

MIDTERM 2 Review Sheet

This review sheet is a guide to the type of questions I will ask on the exam. The purpose of this review sheet is to point out the most important topics so that you may focus your studying. Be sure to use specific data, accurate information, correct terminology, and concrete examples.

Topics and Information Covered by this Midterm

- Lectures 13-20
- Forest Resources
- Environmental Economics
- Biodiversity Crisis
- Aquatic Diversity
- Wetland Restoration
- Environmental Regulations
- Water Pollution
- Video: *Green Packs and Greenbacks* and *Natural Connections*

Exam includes all readings as given on the Greensheet

Typical Questions on Forest Resources

- How much of the earth's terrestrial surface supports rainforest and what percent of the earth's biodiversity is estimated to be there?
- What are three ecosystem services provided by forests? How does forest loss negatively affect humans?
- How much of the world's forests are in old growth, secondary growth, and plantations? What 5 countries have the greatest amount of the world's forests?
- How much rainforest has been cut worldwide and why is this occurring?
- Some say that the history of the world is a history of forest destruction. Explain what they mean.
- What percent of U.S. forests were logged by the 1890s? What measures did we take to protect forests? How has forest cover changed the situation since 1890?
- What methods are being used to make naturally functioning, uncut rainforests valuable to people?
- What approach has Costa Rica taken to preserving its rainforests?
- What are old growth forests and how much currently remains in the US? Why are old growth forests so important to people and species?
- How do subsidies for the forest industry affect forest preservation in the US?
- What economic, regulatory, and protection measures do we need to take to ensure sustainable forest use?

Typical Questions on the Biodiversity Crisis

- Evidence shows we are experiencing a mass extinction event. When was the last such event and what caused that event?
- How does the current extinction crisis differ from the last major mass extinction event?
- There is no doubt that extinction is a natural process. Define "background rate of extinction". What is the estimate of this rate? How much greater is the current rate of species loss?
- Define "extirpation" and give an example.
- If extinction is natural, why are we worried about the current extinction crisis?
- Why should we care about protecting species? What do they do for us?
- Define "biodiversity". What are the estimates for the number of species on earth? What ecosystems contain most of the world's biodiversity?
- What are the specific causes of species extinction?
- Why are non-native invasive species a threat to terrestrial and aquatic biodiversity? Give an example of the impact of one non-native species on native biodiversity.
- What is the primary law protecting species in the US? What agency has jurisdiction over "listed" species? List three species that have been helped by this law and describe how.

- What are biodiversity hotspots and why is it so important to protect them? What percent of the earth's surface do they cover and what percent of threatened vertebrates would be preserved by protecting those areas?
- It is said that California is an "island". How can that be and why is this important to California's status as a biodiversity hotspot?
- Ecologists say that, "Extinction is forever". Why is this the case?
- What is an endemic species? Name one that occurs in California.
- If new species are evolving naturally, why should we worry that human activities are causing some species to become extinct?
- What is so unique about the western burrowing owl?
- What species does the burrowing owl depend on for its survival in Northern California?
- What has been happening to the California populations of this species and especially in the Bay Area? What can be done to protect the burrowing owl in California?

Typical Questions on Aquatic Diversity and Wetlands Restoration

- What are the major centers of aquatic biodiversity?
- Describe two major services provided by aquatic habitats to humans. How much in economic worth each year do environmental economists say aquatic habitats provide?
- How many known fish species are there and how many species live in coastal waters?
- Give four reasons aquatic biodiversity is threatened.
- What is over-fishing and why is it occurring? What percent of commercially valuable species are affected and what can be done to protect commercially valuable species?
- What is "by-catch", what species are affected, and how much of commercial catches is wasted in this way?
- Describe commercial bottom trawling and its effect on the world's oceans.
- How did the plastic "island" the size of Texas in the Pacific gyre get there?
- What is the Tragedy of the Commons and how does it relate to fisheries?
- Why are protected marine reserves so important?
- Describe what you know about the Monterey Bay Aquarium's Seafood Watch card and its importance.
- What percent of US wetlands have been destroyed? What percent of California's original wetlands are gone?
- What are the causes of wetland loss in the San Francisco Bay Area?
- Name three ecosystem services of wetlands.
- What is ecological restoration and what is the role of this activity in the protection of biodiversity?
- What is the role of restoration in the San Francisco Bay and how much restoration is expected to occur in the future?
- Describe the ecological succession of a tidal salt marsh.

Typical Questions on Environmental Economics and Regulation

- Define subsidy and give two examples of US government subsidies. On average, how much does each citizen pay in subsidies each year?
- What is an externality in environmental economics? How are externalities detrimental when it comes to the way businesses tend to interact with the environment?
- How can government regulations influence the way businesses deal with externalities?
- What is full cost pricing? Why is it important to protecting natural capital?
- From an economic standpoint, what must we do as a society to move our economy toward sustainability?
- What events issued in the US's Second Environmental Revolution and how did the nation respond?

- What does the Endangered Species Act do and which agency is responsible for administering it? Using the spotted owl as an example, explain why it is controversial.
- Has the Clean Air Act been successful? Why or why not? What gas has the EPA recently been required to regulate? Do you think this is a good idea?
- While industry has and continues to balk at environmental regulations, in addition to environmental benefits, regulations have benefited the economy. Explain how.
- Explain how economics and regulation work together in the “cap and trade” system to regulate pollution. Use sulfur dioxide as an example.

Typical Questions on Water Pollution

- Describe eutrophication. Where do the pollutants originate? What are the effects of this process on fish and other aquatic organisms?
- Draw the oxygen sag curve and its effect on organisms.
- The Clean Water Act has been effective at controlling point sources. What are point sources? Describe how the Clean Water Act controls pollutants.
- What other major source of pollutants has the Clean Water Act been less successful at controlling?
- How can wetlands be used in wastewater treatment?
- How does the concept of externality apply to water pollution in the western US?
- According to Miller, what three strategies must be implemented to achieve a more sustainable water future?

Typical Questions on from the Videos

- *Green Pacts and Greenbacks* gives examples of how regulation and economics are working together to protect the environment and create great jobs. Describe one of the jobs you saw illustrated in the video and explain how regulations have resulted in this “green” industry.
- *Natural Connections* provides lots of good information on the current extinction crisis from some of the world’s most famous and well-respected ecologists. The video also presents these ecologists’ ethical views on nature. What are some of those views? Specifically:
 - What is Bob Paine’s view on whether putting a dollar sign on nature can save it?
 - What is Jerry Franklin’s mission in life and why?
 - What does E.O. Wilson say about our responsibility toward creation?