


Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: Ag, Food and Natural Resource Systems

 Cluster: Natural Resources Management

 Focus Area: **Forestry and Forest Products**

Industry-based knowledge and skill

Skill Type

FOR 01.01 Describe the ecological concepts and principles; investigate and explain the relationships between these principles and forest development.

Performance Indicators

Delivery Level

FOR 01.01.01	Identify biotic and wildland components of a forest ecosystem and explain their inter-relations.
FOR 01.01.01.01	Identify the food chain / food web of a typical forest.
FOR 01.01.01.02	Identify renewable and non-renewable resources in a forest ecosystem.
FOR 01.01.02	Describe anatomical and physiological plant characteristics and processes.
FOR 01.01.02.01	Explain the nutrient uptake of a plant (xylem and phloem).
FOR 01.01.02.02	Describe the growth and development of a plant.
FOR 01.01.02.03	Explain the process of photosynthesis.
FOR 01.01.02.04	Chart the process of transpiration; include notes.
FOR 01.01.02.05	Explain and illustrate shade tolerances among different tree species.
FOR 01.01.02.06	Explain the basic anatomy of plants.
FOR 01.01.02.07	Apply characteristics in nursery system practices and propagation.
FOR 01.01.03	Use the taxonomic classification to identify trees and shrubs.
FOR 01.01.03.01	Describe external plant characteristics.
FOR 01.01.03.02	Develop and use a dichotomous key.
FOR 01.01.03.03	Explain/illustrate the taxonomic structure.
FOR 01.01.03.04	Identify common Oregon plants to species.
FOR 01.01.03.05	Create a plant collection of important local species.
FOR 01.01.04	Identify and describe natural cycles and inter-relationships affecting forest growth and development.
FOR 01.01.04.01	Describe how carbon, oxygen, water, nutrients (nitrogen) cycles relate to forest growth and development.
FOR 01.01.04.02	Explain the process of forest succession and forest stand development.
FOR 01.01.04.03	Describe site adaptations including invasive species.
FOR 01.01.04.04	Identify/explain a keystone species and examine interrelationship of subsequence species.
FOR 01.01.04.05	Explain ecological interactions (e.g., population dynamics, food webs).
FOR 01.01.04.06	Evaluate soil profiles, land capability classes and soil conservation practices.

Industry-based knowledge and skill

Skill Type

FOR 05.01 Illustrate Oregon's diverse forests including history, cultural uses, forest types, policies, and industry.

Performance Indicators


Delivery Level

FOR 05.01.01	Describe or map forest types of Oregon.
FOR 05.01.01.01	Locate and describe the Spruce-hemlock forests and relevant facts.
FOR 05.01.01.02	Locate and describe the Douglas fir forests and relevant facts.
FOR 05.01.01.03	Locate and describe the mixed-conifer forests and relevant facts.
FOR 05.01.01.04	Locate and describe the sub alpine forests and relevant facts.
FOR 05.01.01.05	Locate and describe Juniper woodlands and relevant facts.
FOR 05.01.01.06	Locate and describe the Lodgepole Pine forests and relevant facts.
FOR 05.01.01.07	Locate and describe the Ponderosa Pine forests and relevant facts.
FOR 05.01.01.08	Explain the meaning of urban forests and identify where they are located.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

Performance Indicators


Delivery Level

FOR 05.01.02	Describe major trends in forest policy and associated socio-economic effect.
FOR 05.01.02.01	Explain the meaning of sustainability.
FOR 05.01.02.02	Compare and contrast the interpretations of “healthy” forests.
FOR 05.01.02.03	Identify global forestland trends.
FOR 05.01.02.04	Identify current state and federal legislation and map the trends over time.
FOR 05.01.02.05	Identify the affect of policy trends on timber harvests in Oregon in the last 50-80 years.
FOR 05.01.03	Identify land ownership and the corresponding management objectives.
FOR 05.01.03.01	Identify the owners.
FOR 05.01.03.02	Identify the long term goals and purpose.
FOR 05.01.03.03	Identify the key management strategies.
FOR 05.01.03.04	Forecast the long term effect(s) of these strategies.
FOR 05.01.04	Describe local, state and national historical individuals, events and the impact they had on forestry.
FOR 05.01.04.01	Research and document major events that had a significant effect on forest management at a local level.
FOR 05.01.04.02	Research and document major events that had a significant effect on forest management in Oregon.
FOR 05.01.04.03	Research and document major events that had a significant effect on forest management in the U.S. level.
FOR 05.01.04.04	Prepare a presentation to identify key figures who played a major role in forest management.
FOR 05.01.04.05	Identify the impact that the Tillamook Burn had on Oregon forestry policy and practices.
FOR 05.01.04.06	Identify the impact that Ed Schroeder had on Oregon forestry practices.
FOR 05.01.04.07	Develop an illustration that documents the historical use and management of forest systems. (e.g. native American, 1800’s to present)
FOR 05.01.05	Describe geographical, cultural, regional production uses of Oregon forest products.
FOR 05.01.05.01	Using an Oregon map, illustrate the dollar impact of lumber and wood products and employment by region or county.
FOR 05.01.05.02	Using an Oregon map, illustrate where various forest products are produced (e.g., lumber and engineered wood products, panel products/millwork, pulp paper and chemical products, playground equipment, wood crafts).
FOR 05.01.07	Identify a human impact on a natural resource.
FOR 05.01.07.01	Compare and contrast past activities vs. current practice with reference to soil compaction.
FOR 05.01.07.02	Compare and contrast past activities vs. current practice with reference to water management.
FOR 05.01.07.03	Compare and contrast past activities vs. current practice with reference to air quality.
FOR 05.01.07.04	Compare and contrast past activities vs. current practice with reference to fish and wildlife populations.
FOR 05.01.07.05	Compare and contrast past activities vs. current practice with reference to fire.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

Performance Indicators

Delivery Level

FOR 05.01.07.06	Compare and contrast past activities vs. current practice with reference to erosion.
FOR 05.01.08	Assess the social, ecological/environmental and economic effects of a forest management activity.
FOR 05.01.08.01	Discuss an impact(s) of the increased demand for forest products.
FOR 05.01.08.02	Examine and discuss the human pressure(s) on forestry systems.
FOR 05.01.08.03	Examine sustained yield of forest products in a green area.
FOR 05.01.09	Identify the historical use and management of forest systems. (e.g. native American, 1800's to present)
FOR 05.01.09.01	Identify the various historical tools used in forestry and explain / demonstrate their use.
FOR 05.01.09.02	Explain the use of fire as a management tool from a historical perspective.
FOR 05.01.09.03	Examine the different forestry management policies that have been enacted over and identify their affect.
FOR 05.01.09.04	Identify private and public land use practices and explain their impact on forest management.
FOR 05.01.09.05	Identify the various historical harvesting and processing techniques.
FOR 05.01.09.06	Explain how transportation and distribution of final forestry products have changed over time.

Industry-based knowledge and skill

Skill Type

FOR 05.02 Explain the human/natural resources relationships when implementing forest management activities.

Performance Indicators

Delivery Level

FOR 05.02.01	Describe a forest management activity.
FOR 05.02.01.01	Describe/illustrate reforestation techniques.
FOR 05.02.01.02	Identify different harvesting methods (past and present); explain where each method is most effective.
FOR 05.02.01.03	Investigate and evaluate different forest access methods.
FOR 05.02.01.04	Demonstrate techniques used for stream protection and riparian management.
FOR 05.02.01.05	Identify and recommend wildlife habitat enhancement techniques.
FOR 05.02.01.06	Develop a vegetative plan for improving wildlife habitat in urban areas.
FOR 05.02.01.07	Describe the procedure for an urban tree inventory.
FOR 05.02.01.08	Demonstrate proper tree planting/transplanting trees in the urban landscape.
FOR 05.02.01.09	Demonstrate proper tree pruning, trimming and fertilization techniques.
FOR 05.03.01	Identify the role of fire in the forest ecosystem.
FOR 05.03.01.01	Identify the different perspectives that have been held concerning forest fire policy.
FOR 05.03.01.02	Examine the concepts of prescribed fire in forest management practices.
FOR 05.03.01.03	Identify the techniques of prescribe fire in forest management practices.
FOR 05.03.01.04	Illustrate the concept of ecological succession in post forest fire regeneration.
FOR 05.04.01	Identify other uses of forest land
FOR 05.04.01.01	Explain the concept of eco-systems service (carbon banking, air quality)
FOR 05.04.01.02	Compare and contrast the multiple use principles of management (grazing, recreation, habitat)


Industry-based knowledge and skill

Skill Type

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

FOR 07.01 Demonstrate skills essential for leadership and citizenship responsibilities.

Performance Indicators

Delivery Level

FOR 07.01.01	Know and apply the essential elements of leadership and citizenship.
FOR 07.01.01.01	Identify different models of leadership; recommend the best model for a project, program or systemic change.
FOR 07.01.01.02	Identify the differences between systematic change and systemic change.
FOR 07.01.01.03	Demonstrate knowledge of a local, state and national political processes which affect change management.
FOR 07.01.01.04	Lead a team to accomplish an authentic community project.
FOR 07.01.01.05	Demonstrate the use of facilitation and consensus building techniques in resolving issues.
FOR 07.01.01.06	Identify legal and ethical issues relating to leading an authentic project.
FOR 07.01.01.07	Analyze a topic, present both pros and cons in written format.
FOR 07.01.01.08	Demonstrate the ability to speak in public in both extemporaneous and prepared situations using a forestry related topic.
FOR 07.01.01.09	Create a web page to present and interpret a forestry related topic area or phenomenon.
FOR 07.01.01.10	Adapt an interpretive program or site to accommodate people.
FOR 07.01.01.11	Develop an operational plan for an interpretive center.
FOR 07.01.01.12	Set up and staff a display booth during a community event.
FOR 07.01.01.13	Develop a public use area to explain forestry (display board, interpretive signs, brochures, ect, ect).
FOR 07.01.01.14	Participate as a facilitator during a public meeting.
FOR 07.01.01.15	Volunteer in a forestry management area.

Industry-based knowledge and skill

Skill Type

FOR 09.01 Demonstrate skills in career research, planning, and preparation.

Performance Indicators


Delivery Level

FOR 09.01.01	Identify potential careers in the field of forestry and the workforce projections for that career.
FOR 09.01.01.01	Conduct a search on sites such as Oregon Labor Market Information, Oregon's Career Information System (CIS), Oregon Forest Resources Institute (OFRI), etc.
FOR 09.01.01.02	Research and identify the knowledge, skills proficiencies and educational requirements to enter a specific career.
FOR 09.01.01.03	Prepare a personal index and opportunities of essential knowledge and skills relative to career needs.
FOR 09.01.02	Identify the educational venues where knowledge and skills can be developed in preparation for an identified career; assess potential costs, loans and scholarships for education at these venues.
FOR 09.01.02.01	Develop an index of scholarships and grants that may be available to support education and training.
FOR 09.01.02.02	Identify a career(s) to target in a personal/career plan.
FOR 09.01.02.03	Update and enhance the personal education/career plan with information as acquired.
FOR 09.01.02.04	Develop an extended learning activity to gain knowledge and skills in a career area of interest.
FOR 09.01.02.05	Develop a career related project that supports the acquisition of a skill or credential requirement for a specific career.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

Performance Indicators

Delivery Level

FOR 09.01.02.06 Examine the different Professional organizations lead to induction into the forestry profession.

Industry-based knowledge and skill

Skill Type

FOR 10.01 Document and describe forest production practices and timber processing procedures.

Performance Indicators

Delivery Level

FOR 10.01.01 Observe and investigate and explain silviculture processes including regeneration, tending and harvesting.

FOR 10.01.01.01 Compare and contrast the silvicultural practices of even and uneven aged tree stands.

FOR 10.01.01.02 Describe silvicultural techniques (e.g., thinning, cleaning, weeding and other intermediate treatments).

FOR 10.01.01.03 Describe harvesting systems (e.g., aerial, cable, ground based).

FOR 10.01.01.04 Describe the history of harvest system development in Oregon.

FOR 10.01.01.05 Discuss the process of regeneration including seed genetics, and free to grow.

FOR 10.01.02 Prepare presentations to describe how forest products are produced, harvested, processed and used.

FOR 10.01.02.01 Observe and document a working mill and a harvest site.

FOR 10.01.02.02 Describe historical utilization of wood (e.g., the early importance of spruce in WWI, Douglas-fir and Ponderosa Pine).

FOR 10.01.02.03 10.01.02.03 Describe the shift in forest products utilization to engineered and composite products.

FOR 10.01.02.04 Compare and contrast disadvantage and/advantage of wood products to alternatives (e.g., steel).

FOR 10.01.03 Compare and contrast technology, policy, social and market driven forces that affect forestry practices.

FOR 10.01.03.01 Describe how silviculture is science-based integration of social, economic, ecological and technological concerns.

FOR 10.01.03.02 Describe historical utilization of wood (e.g., the early importance of spruce in World War I, Douglas-fir and Ponderosa Pine).

FOR 10.01.03.03 Describe a market shift due to state and federal government policy/regulation changes (NAFTA, taxation, laws).

FOR 10.01.03.04 Describe the market shift due to changes in oil prices.

Industry-based knowledge and skill

Skill Type

FOR 10.02 Summarize and explain applications of appropriate forest health practices.

Performance Indicators

Delivery Level

FOR 10.02.01 Identify a forest protection issue and describe the relationship between forest protection and forest health.

FOR 10.02.01.01 Identify a significant forest protection issue in Oregon.

FOR 10.02.01.02 Select an interpretation of the term "forest health".

FOR 10.02.01.03 Describe the relationship between the issues and this specific definition of forest health.

FOR 10.02.02 Identify symptoms of threatening pest and disease infestations.

FOR 10.02.02.01 Identify the five (5) most potentially economically devastating insects and the symptoms of these infestations in Oregon.


FOR 10.02.02.02 Define native vs non-native (invasive species) and list examples.

FOR 10.02.02.03 Describe insect detection methods.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

Performance Indicators

Delivery Level

FOR 10.02.02.04	Discuss acceptable methods of controlling potential insect and pathogen infestations, including Integrated Pest Management.
FOR 10.02.03	Identify control measures for pest and disease infestations.
FOR 10.02.03.01	List control measures for insect and pathogen infestations.
FOR 10.02.03.02	Apply a recommended control measure to an infestation.
FOR 10.02.03.03	Monitor the outcomes of the treatment including record maintenance.
FOR 10.02.04	Identify and implement appropriate fire suppression tools and techniques.
FOR 10.02.04.01	Identify basic wildland fire suppression tools.
FOR 10.02.04.02	Demonstrate safe use of tools and equipment.
FOR 10.02.04.03	Describe the basic tactics used for fire suppression (mechanical direct attack) and the fire triangle.
FOR 10.02.04.04	Explain the difference between wildland fire suppression tactics and strategies.
FOR 10.02.04.05	Describe wildland fire firefighting safety concepts including standards for survival (e.g., LCES, standard fire orders and fire watch out situations).
FOR 10.02.04.06	Demonstrate personal fire prevention precautions while working in forest environments.
FOR 10.02.04.07	Participate in a wildfire prevention project.
FOR 10.02.04.08	Meet industry standards for fire suppression training (e.g., National Wildfire Coordinating Group Firefight Certification Standards).
FOR 10.02.05	List timber stand improvement strategies (silviculture methods) to address a forest health issues.
FOR 10.02.05.01	Identify a situation where there is an affect from a stand improvement strategy.
FOR 10.02.05.02	Discuss when and how to implement salvage.
FOR 10.02.05.03	Discuss when and how to implement thinning.
FOR 10.02.05.04	Discuss when and how to implement restorations.
FOR 10.02.05.05	Discuss when and how to implement weeding.
FOR 10.02.05.06	Discuss when and how to implement spraying.
FOR 10.02.05.07	Discuss when and how to implement fertilizer application.
FOR 10.02.05.08	Discuss when and how to implement pesticide application.
FOR 10.02.05.09	When and how to implement a controlled burn?
FOR 10.02.06	Develop a plan to address a forest health issue.
FOR 10.02.06.01	Identify the threat.
FOR 10.02.06.02	Identify forest landowner objectives.
FOR 10.02.06.03	Determine possible treatments and assess the social, economic and environmental outcomes.
FOR 10.02.06.04	Develop a list of actions, timelines, benchmarks and costs.
FOR 10.02.06.05	Create a method to evaluate the success of the project.

Industry-based knowledge and skill

Skill Type

FOR 10.03 Identify multi-use principles to forests and associated lands (to include wild life, fish, recreation, water, energy, air, carbon and ect).

Performance Indicators


Delivery Level

FOR 10.03.01	Demonstrate an awareness of forest recreation management.
FOR 10.03.01.01	Identify types of land ownership and ownership rights.
FOR 10.03.01.02	Discuss legal responsibilities for private and public land owners when land is used by the public.

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

Performance Indicators

Delivery Level

FOR 10.03.01.03	Discuss the loss and benefit of multiple uses.
FOR 10.03.01.04	Develop forest recreation management plan (e.g., user conflict, carrying capacity, impact).
FOR 10.03.01.05	Describe how recreational opportunities vary with ownership.
FOR 10.03.01.06	Develop an interpretation plan to describe a natural resource area (e.g., trail, materials signage).
FOR 10.03.02	Demonstrate an awareness of range land habitats, plants and animals, ecological succession, human uses.
FOR 10.03.02.01	Describe the relationships between rangeland plants and animals.
FOR 10.03.02.02	List plant requirements for optimum nutritional value (e.g., water, soil, and nutrients).
FOR 10.03.02.03	Explain over grazing and its effects on succession.
FOR 10.03.02.04	Develop a range management plan.
FOR 10.03.03	Demonstrate an awareness of water resources.
FOR 10.03.03.01	Diagram a local watershed location, boundaries and users.
FOR 10.03.03.02	Test and sample local water resource for water quality, etc.
FOR 10.03.03.03	Demonstrate stream enhancement techniques.
FOR 10.03.03.04	Use a stream classification system.
FOR 10.03.03.05	Describe the influence of weather and climatic factors.
FOR 10.03.03.06	Identify potential water pollution sources.
FOR 10.03.04	Demonstrate an awareness of special forest products.
FOR 10.03.04.01	Define/identify special forest products.
FOR 10.03.04.02	Identify specialty markets for forest products in the local area.
FOR 10.03.04.03	Identify local processors and wholesalers.
FOR 10.03.04.04	Evaluate historical consumer trends related to specialty products.
FOR 10.03.04.05	Forecast future demand of a specific special product.
FOR 10.03.04.06	Identify methods of harvesting of a special product.
FOR 10.03.04.07	Discuss the effects of special product harvesting on the eco-system.

Industry-based knowledge and skill

Skill Type

FOR 10.04 Apply cartographic (map) skills to forest management activities.

Performance Indicators

Delivery Level

FOR 10.04.01	Utilize map, compass reading, and related skills associated with forestry applications.
FOR 10.04.01.01	Monitor forest resource status and apply cartographic skills to obtain planning data to create a management plan.
FOR 10.04.01.02	Describe different types of maps.
FOR 10.04.01.03	Interpret map features and legend.
FOR 10.04.01.04	Determine map scale and actual distance.
FOR 10.04.01.05	Determine direction from a map.
FOR 10.04.01.06	Use directional tools with map to locate position.
FOR 10.04.01.07	Use land survey and coordinate system; determine percent (%) slope.
FOR 10.04.01.08	Use Geographic Information System (GIS) to interface and analyze resource data.
FOR 10.04.01.09	Conduct resource inventory and sample population studies.
FOR 10.04.01.10	Use sample plots and points.
FOR 10.04.01.11	Collect data concerning resource availability and health.
FOR 10.04.01.12	Prepare a technical report.


Industry-based knowledge and skill

Skill Type

Focus Area Level Report

Including Knowledge and Skills, and Performance Indicators



 Career Area: **Ag, Food and Natural Resource Systems**

 Cluster: **Natural Resources Management**

 Focus Area: **Forestry and Forest Products**

FOR 10.05

Apply forest mensuration techniques.

Performance Indicators

Delivery Level

FOR 10.05.01	Identify and use appropriate forestry tools used in mensuration (biltmore, clinometers, increment bore, foresters tape, ect, ect)
FOR 10.05.01.01	Monitor forest resource status and apply cartographic skills to obtain planning data to create a management plan.
FOR 10.05.01.02	Conduct resource inventory and sample population studies.
FOR 10.05.01.03	Use sample plots and points.
FOR 10.05.01.04	Conduct growth and volume yield analysis
FOR 10.05.01.05	Collect and interpret data concerning resource availability and health.
FOR 10.05.01.06	Prepare a technical report concerning data collected through forest mensuration..

Industry-based knowledge and skill

Skill Type

FOR 11.01

Prepare a business plan using accepted business management principles used in the production, processing, marketing and transportation of forest project / products.

Performance Indicators

Delivery Level

FOR 11.01.01	Incorporate economic principles to address the market structure and supply and demand of forest project / products.
FOR 11.01.01.01	Identify and develop value-added products.
FOR 11.01.01.02	Develop marketing and public relations campaigns.
FOR 11.01.01.03	Examine the entire cycle of production associated with forestry project / products.
FOR 11.01.02	Perform a cost benefit analysis for evaluation of a forest project / products.
FOR 11.01.02.01	Project income and expenses for production of a product.
FOR 11.01.02.02	Forecast economic trends that could affect the economic viability of the product.
FOR 11.01.03	Employ industry concepts and practices to manage inventory.
FOR 11.01.03.01	Maintain optimum inventory levels.
FOR 11.01.03.02	Apply just-in-time concepts.
FOR 11.01.03.03	Calculate costs of carrying inventory.
FOR 11.01.03.04	Perform logistics management.
FOR 11.01.03.05	Use technology and tools (e.g., word processors, spread sheets, data bases to keep accurate records for inventory).
FOR 11.01.04	Prepare accepted record keeping and accounting principles to accomplish business objectives.
FOR 11.01.04.01	Define and interpret financial statements.
FOR 11.01.04.02	Budget resources (e.g., capital, human, financial, time).
FOR 11.01.04.03	Manage assets for optimum utilization.
FOR 11.01.04.04	Evaluate credit uses and options.
FOR 11.01.04.05	Prepare and interpret financial statements (e.g., balance sheet, profit loss statement, cash flow statement).
FOR 11.01.04.06	Prepare tax forms (e.g., W-4, 19, Depreciation, 1099, Workers Compensation).
FOR 11.01.04.07	Determine cost of conducting business.
FOR 11.01.04.08	Compare and examine advantages and disadvantages of banking procedures (e.g., buy, lease, finance, risk).
FOR 11.01.04.09	Analyze investment options (e.g., buy, lease, finance, risks).
FOR 11.01.04.10	Manage risk of liabilities.