Chapter 11 Notes – Sustaining Aquatic Biodiversity and Ecosystem Services

Core Case Study: The Plight of the Sea Turtles?

--What is the survival rate for baby sea turtles?
--Jellyfish are a staple in sea turtle diets and jellyfish populations have been on the rise. Why are sea turtle populations declining?

11-1 What are the Major Threats to Aquatic Biodiversity?

--What are the three general patterns related to marine biodiversity?
--Where to 90% of marine fish live?
--Describe the largest human caused disturbance to the biosphere.
--What percentage of shallow reefs are threatened, and what are the main contributing factors.
--What are the primary factors contributing to degradation of freshwater systems?
--What is ballast water, and how does it contribute to ecosystem degradation?
--In addition to ocean acidification, and warming water due to climate change, what are other factors that threaten coral reefs?
--What percentage of the human population lives on or near the coast?
--In addition to improving lake clarity, what other factors might result from removing or drastically reducing the population of carp in Lake Wingra Wisconsin?
--How is warming ocean water affecting phytoplankton? Why?
--If we continue to consume seafood at the current rate, how many "earth's oceans" would we need? What is a "fishprint"?
--Describe the various forms of commercial fishing. What is bycatch, and how is it handled?
--What percentage of commercial fisheries are thought to be harvested sustainably?
--Contrast commercial extinction with biological extinction.
--What is fish "ranching" and why is it so detrimental?
--How does overfishing harm humans? Marine mammals? Food webs? Sharks?
--What are some of the negative effects of jellyfish blooms? What effect will climate change likely have on jellies? How can jellies be viewed as an indicator species?
--What roles do sharks play in ecosystems?
--What factors threaten shark populations?
--Rather than being a panacea, why is it likely that shark fins are harmful?
--What measures have been done to protect shark populations?
--Why are sea turtles among the most threatened of all marine species? What are TEDs?

11-2 How can we protect and sustain marine biodiversity?

--Why is protecting marine life so difficult?
--What are ways of protecting marine biodiversity?
--Why are international agreements difficult and often ineffective?
--What are exclusive economic zones? High seas?
--How has the United Nations law of the Sea treaty backfired?
--What is the IUCN, and what is it doing to protect biodiversity?
--What are some of the problems associated with "marine protected areas"?

--What are the benefits of strictly prohibiting human activity from marine reserves? How quickly does this happen? How does the reserve affect neighboring fisheries that are not protected?
--What percentage of the oceans are protected, and what percentage is thought necessary for sustainability?
--Why is prevention better than restoration?
--What are some things that individuals can do to lessen their impact on marine environments?
--what is integrated coastal management?

11-3 How should we manage and sustain marine fisheries?

--What is the first step in managing fisheries?
--What are three ways to estimate fish populations? What are their limitations?
--What are the differences between maximum/optimum/multispecies sustainable yield?
--Describe the catch-share system and its benefits.
--How do government subsidies meant to support fishermen lead to overfishing?
--How does raising herbivorous vs carnivorous fish, through aquaculture, impact marine fisheries?
--List five ways to manage global fisheries more sustainably.

11-4 How should we protect and sustain wetlands?

--What percentage of wetland has the U.S. lost? What are some of the reasons for wetland loss?
--Describe the pros and cons of mitigation banking. How is it often the reverse of the precautionary principle?
--How did the reengineering of the Kissimmee River negatively impact the Florida Everglades? How did it negatively impact the people in south Florida?

11-5 How should we protect and sustain freshwater lakes, rivers and fisheries?

--Review the ecological and economic services provided by freshwater systems.
--How have invasive species affected freshwater ecosytems?
--How are rivers and watersheds connected?
--What ecosystem services do rivers provide? Economic?
--Why was the National Wild and Scenic River Act written and what is its goal?
-- What are some methods for managing freshwater fisheries?

11-6 What should be our priorities for sustaining aquatic biodiversity?

--What are the priorities?
--What principles of sustainability are needed to maintain biodiversity in aquatic habitats? What social science principles can help to achieve these goals?
--What are the three Big Ideas?