

# FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



## Forestry and Environmental Resource Management 1

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Board Approval Date:</b> Jan 23, 2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Course Length:</b> 2 Semesters                                                                                     |
| <b>Grading:</b> A-F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Credits:</b> 5 Credits per Semester                                                                                |
| <b>Proposed Grade Level(s):</b> 10, 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Subject Area:</b> Interdisciplinary Science<br><b>Elective Area (if applicable):</b><br>Career Technical Education |
| <b>Prerequisite(s):</b><br>Successful completion of or concurrent enrollment in Integrated Math 1. Successful completion of Agriscience 1 or Biology of the Living Earth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Corequisite(s):</b><br>N/A                                                                                         |
| <b>CTE Sector/Pathway:</b> Agriculture and Natural Resources/ Forestry and Natural Resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                       |
| <b>Intent to Pursue 'A-G' College Prep Status:</b> Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                       |
| <b>A-G Course Identifier:</b> (d) Laboratory Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                       |
| <b>Graduation Requirement:</b> No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                       |
| <b>Course Intent:</b> Site Specific<br><b>Program (if applicable):</b> CTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                       |
| <p>The Folsom Cordova Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person's actual or perceived ancestry, color, disability, race or ethnicity, religion, gender, gender identity or gender expression, immigration status, national origin, sex, sexual orientation, or association with a person or group with one or more of these actual or perceived characteristics. For concerns/questions or complaints, contact the Title IX Coordinator(s), Equity Compliance Officer(s) and Section 504 Coordinator(s) :</p> <p><b>Donald Ogden, Associate Superintendent – Human Resources, Title IX Coordinator (Employees) &amp; Equity Compliance Officer</b><br/>dogden@fcusd.org<br/>916-294-9000 Ext 104410</p> <p><b>Jim Huber Ed. D., Assistant Superintendent – Educational Services, Title IX Coordinator (Students), Section 504 Coordinator &amp; Equity Compliance Officer</b><br/>jhuber@fcusd.org<br/>916-294-9000 Ext 104625</p> |                                                                                                                       |

## COURSE DESCRIPTION:

The Earth's population is growing at an unprecedented rate, driving an ever-increasing demand for resources, which makes responsible resource management more crucial than ever. Among these resources, forests play an irreplaceable role in sustaining both the environment and human life. Forests provide essential ecological services, supporting wildlife habitats, regulating the climate, and offering products like timber, paper, and even food.

## DETAILED UNITS OF INSTRUCTION:

| Unit Number/Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Unit Essential Questions                                                                                                           | Examples of Formative Assessments                                                                                                                                                                                                                                            | Examples of Summative Assessment                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Introduction to Natural Resource Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | What are the different types of natural resources, and how are they categorized (biotic vs. abiotic, renewable vs. non-renewable)? | <ul style="list-style-type: none"><li>● Students will provide thoughts about the global population and the rate of increase</li><li>● Students will study cultures and their perspectives on population dynamics</li><li>● Students will calculate and graph rates</li></ul> | <ul style="list-style-type: none"><li>● Students will use data to draw conclusions and propose solutions to population related issues</li></ul>                                                |
| <b>Unit 1 Essential Standards:</b><br>D1.0: Understand natural resource management in relation to ecological functions.<br>D2.0: Understand the impact of human population growth and urbanization on natural resources.<br>HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.<br>HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.<br>HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. |                                                                                                                                    |                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                |
| <b>2. History of Natural Resource Conservation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | What is silviculture, and how does it contribute to the health and maintenance of forest ecosystems?                               | <ul style="list-style-type: none"><li>● Timber Stand Improvement Lab</li></ul>                                                                                                                                                                                               | <ul style="list-style-type: none"><li>● Students will research and discuss the California Forest Practice Act and the requirements for Timber Harvest and Habitat Conservation Plans</li></ul> |

**Unit 2 Essential Standards:**

D3.0: Understand the historical and contemporary roles of natural resource conservation.

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

HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

**3. Introduction to Forestry**

How does the management of forest resources impact the overall health of natural ecosystems and the communities that rely on them?

- Dichotomous Key Activity: Students will use a dichotomous key to identify ten plant species on campus

- Students will identify trees and know where they grow in California (growth characteristics, relative lumber value, and the forest products made from them)
- Students will produce a display of their knowledge

**Unit 3 Essential Standards:**

D1.0: Understand natural resource management in relation to ecological functions.

D4.0: Understand the roles of forest resources in both environmental and economic contexts.

HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

**4. Forest Ecosystems**

What are food webs, ecological succession, competition, adaptation, and symbiosis, and how do these concepts help us understand the complexity of forest ecosystems?

- Wildlife Dynamics Population Survey Lab

- Case Study Analysis: Write a case study on a forest ecosystem that underwent ecological succession, including analysis of how abiotic and biotic factors influenced the transition

**Unit 3 Essential Standards:**

D1.0: Understand natural resource management in relation to ecological functions.

D5.0: Understand the roles of wildlife and their management in forest ecosystems.

HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-4: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

**5. Measuring and Monitoring the Forest**

How do professionals utilize modern tools to monitor forest health?

- Forest Inventory Exercise: Students conduct a mock forest inventory in class or online, measuring tree height, diameter, and identifying species

- Forest Management Plan: Students create a forest management plan for a given area, including data collection on species, soil profile, and threats like pests or fire risk

**Unit 4 Essential Standards:**

D2.0: Understand the role of monitoring and managing natural resources.

D4.0: Understand the roles of forest resources in both environmental and economic contexts.

HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-LS2-3: Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

**6. Forest Management**

What natural threats, such as fires, pests, and diseases, impact forests, and how can these threats contribute to or disrupt forest ecosystems?

- Field Data Collection: During a field trip or virtual tour, students collect data (e.g., species composition, soil profile) to inform a forest management plan

- Damaged Tree Project: Students will identify and diagnose damage from destructive insects, diseases, and weather and utilize information to choose methods for managing a timber stand

**Unit 6 Essential Standards:**

D2.0: Understand the role of monitoring and managing natural resources.

D5.0: Understand the roles of wildlife and their management in forest ecosystems.

HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

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

HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

|                                        |                                                                                                                 |                                                                                                                                                                                          |                                                                                                                                                                                                                                               |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>7. Mapping and Land Description</b> | What methods and tools are used to accurately locate, measure, and describe specific sections of forested land? | <ul style="list-style-type: none"><li>● Pacing Areas Activity: Students will build on prior knowledge of pacing and basic geometry to determine the acres of a marked off area</li></ul> | <ul style="list-style-type: none"><li>● Fun with Surveying Equipment: Students will use surveying equipment, including global positioning satellites, maps, and a compass, to determine area, boundaries, and elevation differences</li></ul> |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Unit 7 Essential Standards:**

D2.0: Understand the role of monitoring and managing natural resources.

D6.0: Understand the tools and technologies used in natural resource management.

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

HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

|                               |                                                                                                              |                                                                                                                                                                                          |                                                                                                                                                                                                                                             |
|-------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>8. Wildlife Management</b> | What is wildlife management, and why is it important for sustaining healthy, multiple-use forest ecosystems? | <ul style="list-style-type: none"><li>● Wildlife Observation Journal: Students observe wildlife in a local area and document species, habitat conditions, and possible threats</li></ul> | <ul style="list-style-type: none"><li>● Wildlife Management Plan: Students design a wildlife management plan for a forested area, focusing on the balance between ecosystem health and human activity (e.g., hunting, recreation)</li></ul> |
|-------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Unit 8 Essential Standards:**

D5.0: Understand the roles of wildlife and their management in forest ecosystems.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                       |                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.</p> <p>HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</p> <p>HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.</p>                                                                                                                                                                           |                                                                                                                                                       |                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                |
| <p><b>9. Wildland Fire Management</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>Why is it important to develop land management and wildfire protection systems that prioritize safety, consistency, and cost-effectiveness?</p>    | <ul style="list-style-type: none"> <li>● Fire Impact Case Study: Students research and present a case study of a major wildfire, analyzing its ecological impact, causes, and management response</li> </ul> | <ul style="list-style-type: none"> <li>● Wildland Fire Management Plan: Research a local site (e.g., high school campus, off-grid neighborhoods) and create a wildland fire management plan. Present information to a community group</li> </ul>               |
| <p><b>Unit 9 Essential Standards:</b></p> <p>D2.0: Understand the role of monitoring and managing natural resources.</p> <p>D6.0: Understand the tools and technologies used in natural resource management.</p> <p>HS-ESS3-2: Evaluate competing design solutions for developing fire protection systems that balance environmental, economic, and safety concerns.</p> <p>HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.</p> <p>HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</p> |                                                                                                                                                       |                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                |
| <p><b>10. Commercial Forest Resources</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>What role do industries like construction and furniture play in the demand for timber, and how do economic downturns affect the timber market?</p> | <ul style="list-style-type: none"> <li>● Lumber Species Identification Lab: Students will learn the identifying characteristics of different species of lumber and be able to identify them</li> </ul>       | <ul style="list-style-type: none"> <li>● Economic Impact Analysis: Students write an essay analyzing the economic impact of the timber industry on local communities, considering factors like job creation, market demand, and international trade</li> </ul> |
| <p><b>Unit 10 Essential Standards:</b></p> <p>D4.0: Understand the roles of forest resources in both environmental and economic contexts.</p> <p>D6.0: Understand the tools and technologies used in natural resource management.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                       |                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.</p> <p>HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.</p> <p>HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.</p>                                                                                                  |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |
| <b>11. Forest Recreation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>What is the role of forest recreation management, and why is it important for providing quality outdoor experiences?</p>               | <ul style="list-style-type: none"> <li>Environmental Impacts of Forest Recreation Research Project: Students will research the potential environmental impacts of recreational activities and describe how to manage the resources affected. They will present their findings in a multimedia slideshow or video</li> </ul> | <ul style="list-style-type: none"> <li>Outdoor Recreation and Safety: Students will select a forest recreation activity and present basic knowledge of the activity, non-profit groups organized to promote the activity and how to be safe during the activity</li> </ul> |
| <p><b>Unit 11 Essential Standards:</b></p> <p>D4.0: Understand the roles of forest resources in both environmental and economic contexts.</p> <p>D7.0: Understand the social and community aspects of natural resource management.</p> <p>HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.</p> <p>HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.</p> <p>HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</p> |                                                                                                                                           |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                            |
| <b>12. Forest Management Plan</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>What are the key components of a comprehensive forest management plan, and how do they contribute to sustainable land stewardship?</p> | <ul style="list-style-type: none"> <li>Draft Plan Feedback: Students submit a draft of their forest management plan for peer review and instructor feedback</li> </ul>                                                                                                                                                      | <ul style="list-style-type: none"> <li>Final Forest Management Plan Presentation: Students present their comprehensive forest management plans, justifying their strategies based on ecological data, landowner objectives, and sustainability principles</li> </ul>       |

**Unit 12 Essential Standards:**

D2.0: Understand the role of monitoring and managing natural resources.

D6.0: Understand the tools and technologies used in natural resource management.

D7.0: Understand the social and community aspects of natural resource management.

HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

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

**RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:****Link to Common Core Standards (if applicable):**

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

**Link to Framework (if applicable):**

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

**Link to Subject Area Content Standards (if applicable):**

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/ci/ct/sf/documents/agnatural.pdf>

**Link to Program Content Area Standards (if applicable):**

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

<https://www.cde.ca.gov/ci/ct/sf/documents/ctestdfontpages.pdf>

**TEXTBOOKS AND RESOURCE MATERIALS:****Textbooks**

| Board Approved | Pilot Completion Date (If applicable) | Textbook Title                                    | Author(s)                            | Publisher        | Edition     | Date     |
|----------------|---------------------------------------|---------------------------------------------------|--------------------------------------|------------------|-------------|----------|
| Yes            |                                       | <i>Managing our Natural Resources 5th Edition</i> | William Camp-<br>Betty Heath<br>Camp | Cengage Learning | 5th Edition | 1/1/2009 |

|                                                                      |  |                                                                                                |                                                                      |                                        |             |          |
|----------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------|-------------|----------|
| <i>This text will be approved with the approval of this outline.</i> |  | <i>Principles of Agriculture, Food and Natural Resources 2nd Edition *Digital availability</i> | John S. Rayfield, Kasee L. Smith, Travis D. Park, and D. Barry Croom | Goodheart-Willcox Publishing (G-W Inc) | 2nd Edition | 1/1/2023 |
|----------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------|-------------|----------|