

Course Title: Wildlife and Fisheries Management

Board Approval Date: September 15, 2020

Credit / Hours: 1.0

Course Description:

This course is designed for students who want to learn about the wildlife, habitat, and fisheries management techniques and technologies used by state/ federal agencies to balance interactions between wildlife, natural resources, and humans. Topics covered include wild game management, habitat protection, and enhancement, and current environmental issues like the impacts of introduced species and the role of fire and top predators in maintaining ecosystem balance. Activities will include field trips to identify and/or collect native plants, birds, fish, and insects.

Learning Activities / Modes of Assessment:

- Bell ringers
- Discussions
- Coloring guides
- Collaboration
- Worksheets
- Video guides
- Labs
- Projects
- Quizzes
- Tests

Instructional Resources:

- PA Hunting and Trapping Digest
- PA Furtaking Student Manual
- PA *Wild* Activity book
- PA *Wet* Activity book
- Various field guides
- Various worksheets and activities
- Power Point, Schoology, iPads, Nearpod,
- Quizlet, Kahoot, etc.
- Youtube videos

Curriculum: High School Science
 Course: Wildlife and Fisheries Management

Know: Understand: Do:

Intro to Wildlife and Fisheries MGMT		
<p>3.1.B.C4</p> <ul style="list-style-type: none"> - Compare and contrast scientific theories. - Know that both direct and indirect observations are used by scientists to study the natural world and universe. - Identify questions and concepts that guide scientific investigations. - Formulate and revise explanations and models using logic and evidence. - Recognize and analyze alternative explanations and models. - Explain the importance of accuracy and precision in making valid measurements. - Examine the status of existing theories. - Evaluate experimental information for relevance and adherence to science processes. - Judge that conclusions are consistent and logical with experimental conditions. - Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. - Communicate and defend a scientific argument. <p>4.1.12.C - Research how</p>	<ul style="list-style-type: none"> - What is Wildlife/Fisheries Management - History of Management and Conservation in the US and PA - Early Conservationists - The role of each player in the management of wildlife and fisheries 	<p>3.1.B.C4</p> <ul style="list-style-type: none"> - Compare and contrast scientific theories. - Know that both direct and indirect observations are used by scientists to study the natural world and universe. - Identify questions and concepts that guide scientific investigations. - Formulate and revise explanations and models using logic and evidence. - Recognize and analyze alternative explanations and models. - Explain the importance of accuracy and precision in making valid measurements. - Examine the status of existing theories. - Evaluate experimental information for relevance and adherence to science processes. - Judge that conclusions are consistent and logical with experimental conditions. - Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. - Communicate and defend a scientific argument. <p>4.1.12.C - Research how</p>

<p>humans affect energy flow within an ecosystem. Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem.</p> <p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems. Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p> <p>4.5.12.A - Research how technology influences the sustainable use of natural resources. - Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p>		<p>humans affect energy flow within an ecosystem. Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem.</p> <p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems. Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p> <p>4.5.12.A - Research how technology influences the sustainable use of natural resources. - Analyze how consumer demands drive the development of technology enabling the sustainable use of natural resources.</p>
Population Dynamics		
<p>3.1.B.C4 - Compare and contrast scientific theories. - Know that both direct and indirect observations are used by scientists to study the natural world and universe. - Identify questions and concepts that guide scientific investigations. - Formulate and revise</p>	<ul style="list-style-type: none"> - Habitat requirements - Refresh and renewal of habitats - Biodiversity of habitats and importance - Population control within ecosystems - Identification, control and eradication of invasives - Predator-prey relationships - Food chains and webs - Top predators and keystone 	<p>3.1.B.C4 - Compare and contrast scientific theories. - Know that both direct and indirect observations are used by scientists to study the natural world and universe. - Identify questions and concepts that guide scientific investigations. - Formulate and revise</p>

<p>explanations and models using logic and evidence.</p> <ul style="list-style-type: none"> - Recognize and analyze alternative explanations and models. - Explain the importance of accuracy and precision in making valid measurements. - Examine the status of existing theories. - Evaluate experimental information for relevance and adherence to science processes. - Judge that conclusions are consistent and logical with experimental conditions. - Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. - Communicate and defend a scientific argument. <p>4.1.12.C - Research how humans affect energy flow within an ecosystem. Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem.</p> <p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems. Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p>	<p>species</p>	<p>explanations and models using logic and evidence.</p> <ul style="list-style-type: none"> - Recognize and analyze alternative explanations and models. - Explain the importance of accuracy and precision in making valid measurements. - Examine the status of existing theories. - Evaluate experimental information for relevance and adherence to science processes. - Judge that conclusions are consistent and logical with experimental conditions. - Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. - Communicate and defend a scientific argument. <p>4.1.12.C - Research how humans affect energy flow within an ecosystem. Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem.</p> <p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems. Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species.</p> <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p>
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<p>4.5.12.B - Evaluate pest management using methods such as cost/benefit analysis, cumulative effects analysis, environmental impact analysis, ethical analysis, and risk analysis.</p> <p>4.5.12.C - Analyze the costs and benefits of means to control pollution.</p> <ul style="list-style-type: none"> - Analyze the role of technology in the reduction of pollution. - Research and analyze the local, state, and national laws that deal with point and non-point source pollution. - Explain mitigation and its role in maintaining environmental health. 		<p>4.5.12.B - Evaluate pest management using methods such as cost/benefit analysis, cumulative effects analysis, environmental impact analysis, ethical analysis, and risk analysis.</p> <p>4.5.12.C - Analyze the costs and benefits of means to control pollution.</p> <ul style="list-style-type: none"> - Analyze the role of technology in the reduction of pollution. - Research and analyze the local, state, and national laws that deal with point and non-point source pollution. - Explain mitigation and its role in maintaining environmental health.
Aquatics		
<p>3.1.B.C4</p> <ul style="list-style-type: none"> - Compare and contrast scientific theories. - Know that both direct and indirect observations are used by scientists to study the natural world and universe. - Identify questions and concepts that guide scientific investigations. - Formulate and revise explanations and models using logic and evidence. - Recognize and analyze alternative explanations and models. - Explain the importance of accuracy and precision in making valid measurements. - Examine the status of 	<ul style="list-style-type: none"> - Conservation, connection, and history - Aquatic habitats - Watersheds and wetlands - Stream health indicators - Sampling methods - Identification of Macroinvertebrate types and stream/river locations - Identification of fish anatomy, types, and aquatic locations - Fisheries management and population control 	<p>3.1.B.C4</p> <ul style="list-style-type: none"> - Compare and contrast scientific theories. - Know that both direct and indirect observations are used by scientists to study the natural world and universe. - Identify questions and concepts that guide scientific investigations. - Formulate and revise explanations and models using logic and evidence. - Recognize and analyze alternative explanations and models. - Explain the importance of accuracy and precision in making valid measurements. - Examine the status of

<p>existing theories.</p> <ul style="list-style-type: none"> - Evaluate experimental information for relevance and adherence to science processes. - Judge that conclusions are consistent and logical with experimental conditions. - Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. - Communicate and defend a scientific argument. <p>4.1.12.C - Research how humans affect energy flow within an ecosystem.</p> <ul style="list-style-type: none"> - Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem. <p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <ul style="list-style-type: none"> - Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species. <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p> <p>4.2.10.A - Examine the interactions between abiotic and biotic factors within a watershed.</p> <ul style="list-style-type: none"> - Describe how topography influences the flow of water in a watershed. - Describe how vegetation affects water runoff. 		<p>existing theories.</p> <ul style="list-style-type: none"> - Evaluate experimental information for relevance and adherence to science processes. - Judge that conclusions are consistent and logical with experimental conditions. - Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution. - Communicate and defend a scientific argument. <p>4.1.12.C - Research how humans affect energy flow within an ecosystem.</p> <ul style="list-style-type: none"> - Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem. <p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <ul style="list-style-type: none"> - Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species. <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p> <p>4.2.10.A - Examine the interactions between abiotic and biotic factors within a watershed.</p> <ul style="list-style-type: none"> - Describe how topography influences the flow of water in a watershed. - Describe how vegetation affects water runoff.
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<p>- Investigate and analyze the effects of land use on the quality of water in a watershed.</p> <p>4.2.10.B - Examine how human interactions impact wetlands and their surrounding environments. - Describe how land use decisions affect wetlands.</p> <p>4.2.10.C - Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. - Explain how limiting factors affect the growth and reproduction of freshwater organisms.</p> <p>4.2.12.A - Examine environmental laws related to land use management and its impact on the water quality and flow within a watershed.</p> <p>4.2.12.B - Analyze the effects of policies and regulations at various governmental levels on wetlands and their surrounding environments. - Examine various public policies relating to wetlands. - Investigate the intended and unintended effects of public policies and regulations relating to wetlands.</p> <p>4.2.12.C - Analyze the effects of policies and regulations at various governmental levels on water quality. - Assess the intended and unintended effects of public policies and regulations relating to water quality.</p>		<p>- Investigate and analyze the effects of land use on the quality of water in a watershed.</p> <p>4.2.10.B - Examine how human interactions impact wetlands and their surrounding environments. - Describe how land use decisions affect wetlands.</p> <p>4.2.10.C - Explain the relationship between water quality and the diversity of life in a freshwater ecosystem. - Explain how limiting factors affect the growth and reproduction of freshwater organisms.</p> <p>4.2.12.A - Examine environmental laws related to land use management and its impact on the water quality and flow within a watershed.</p> <p>4.2.12.B - Analyze the effects of policies and regulations at various governmental levels on wetlands and their surrounding environments. - Examine various public policies relating to wetlands. - Investigate the intended and unintended effects of public policies and regulations relating to wetlands.</p> <p>4.2.12.C - Analyze the effects of policies and regulations at various governmental levels on water quality. - Assess the intended and unintended effects of public policies and regulations relating to water quality.</p>
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US and PA Wildlife

3.1.B.C4

- Compare and contrast scientific theories.
- Know that both direct and indirect observations are used by scientists to study the natural world and universe.
- Identify questions and concepts that guide scientific investigations.
- Formulate and revise explanations and models using logic and evidence.
- Recognize and analyze alternative explanations and models.
- Explain the importance of accuracy and precision in making valid measurements.
- Examine the status of existing theories.
- Evaluate experimental information for relevance and adherence to science processes.
- Judge that conclusions are consistent and logical with experimental conditions.
- Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.
- Communicate and defend a scientific argument.

4.1.12.C - Research how humans affect energy flow within an ecosystem.

- Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem.

- Conservation, connection, and history
- Specific wildlife habitats
- Identification of birds and mammals
- Specific information about certain PA birds and mammals
- Hunting and population control/management of this wildlife

3.1.B.C4

- Compare and contrast scientific theories.
- Know that both direct and indirect observations are used by scientists to study the natural world and universe.
- Identify questions and concepts that guide scientific investigations.
- Formulate and revise explanations and models using logic and evidence.
- Recognize and analyze alternative explanations and models.
- Explain the importance of accuracy and precision in making valid measurements.
- Examine the status of existing theories.
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- Judge that conclusions are consistent and logical with experimental conditions.
- Interpret results of experimental research to predict new information, propose additional investigable questions, or advance a solution.
- Communicate and defend a scientific argument.

4.1.12.C - Research how humans affect energy flow within an ecosystem.

- Describe the impact of industrial, agricultural, and commercial enterprises on an ecosystem.

<p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <ul style="list-style-type: none"> - Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species. <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p> <p>4.3.10.A - Evaluate factors affecting the use of natural resources.</p> <ul style="list-style-type: none"> - Evaluate the effect of consumer demands on the use of natural resources. - Analyze how technologies such as modern mining, harvesting, and transportation equipment affect the use of our natural resources. - Describe how local and state agencies manage natural resources. <p>4.3.10.B - Analyze how humans manage and distribute natural resources.</p> <ul style="list-style-type: none"> - Describe the use of a natural resource with an emphasis on the environmental consequences of extracting, processing, transporting, using, and disposing of it. - Analyze the impact of technology on the management, distribution, and disposal of natural resources. <p>4.3.12.A - Evaluate the advantages and</p>		<p>4.1.12.D - Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.</p> <ul style="list-style-type: none"> - Evaluate the impact of laws and regulations on reducing the number of threatened and endangered species. <p>4.1.12.E - Research solutions addressing human impacts on ecosystems over time.</p> <p>4.3.10.A - Evaluate factors affecting the use of natural resources.</p> <ul style="list-style-type: none"> - Evaluate the effect of consumer demands on the use of natural resources. - Analyze how technologies such as modern mining, harvesting, and transportation equipment affect the use of our natural resources. - Describe how local and state agencies manage natural resources. <p>4.3.10.B - Analyze how humans manage and distribute natural resources.</p> <ul style="list-style-type: none"> - Describe the use of a natural resource with an emphasis on the environmental consequences of extracting, processing, transporting, using, and disposing of it. - Analyze the impact of technology on the management, distribution, and disposal of natural resources. <p>4.3.12.A - Evaluate the advantages and</p>
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<p>disadvantages of using renewable and nonrenewable resources.</p> <ul style="list-style-type: none"> - Explain how consumption rate affects the sustainability of resource use. - Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels. <p>4.3.12.B - Analyze factors that influence the local, regional, national, and global availability of natural resources.</p> <ul style="list-style-type: none"> - Compare the use of natural resources in different countries. - Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism). 		<p>disadvantages of using renewable and nonrenewable resources.</p> <ul style="list-style-type: none"> - Explain how consumption rate affects the sustainability of resource use. - Evaluate the advantages and disadvantages of using renewable resources such as solar power, wind power, and biofuels. <p>4.3.12.B - Analyze factors that influence the local, regional, national, and global availability of natural resources.</p> <ul style="list-style-type: none"> - Compare the use of natural resources in different countries. - Analyze the social, economic, and political factors that affect the distribution of natural resources (e.g., wars, political systems, classism, racism).
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Pacing Guide

Course: Wildlife/Fisheries

**Course Unit (Topic
Periods)**

Length of Instruction (Class

Intro to Wildlife/Fisheries MGMT

10 days

Population Dynamics

30 days

Aquatics

25 days

US and PA Wildlife

25 days