CareerClusters®
PATHWAYS TO COLLEGE & CAREER READINESS
Agriculture, Food & Natural Resources

Learning that works for Colorado CTE®

Colorado AFNR Course Scope and Sequence

Course Name	**Wildlife & Fish Management**		**Course Details** **Course = 0.50 Carnegie Unit Credit**	Level 3 course in the Natural Resources/Environmental Science Pathway	
Course Description	This course expands student learning to the principles of wildlife management. Students will gain knowledge in career development, leadership, personal development, communications, ecology, biology, zoology, and trends in wildlife management in relation to outdoor recreation.				
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.				
SCED Identification #	18310	Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.			
All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at **https://www.cde.state.co.us/standardsandinstruction/essentialskills**					
Unit Number, Title and Brief Description	Suggested % of Instructional Time	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Unit 1: Analyze the different elements in an Ecosystem and the relationship of those interactions in relation to Wildlife Management	8%	**NRS.01.** Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	**NRS.01.01.** Apply methods of classification to examine natural resource availability and ecosystem function in a particular region. *ELA: RST.11-12.1* *RST.11-12.8* *WHST.9-10.2* *WHST.11-12.2* *WHST.9-10.9* *WHST.11-12.9*	**NRS.01.01.01.a.** Summarize and classify the different kinds of natural resources using common classification schemes (e.g., living versus non-living, renewable versus nonrenewable, native versus introduced, etc.). **NRS.01.01.02.a.** Summarize the components that comprise all ecosystems. **NRS.01.01.02.b.** Analyze the interdependence of organisms within an ecosystem (e.g., food	

				webs, niches, impact of keystone species, etc.) and assess the dependence of organisms on nonliving components (climate, geography, energy flow, nutrient cycling, etc.). **NRS.01.01.02.c.** Conduct analyses of ecosystems and document the interactions of living species and non-living resources. **NRS.01.01.03.b.** Analyze how biodiversity develops through evolution, natural selection and adaptation; explain the importance of biodiversity to ecosystem function and availability of natural resources. **NRS.01.01.03.c.** Evaluate biodiversity in ecosystems and devise strategies to enhance the function of an ecosystem and the availability of natural resources by increasing the level of biodiversity.	
Unit 2: Identifying different species and variety of plants and the impact of the health of the ecosystem.	10%	**NRS.01.** Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	**NRS.01.02.** Classify different types of natural resources in order to enable protection, conservation, enhancement and management in a particular geographical region. *ELA: RST.11-12.1* *RST.11-12.7* *RST.11-12.8*	**NRS.01.02.03.a.** Research and examine the characteristics used to identify wildlife and insects. **NRS.01.02.03.b.** Apply identification techniques to determine the species of wildlife or insect.	

			WHST.9-10.2 *WHST.11-12.2* *WHST.9-10.7* *WHST.11-12.7* *WHST.9-10.9* *WHST.11-12.9* *MATH: MA.HS.N.Q.A* *SCIENCE: SC.HS.3.9*	**NRS.01.02.03.c.** Evaluate the species of wildlife and insects present to assess the health of an ecosystem. **NRS.01.02.04.a.** Research and examine the characteristics used to identify aquatic species. **NRS.01.02.04.b.** Apply identification techniques to determine the species of an aquatic organism. **NRS.01.02.04.c.** Evaluate the aquatic species present to assess the health of an ecosystem.	
		NRS.04. Demonstrate responsible management procedures and techniques to protect, maintain, enhance, and improve natural resources.	**NRS.04.01.** Demonstrate natural resource protection, maintenance, enhancement and improvement techniques. *ELA: RST.11-12.8* *RW.H2.1.2* *SCIENCE: SC.HS.3.9* *SC.HS.3.11*	**NRS.04.01.03.a.** Identify and categorize characteristics of a healthy wildlife habitat. **NRS.04.01.03.b.** Assess and apply methods of wildlife habitat improvement. **NRS.04.01.03.c.** Devise a comprehensive improvement plan for a wildlife habitat.	
Unit 3: Understand the relationship biogeochemical cycles impact on wildlife habitat and Aquatic ecosystems	8%	**NRS.01.** Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	**NRS.01.02**. Classify different types of natural resources in order to enable protection, conservation, enhancement and management in a particular geographical region. *ELA: RST.11-12.1* *RST.11-12.7*	**NRS.01.02.05.a.** Research and examine the characteristics used to identify non-living resources (e.g., soil types, climate, geography, etc.). **NRS.01.02.05.b.** Apply identification techniques to	

			RST.11-12.8 *WHST.9-10.2* *WHST.9-10.2* *WHST.9-10.7* *WHST.11-12.7* *WHST.9-10.9* *WHST.11-12.9* *MATH: MA.HS.N.Q.A* *SCIENCE: SC.HS.3.9* **NRS.01.03.** Apply ecological concepts and principles to atmospheric natural resource systems. *ELA. RST.11-12.1* *RST.11-12.7* *RST.11-12.8* *MATH: MA.HS.N.Q.A* *MA.HS.S.ID.A* *MA.HS.S.IC.A.* *MA.HS.S.IC.B* *SCIENCE: SC.HS.3.4* *SC.HS.3.7* *SC.HS.3.11* *SC.HS.3.12*	determine the types of non-living resources in an area. **NRS.01.02.05.c.** Evaluate the non-living resources present in an area to determine the best practices for improving, enhancing and protecting an ecosystem. **NRS.01.03.01.a.** Classify different kinds of biogeochemical cycles and the role they play in natural resources systems. **NRS.01.03.01.b**. Assess the role that the atmosphere plays in the regulation of biogeochemical cycles. **NRS.01.03.01.c.** Evaluate and make recommendations to lessen the impact of human activity on the ability of the atmosphere to regulate biogeochemical cycles.	
Unit 4: Evaluating Wildlife habitat in relationship to ecology	8%	**NRS.01.** Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	**NRS.01.05.** Apply ecological concepts and principles to terrestrial natural resource systems. *ELA: RST.11-12.1* *RST.11-12.7* *RST.11-12.8* *MATH: MA.HS.S.ID.A* *MA.HS.S.IC.A* *MA.HS.S.IC.B*	**NRS.01.05.02.a.** Compare and contrast the impact of habitat disturbances and habitat resilience. **NRS.01.05.02.b.** Analyze and summarize examples of habitat disturbances and habitat resilience.	

			SCIENCE: SC.HS.3.11 *SC.HS.3.9*	**NRS.01.05.02.c.** Interpret signs of habitat disturbances and resilience in an ecosystem and use these signs to assess the health of an ecosystem.	
Unit 5: Understanding the roles of resource inventories and populations in wildlife management	8%	**NRS.01.** Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.	**NRS.01.02.** Classify different types of natural resources in order to enable protection, conservation, enhancement and management in a particular geographical region. *ELA: RST.11-12.1* *RST.11-12.7* *RST.11-12.8* *WHST.9-10.2* *WHST.11-12.2* *WHST.9-10.7* *WHST.11-12.7* *WHST.9-10.9* *WHST.11-12.9* **NRS.01.06.** Apply ecological concepts and principles to living organisms in natural resource systems. *ELA: RST.11-12.1* *RST.11-12.8* *WHST.9-10.2* *WHST.11-12.2* *WHST.9-10.5* *WHST.11-12.5* *WHST.9-10.7* *WHST.11-12.7* *WHST.9-10.9* *WHST.11-12.9* *SCIENCE: SC.HS.2.12* *SC.HS.2.13* *SC.HS.3.11*	**NRS.01.02.06.a.** Research the purpose and value of resource inventories and population studies. **NRS.01.02.06.b.** Apply procedures for conducting resource inventories and population studies. **NRS.01.02.06.c.** Conduct an assessment of the resource inventories or population in a given area. **NRS.01.06.01.a.** Differentiate between population ecology, population density and population dispersion and describe the importance of these concepts to natural resource systems. **NRS.01.06.01.b.** Analyze the factors that influence population density and population dispersion in natural resource systems. **NRS.01.06.01.c.** Create a management plan for a population of a species in an ecosystem given its	

				population ecology, population density and population dispersion in natural resource systems.	
Unit 5: Exploring the relationship between Government Agencies, human interactions, and Wildlife Management	8%	**NRS.02.** Analyze the interrelationships between natural resources and humans.	**NRS.02.01.** Examine and interpret the purpose, enforcement, impact and effectiveness of laws and agencies related to natural resource management, protection, enhancement and improvement (e.g., water regulations, game laws, historic preservation laws, environmental policy, etc). **NRS.02.03.** Analyze how modern perceptions of natural resource management, protection, enhancement, and improvement change and develop over time.	**NRS.02.01.01.a.** Distinguish between the types of laws associated with natural resources systems. **NRS.02.01.01.b.** Analyze the structure of laws associated with natural resources systems. **NRS.02.01.01.c.** Evaluate the impact of laws associated with natural resources systems (e.g., mitigation, water regulations, carbon emissions, game limits, invasive species, etc.). **NRS.02.03.02.a.** Research and assess how historical figures played a prominent role in shaping how natural resources are viewed and used today (e.g., Aldo Leopold, Teddy Roosevelt, John Muir, Rachel Carson, Gaylord Nelson, etc.). **NRS.02.03.02.b.** Examine and describe the relationship between current trends in natural resource systems and historical figures that played a prominent role in shaping how natural resources are viewed and used today.	

				NRS.02.03.02.c. Anticipate and predict how society's views and use of natural resources will continue to change as a result of historical figures and trends in modern society.	
Unit 6: Analyzing the Economic impact of Wildlife Management	8%	**NRS.02.** Analyze the interrelationships between natural resources and humans.	**NRS.02.04.** Examine and explain how economics affects the use of natural resources. *ELA: RST.11-12.1* *RST.11-12.7* *RST.11-12.8* *WHST.11-12.2* *WHST.11-12.7* *WHST.11-12.8* *WHST.11-12.9* *RW.H2.1.2* *SCIENCE: SC.HS.3.9*	**NRS.02.04.01.a.** Compare and contrast how the economic value of a natural resource affects its availability. **NRS.02.04.01.b.** Assess whether economic value increases or decreases the conservation, protection, improvement and enhancement of natural resources. **NRS.02.04.01.c.** Devise a plan to improve the conservation, protection, improvement and enhancement of natural resources based on economic value and practices. **NRS.02.04.02.a.** Research the impact of the use of natural resources on local, state and national economies (e.g., outdoor recreation, energy production, preservation, etc.).	

		NRS.03. Develop plans to ensure sustainable production and processing of natural resources.	**NRS.03.01.** Sustainably produce, harvest, process and use natural resource products (e.g., forest products, wildlife, minerals, fossil fuels, shale oil, alternative energy, recreation, aquatic species, etc.). *ELA: RST.11-12.8* *SCIENCE: SC.HS.3.9 SC.HS.3.11*	**NRS.02.04.02.b.** Assess the importance of the use of natural resources on local, state and national economies. **NRS.02.04.02.c.** Anticipate and predict how changes to the availability of natural resources because of human activity may impact a local, state and national economy. **NRS.03.01.02.a.** Research and describe methods by which wildlife can be sustainably harvested (e.g., controlled harvests, hunting licenses, regulations, etc.). **NRS.03.01.02.b.** Assess and apply techniques used to harvest wildlife in regards to sustainability, practicality and other factors. **NRS.03.01.02.c.** Develop a method for the sustainable harvest of wildlife species. **NRS.03.01.08.a.** Categorize aquatic species used for commercial and recreational purposes. **NRS.03.01.08.b.** Analyze and apply techniques used to acquire aquatic species for their environmental,	

				economic and social sustainability. **NRS.03.01.08.c.** Develop recommendations for the sustainable harvest of aquatic species.	
Unit 7: analyze the harms to wildlife with the introduction of invasive species and diseases	8%	**NRS.04.** Demonstrate responsible management procedures and techniques to protect, maintain, enhance, and improve natural resources.	**NRS.04.01.** Demonstrate natural resource protection, maintenance, enhancement and improvement techniques. *ELA: RST.11-12.8* *RW.H2.1.2* *SCIENCE: SC.HS.3.9* *SC.HS.3.11* **NRS.04.02.** Diagnose plant and wildlife diseases and follow protocols to prevent their spread. *ELA: RST.11-12.7* *RST.11-12.8* *WHST.11-12.2* *WHST.11-12.7* *WHST.11-12.8* *WHST.11-12.9* *MATH: MA.HS.N.Q.A* *SCIENCE: SC.HS.2.6*	**NRS.04.01.03.a.** Identify and categorize characteristics of a healthy wildlife habitat. **NRS.04.01.03.b.** Assess and apply methods of wildlife habitat improvement. **NRS.04.01.03.c.** Devise a comprehensive improvement plan for a wildlife habitat. **NRS.04.02.02.a.** Classify causes of diseases in wildlife and aquatic species and determine the correct authorities to whom some diseases should be reported. **NRS.04.02.02.b.** Analyze a wildlife or aquatic species disease based on its symptoms, identify if the disease needs to be reported to authorities and determine which authorities it should be reported to. **NRS.04.02.02.c.** Create a management plan to reduce infection and spread of wildlife or aquatic species	

			NRS.04.03. Prevent or manage introduction of ecologically harmful species in a particular region *ELA: RST.11-12.1* *RST.11-12.7* *RST.11-12.8* *WHST.9-10.5* *WHST.11-12.5* *WHST.9-10.7* *WHST.11-12.7* *MATH: MA.HS.N.Q.A* *MA.HS.S.ID.A.* *MA.HS.S.IC.A* *MA.HS.S.IC.B* *SCIENCE: SC.HS.2.6* *SC.HS.2.13*	diseases in natural resource systems. **NRS.04.03.02.a.** Identify and classify invasive species common to a particular region. **NRS.04.03.02.b.** Analyze signs of the spread of invasive species, identify if it needs to be reported to authorities and determine which authorities it should be reported to. **NRS.04.03.03.a.** Research and summarize strategies and benefits of preventing the introduction of harmful species to a particular region. **NRS.04.03.03.b.** Assess and implement a plan for preventing the spread of harmful species for its effectiveness.	

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

CO CTE Academic Standards Resources (Rubrics, integration strategies, etc)

CDE Colorado Academic Standards Online (Online standards lookup tool)

Standard 1: Oral Expression and Listening

Prepared Graduate 1: *Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.*

Students collaborate to assess wildlife and fish populations, evaluate habitat management strategies, develop conservation plans, investigate human impacts on ecosystems, and solve wildlife management challenges through field investigations and project-based learning.

Standard 2: Reading for All Purposes

Prepared Graduate 4: *Read a wide range of informational texts to build knowledge and to better understand the human experience.*

Students analyze wildlife management plans, fisheries management resources, population surveys, habitat assessments, conservation policies, scientific research, and environmental regulations to understand sustainable wildlife and fisheries management practices.

Prepared Graduate 5: *Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.*

Students develop and apply specialized vocabulary related to wildlife ecology, fisheries management, habitat conservation, biodiversity, population dynamics, carrying capacity, invasive species, wildlife diseases, restoration, and ecosystem management to communicate effectively in wildlife and fisheries settings.

Standard 3: Writing and Composition

Prepared Graduate 6: *Craft arguments using techniques specific to the genre.*

Students evaluate wildlife management practices, habitat restoration strategies, fisheries regulations, species conservation efforts, and wildlife policies, defending recommendations using scientific evidence, field observations, and ecological data.

Prepared Graduate 7: *Craft informational/explanatory texts using techniques specific to the genre.*

Students develop wildlife management plans, habitat improvement proposals, fisheries management reports, species assessments, and technical reports explaining ecological principles, conservation practices, and sustainable wildlife management using scientific evidence.

Standard 4: Research Inquiry and Design

Prepared Graduate 10: *Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.*

Students research wildlife populations, fish habitat requirements, species interactions, conservation strategies, wildlife diseases, invasive species, fisheries management practices, and ecosystem health to develop evidence-based management plans that protect and sustain wildlife and aquatic resources.

***Note**: Mathematics and Science standards will be added in the future. Visit the Colorado Academic Standards page for the most current version.*