



School District of Horicon Course Outline Learning Targets

Natural Resources Management

UNIT: Sustainability

- Describe the difference between a sustainable choice and an unsustainable choice.
- Summarize each of the three kinds of sustainability and what they entail.
- For a given example, state whether it is ecological, social, or economical sustainability.
- Summarize how the Dust Bowl affected perceptions of sustainability and its importance to modern life.
- Summarize how the forestry industry has changed in regards to sustainability and back claims with examples.
- Summarize the meaning of Aldo Leopold's Land Ethic in their own words.
- Summarize how perceptions of sustainability have changed over time and provide examples to back your claims.
- Anticipate how Americans will view sustainability in the future by predicting how adoption of sustainable practices and attitudes about sustainability will change.

UNIT: Biodiversity and Extinctions

- State the relationship between biodiversity and ecosystem function.
- List the three levels of biodiversity.
- Define and provide examples of the three levels of biodiversity.
- State the relationship between biodiversity and habitat resilience.
- Write and use the formula for biodiversity scores.
- List and provide examples of four kinds of ecosystem function.
- Summarize and utilize the graph showing the relationship between biodiversity and ecosystem function, and state the difference between a Type A and Type B ecosystem.
- State the current rate of extinction by hour and compare this rate to the normal sustainable rate of extinction.
- State the total estimated number of species on the planet and the number that have been identified.
- Compare the current rate of extinction to the past mass extinctions.
- State the percent of fish, mammal, and bird species that have gone extinct already and/or are expected to go extinct in your lifetime.
- State how living species are important to human medicine, food, and the economy.
- List the predicted economic value of ecosystem services.
- List the four main causes of extinction.

UNIT: Habitats

- Explain why habitat loss is the greatest cause of extinction
- Define carrying capacity, community, ecosystem, and niche.
- Provide examples for 6 kinds of niches
- Summarize the meaning and importance of the Competition Exclusion Principle
- Define a species specialist as it pertains to niches
- State the impact that habitat size has on the impact of the Competitive Exclusion Principle
- Describe how invasive species affect the Competitive Exclusion Principle.
- Define resilience, disturbance, and succession as they pertain to habitats.
- Summarize how human disturbances differ from natural disturbances.
- Connect how biodiversity is related to habitat resilience.
- Define habitat fragmentation, patchiness, and edge.
- State the difference between fragmentation, patchiness, and edge.
- Summarize the findings of the Gonzalez experiment of 1998 and how it pertains to habitats.
- List the causes of habitat fragmentation.
- Summarize the outcomes of habitat fragmentation.

UNIT: Invasive Species

- Determine the difference between an introduced species and an invasive species.
- State the rate at which introduced species become invasive
- List the estimated impact on the US economy by invasive species.
- List the eight characteristics of an invasive species.
- Explain what native species are unable to compete with invasive species.
- Identify invasive species that are currently found in Wisconsin
- Use the Invasion Curve graph to determine when it is most feasible to eradicate an invasive species.
- List ways in which human activity can aid the spread of invasive species.
- Predict which of a list of species are most likely to become invasive using what you know to be common characteristics of invasive species.
- State when invasive species can be beneficial.

UNIT: Pollution

- Define and provide examples of the following: pollution, point pollution, non-point pollution, water/air/land/noise/light pollution.
- Summarize the following historical examples of pollution and state how they have changed public perceptions about pollution: Dead Zone in the Gulf of Mexico, Cuyahoga River, The Great Smog of 1952, Silent Spring, Love Canal.
- Summarize the changes created by the following pieces of legislation: Clean Air Act '63, Toxic Substance Control Act, Clean Air Act '70, Pesticides Control Act, Clean Water Act '64, Ocean Dumping Act '72, Safe Drinking Water Act '74, The Comprehensive Environmental Response, Compensation, and Liability Act '80.
- Define "Super Fund" and explain how this program is utilized in regards to pollution.
- Summarize how each of the following impact the environment and/or human populations: Mercury, Lead, DDT, Chromium-6, Carbon Dioxide, Nitrogen, Phosphorus
- Define biomagnification and explain how and why biomagnifiable pollutants cause more problems than other kinds of pollutants.

- Summarize the properties that make a substance biomagnify.
- Define eutrophication and explain how this process impacts aquatic ecosystems.

UNIT: Water Testing

- Define thermal pollution and state how it affects waterways.
- Describe how dissolved oxygen and temp are related.
- Describe how nitrogen and phosphorus affect waterways
- Define Methemoglobinemia – what it is, what it does, and how it is caused
- Summarize how heavy metal pollution harms ecosystems
- List the effects of lead and mercury on living organisms
- Define aquatic macroinvertebrates and state how they are used to determine water quality
- Describe pH and state how it is used to determine water quality
- State how acid rain is caused and how it harms ecosystems

UNIT: Wildlife Management

- State the impact that overharvesting and overhunting have on species extinction rates.
- Summarize how the passenger pigeon went extinct.
- Define wildlife management.
- Provide examples of practices that are a part of wildlife management.
- Define passive habitat management and compare it to active habitat management.
- Summarize why passive habitat management is not an ideal practice for ecosystems.
- Define each of the following: active management; featured species approach; species richness approach; mark-recapture method.
- Summarize how each of the following could be used to estimate a species' population: complete counts; incomplete counts; indirect counts; DNA testing
- Perform the mark-recapture method and estimate a species' population in an area for given information.
- Define carrying capacity and summarize how this concept can be used to manage a species' population.
- Provide examples for each of the three kinds of survivorship curves.
- Compare and contrast logarithmic growth to exponential growth curves for a species' population.
- Compare and contrast K-selection vs. r-selection for a species' population.
- State how a species' management changes if they are density-independent.
- Provide examples of negative feedback in regards to species' population self-regulation
- Define and provide examples of a keystone species.
- Define the following: threatened species; endangered species; CRP; recovery

UNIT: Habitat Management

- Summarize why it is important that Wisconsin landowners take steps to improve the habitat found on their property.
- Summarize the most basic needs of wildlife as provided by its habitat.
- Explain each of the following: Plantings, Feeding, Den Trees, Brush Piles, Nesting Boxes,

Habitat Diversity, Grazing.

- Choose five techniques that would raise the carrying capacity of a given habitat and explain how these techniques would improve this habitat.
- Explain who should be contacted prior to taking action to improve a habitat and why.
- Summarize the pro's and con's of direct feeding of wildlife and take a stance on the issue.
- Explain the importance of understanding a habitat's carrying capacity and summarize the problems associated with exceeding the carrying capacity.

UNIT: Survival

- Students will list and explain the seven basic survival needs.
- Students will summarize health concerns along with avoidance and treatment.
- Students will demonstrate and explain winter survival.

Students will be able to meet the learning targets above as evidenced by formative and summative classroom assessments.