Forests* poster, available for order.
- Sourcing from Sustainable Forests. Oregon Forest Resources Institute. A report on sourcing forest products from Oregon's forests, including forest certification and other management tools, and how Oregon's forest practice laws are unique.
- Oregon Mass Timber Coalition. Information about mass timber construction.

OREGON ENVIROTHON

CURRENT ISSUE ORAL PRESENTATION 2025

Roots and Resiliency: Fostering Forest Stewardship in a Canopy of Change

Your team has been invited to submit a proposal for an updated forest management plan for the Meadow Creek Restoration Project. The Meadow Creek watershed is in the northeastern portion of the U.S. Forest Service's La Grande Ranger District in the Blue Mountains of Eastern Oregon. Prior management decisions, including decades of fire suppression and past timber harvest and livestock grazing, have left this area vulnerable to fire, disease, and insect pests, particularly in light of the stressors of a changing climate.

The project area is neighbors with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and is home to the Starkey Experimental Forest and Range research facility. The Tribes rely on the forest as a source of traditional First Foods, including salmon, steelhead, berries, deer and elk. The Starkey Experimental Forest and Range is used by scientists from around the world and is the primary field location for studying the effects of deer, elk and cattle on ecosystems within the Blue Mountains. As a federal public forest, the project area is also used by the general public for recreation and for non-timber forest products, including firewood, mushrooms, huckleberries and Christmas trees.

Your team's goal is to develop a forest management plan for the Meadow Creek watershed that will increase the sustainability of the forest and improve its provision of critical ecological services and resources, including traditional First Foods. Your plan should take into consideration climate change and its effects, best practices of forest management, Indigenous Traditional Ecological Knowledge, and the needs and rights of project area users and neighbors.

Your plan should include:

<u>Plan Background</u>

- The historic and current environmental conditions of the Meadow Creek project area.
- What essential resources and other benefits the project area currently provides or could provide.
- How climate change is expected to affect the project area and its surrounding area.
- Other natural and human-caused processes and management challenges affecting the project area.
- Project area neighbors and users.

- The needs and rights of project area neighbors and users.

Plan Details

- Your recommendation for restoring and enhancing the project area.
- How your plan will enhance fire resilience, wildlife habitat, grazing, and the sustainability of resources.
- The specific forest management strategies and tools you recommend and why.
- How your plan is informed by both western science and Indigenous Traditional Ecological Knowledge.
- How your plan will improve the project area's ability to provide essential resources in the face of future challenges, including how it will increase access to First Foods.
- Provisions for public engagement about the plan, including public education and public comments.
- Provisions for monitoring and evaluating plan outcomes to refine it over time.

Note that all forest management plans for federal lands undergo a process for ensuring that the plans meet federal regulations before any forest management occurs. Therefore, your plan does not need to specifically address federal regulations.

Please see the attached Project Overview for details about the project.

We look forward to reviewing your plan. The best proposal will be identified for further consideration by the U.S. Forest Service's Meadow Creek Restoration Project team.

Project Overview

The Meadow Creek Watershed Restoration Project consists of approximately 50,965 acres in the northeastern portion of La Grande Ranger District. It is in the Meadow Creek watershed of the Upper Grande Ronde River sub-basin. (See Figure 1.)

The project area is the home of the 23,734-acre Starkey Experimental Forest and Range, which is completely contained within it. The project area also has over 3 miles of shared boundary with private land. Several roads provide access to the project area.

The goal of the project is the long-term restoration of the watershed to improve the provision of First Foods and other critical ecological services. It will be based on an understanding of historic and current conditions, important natural and human-caused processes, and impacts on First Foods and other resources.

The project will be informed by western scientific information, incorporate the Confederated Tribes of the Umatilla Indian Reservation's *River Vision* and *Upland Vision*, and acknowledge the connection between Tribal Treaty rights and the recovery of salmon and steelhead populations.

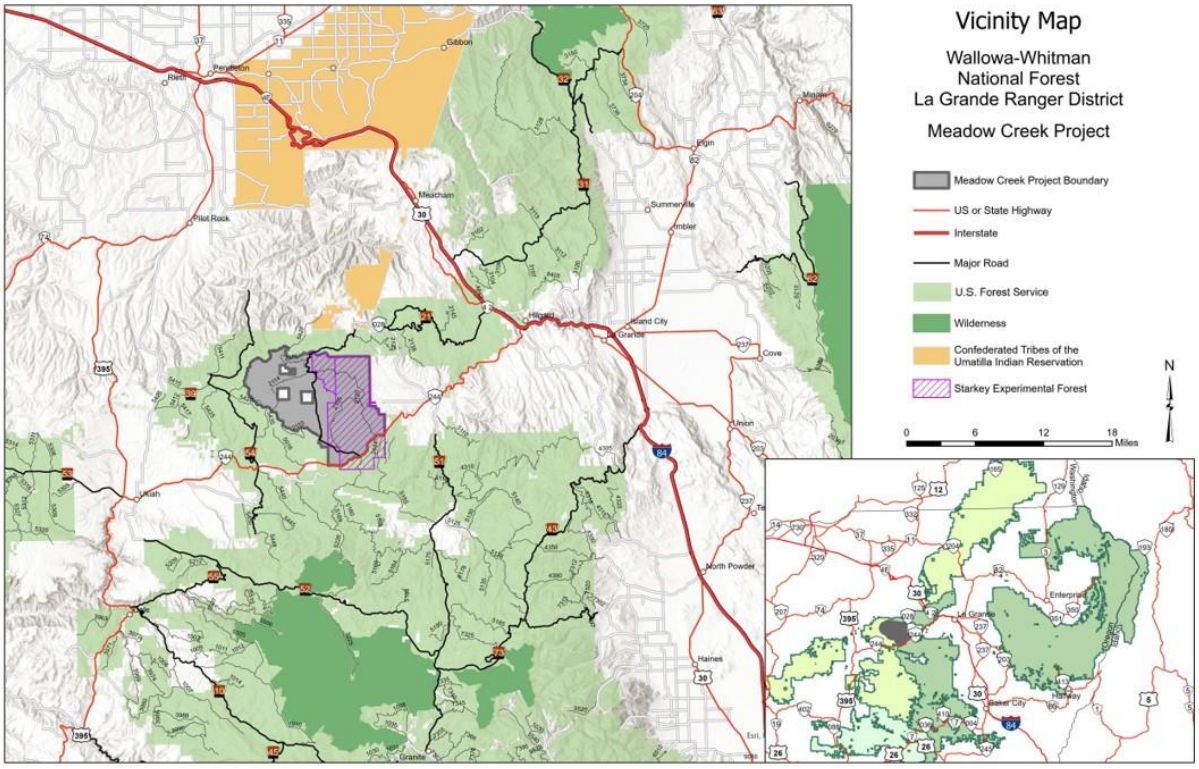

Figure 1- Meadow Creek Vicinity Map

Meadow Creek Project Area

The Meadow Creek Project Area consists of a mosaic of different forest and vegetation types, as shown in Table 1 below.

It reflects vegetation patterns shaped by past forest management, wildfires, and wildfire suppression activities. From about the 1910s to the 1980s, the forests were actively managed to suppress fires and extract resources. Then after that, there was a many-year period of minimal management. These past forest management approaches have led to dense forest stands that are susceptible to severe wildfire and other disturbances like insect outbreaks, diseases and drought.

Table 1—Meadow Creek Project Area Vegetation

Forest or Vegetation Type	Primary Species	Current Acreage	Percent of Project Area	Site Characteristics
Dry upland forests	Ponderosa pine Douglas-fir Grand fir	18,414 acres	36%	At mid to low elevations, usually on south- or east-facing slopes where moisture is limited. Frequent, low-intensity surface fires help create open landscapes with large, fire-resistant trees that are spaced widely apart.
Moist upland forests	Grand fir Ponderosa Pine Western larch Douglas-fir Subalpine fir	10,164 acres	20%	At mid to high elevations, usually facing north or west. Surface fires occur regularly or infrequently and burn with mixed intensity.
Cold upland forests	Mixed conifer Grand fir Western larch Lodgepole pine Subalpine fir Grand fir Englemann spruce	7,429 acres	15%	At high elevations with cooler temperatures. Surface fires occur infrequently and vary in intensity.
Woodland/shrubland & grasslands	Western juniper Idaho fescue Blue bunch wheat grass	14,958 acres	29%	At low and mid elevations, valley floors and ridgelines. Surface fires occur frequently and

	Sagebrush Mountain mahogany			are low in intensity.

Natural and Human Disturbances. Disturbances like fire play a key role in shaping and maintaining the diverse structure of the Meadow Creek landscape. When humans alter these natural disturbance patterns, landscapes can become simpler and more uniform, reducing plant diversity.

Years of fire suppression in the area have significantly changed the makeup of the forests across all types—dry, moist, and cold. Tree species that used to thrive with occasional fires, like ponderosa pine, lodgepole pine and western larch, have been largely replaced by species that are less tolerant to fire, like Douglas-fir and grand fir. The forest structure has also shifted from open spaces with scattered, single-layered trees to crowded, multi-layered forests that are more vulnerable to severe fire.

Forests have spread into areas that used to be grasslands, reducing the amount of grass available for grazing. There has also been a significant decrease in hardwood (deciduous) trees, especially near rivers and streams, leading to a loss of tree diversity and a reduced functioning of waterways. These changes have increased the amount of dry fuel material in the forests, making them much more prone to wildfires that are severe enough to burn entire forest stands, something that happened infrequently in the past. The majority of the project area is currently at a high risk for severe wildfires.

Insects and diseases have also altered the forests. In recent years, there have been widespread outbreaks of pests and diseases due to changes in tree species and other conditions, which have contributed to the decline of older trees and have affected the forest structure. The risk of severe outbreaks remains high for pests such as western spruce budworm, Douglas-fir tussock moth, Douglas-fir beetle, mountain pine beetle and western pine beetle.

Harvesting (logging) and other human activities have also impacted the forests. Harvesting operations have altered the species of trees, their size, how close they are to each other, the number of canopy layers or the overall structure of the forest. In areas where trees were harvested, large old trees were often replaced with young seedlings, either through planting or natural growth.

Traditional First Foods and Other Resources. Changes in the Meadow Creek watershed resulting from past forest management decisions have caused a decline in traditionally and ecologically important First Foods and other resources important to people with ancestral ties to the project area. There is now a need to restore balance to the ecosystem to support these culturally important foods, improve the natural processes that sustain them, and ensure clean, cold water for salmon, steelhead, and other aquatic species.

Local Economy. Communities in Northeast Oregon rely heavily on the area's natural resources and the infrastructure that supports resource management on public lands. Key industries like

forestry, ranching and recreation play a significant role in the local and regional economy. Public lands help keep these industries running by providing both resources and recreational opportunities. However, the region has seen a major decline in its timber industry over the past 25 years, with 17 mills and over 35 forest contractors closing. Today, Union County has only two sawlog mills and one particle board plant, while Wallowa County has a mill that processes green logs and some salvaged wood for firewood or biomass.

Multiple Uses. A large proportion of the project area is designated for "multiple use." People use the project area for recreation, like hunting, fishing, camping, and motorized or non-motorized activities. The project area is also used for grazing livestock. Many locals harvest non-timber forest products such as firewood, mushrooms, huckleberries, and Christmas trees, either for personal use or to sell, helping to support the local economy. Because of this, it's important to keep providing a mix of forest resources, from timber to recreation, to sustain the community's needs, and to allow for responsible use of revenue to reinvest into the forest.

Starkey Experimental Forest and Range. The Starkey Experimental Forest and Range is a one-of-a-kind, world-class research facility used by scientists from around the world. It is the primary field location for studying the effects of deer, elk, and cattle on ecosystems within the Blue Mountains. Interactions between cattle, elk and deer have been studied intensively since 1989 when approximately 25,000 acres were enclosed by an eight-foot-high big game fence. The area is managed by the Pacific Northwest lab and the Wallowa-Whitman National Forest. Oregon Department of Fish and Wildlife and Oregon State University are the primary research partners.

Resources

- Braiding Indigenous and Western Knowledge for Climate-Adapted Forests: An Ecocultural State of Science Report. 2024. Report that brings together Indigenous Knowledge and Western Science to make recommendations for restoring forest resilience.
- Climate Adaptation Strategies for Western Washington and Northwest Oregon Forests. Northwest Natural Resource Group. Describes different forest management strategies.
- First Foods and Life Cycles. Confederated Tribes of the Umatilla Indian Reservation.
- In This Together: A Collaborative Vision for Healthy Stream Habitats and First Foods. Article about the Meadow Creek Restoration Project.
- La Grande Ranger District and Wallowa-Whitman National Forest. USDA Forest Service.
- Priority Landscape Restoration. Umatilla National Forest. 2022. A story map of landscape restoration projects in the Umatilla and Wallowa-Whitman National Forests.
- River Vision. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources. 2011.

- Sixth Oregon Climate Assessment. 2023. Oregon Climate Change Research Institute. A biennial report on the impacts and risks of climate change in Oregon.
- Upland Vision. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources. 2019.

2025

Oregon Envirothon - Oral Presentation Score Sheet

Team Number	Judge's Initials	/100 Total Score

Scoring Criteria
0=Not at all
1=Poor or poorly
2=Fair or slightly well
3=Good or fairly well
4=Excellent or very well
5=Outstanding

Part I – Plan Background (30 Points maximum)

Circle one score for each item

A. The team demonstrated understanding of:							
a. The historic and current environmental conditions of the Meadow Creek project area.	0	1	2	3	4	5	
b. What essential resources and other benefits the project area currently provides or could provide.	0	1	2	3	4	5	
c. How climate change is expected to affect the project area and its surrounding area.	0	1	2	3	4	5	
d. Other natural and human-caused processes and management challenges affecting the project area.	0	1	2	3	4	5	
e. Project area neighbors and users.	0	1	2	3	4	5	
f. The needs and rights of project area neighbors and users.	0	1	2	3	4	5	
Part I Total:							**/30**

Part II – Plan Details (35 Points maximum)

Circle one score for each item

A. The team addressed or identified:							
a. Their recommended plan for restoring and enhancing the project area.	0	1	2	3	4	5	
b. How their plan will enhance fire resilience, wildlife habitat, grazing, and the sustainability of resources.	0	1	2	3	4	5	
c. The specific forest management strategies and tools they recommend and why.	0	1	2	3	4	5	
d. How their plan is informed by both western science and Indigenous Traditional Ecological Knowledge.	0	1	2	3	4	5	
e. How their plan will improve the project area's ability to provide essential resources in the face of future challenges, including increased access to First Foods.	0	1	2	3	4	5	
f. Provisions for public engagement about the plan, including public education and public comments.	0	1	2	3	4	5	
g. Provisions for monitoring and evaluating plan outcomes to refine it over time.	0	1	2	3	4	5	
Part II Total:							**/35**

Part III – Quality of Presentation (20 Points maximum)

Circle one score for each item

A. The presentation was well organized, with a clear introduction and strong conclusion.	0	1	2	3	4	5	
B. The participants enhanced the presentation (with eye contact, gestures, voice inflection, originality, professionalism, etc.).	0	1	2	3	4	5	
C. The visual aids were used to make major points and show conclusions. (Visual aids should be correct, eye-catching, readable, neat, etc.)	0	1	2	3	4	5	
D. The presentation had a logical flow, connecting topics with transition statements.	0	1	2	3	4	5	
Part III Total:							**/20**

Part IV – Required Elements (15 Points maximum)

Circle one score for each item

A. References: References and resources were provided or cited in the team presentation.	0	1	2	3	4	5	
B. Participation: Award one point for each team member who participated equally in the presentation.	0	1	2	3	4	5	
C. Time: Award points (as below) to indicate how effectively the team used their allotted time. Time limit is 11:00 minutes.	0	1	2	3	4	5	
1:00-2:59 min = **1 pt** 3:00-4:59 min = **2 pts** 5:00-6:59 min = **3 pts** 7:00-8:59 min = **4 pts** 9:00-11:00 min = **5 pts**							
PRESENTATION TIME: _____							
Part IV Total:							**/15**

Tips to Help You with Your Team Presentation

Record a video of your presentation and submit it to Oregon Envirothon, heath@ofri.org, by the due date of **April 18, 2025.**

Some useful tips to consider:

- Properly cite all references referred to in your presentation.
- Presentations are recommended to be 10 minutes in length. (The time limit is 10:59 minutes.)
- All team members should participate approximately equally.
- Plan the best format for your presentation. You may use software (such as PowerPoint), flip charts, props or other visual aids; organize your presentation as a public forum discussion; or use another format.
- Make any text large enough to read from a distance away.
- Judges' scoring is based on content, not the method of delivery.
- Refer to the Oral Presentation Score Sheet for scoring criteria.
- Practice your presentation, including transitions between speakers.
- Make your voice loud, clear and expressive. Try not to speak too rapidly or have constant body movement (which can distract from the content).
- Presentations should have three very recognizable sections: Introduction, Body and Conclusion**.** For example:
    - In the Introduction, have the team leader briefly summarize the problem or plan, state each objective, and name the person who will be presenting each objective.
    - In the Body, clearly outline and explain the information to meet the objectives.
    - In the Conclusion, restate the objectives and conclude with an obvious finish.

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