BIO 304-4

ECOSYSTEM APPROACH TO RESOURCE MANAGEMENT

COURSE OUTLINE AND OBJECTIVES

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PART D - 2 hrs.

Objectives:

1) To recognize some of the energy and nutrient flows as seen on a field trip to a local stream.

2) To recognize and describe changes in habitat present in a small tributory stream as a result of logging operations.

Description: field trip to Robertson Creek and a small tributory; input of organic matter, uses and losses of energy, destruction of trout spawning areas by logging operations, discussion of changes that should have been made.

Assignment:

1) A two page summary of the observations made on the field trip to Robertson Creek is to be handed in one week after the trip.

PART E - 3 hrs.

Objectives:

1) To describe the effects of logging on the habitat of salmonids in small streams.

2) To recommend the practices to be followed while logging in areas likely to affect salmonid streams.

Description: small coastal streams supporting trout and salmon, clear-cut, and control watersheds, physical and biological conditions prior to logging, stream temperature, dissolved oxygen, and sedimentation levels, changes in fish populations, recommendations, slash removed, leaving of vegetation strips along streams, the effects of the environmental changes on fish survival.

Assignment:

Read "Effects of Logging on the Habitat of Coho Salmon and Cuthroat Trout in Coastal Streams", in "Symposium on Salmon and Trout in Streams", p. 355 - 375.

PART F - 3 hrs.

Objectives:

1) To identify and state how various forest activities affect flows, suspended sediment, temperature and dissolved oxygen of watershed streams.

2) To identify the effect of fertilizing a watershed on the outflow stream.

3) To identify the effects of four timber harvesting methods on water quality.

4) To identify the impacts of recreational activities on the outflow stream.

Description: a computer simulation model to evaluate selected environmental impacts; factors influencing streamflow, level of suspended sediment, stream temperature, dissolved oxygen; impact of fertilization on water quality, timber harvesting methods; impact of recreational activities.

Assignment:

Read "Environmental effects of forest land uses: a multi-resource simulation-based approach" from J. Environ. Sys. 4; 309-340.

UNIT #6 - Contaminants in the Environment and Productivity of Freshwaters

PART A - 2 hrs.

Objectives:

1) To identify the dangers of using insecticides in ecosystems.

2) To state why chlorinated hydrocarbons are a particular threat to ecosystems and the effects on particular organisms.

3) To state the effects and danger of using organophosphate insecticides.

4) To trace the movement of insecticides in ecosystems.

Description: insecticide effect on whole ecosystems, most susceptible organisms, unbalance created, DDT and other insecticides and their effects, danger of chlorinated hydrocarbons - range of biological activity, stability, mobility and affinity for living systems, concentration in the highest levels of the food chain; organophosphates, their effects and dangers in use; effect of insecticides on soils and soil organisms.

Assignment:

Read pages 204 to 212, Ehrlich & Ehrlich.

PART B - 1½ hrs.

Objectives:

1) To state the uses and effects of TFM as a lampricide.

2) To state two kinds of herbicides, their uses, and effects on the ecosystem.

3) To state the problems associated with solid waste as pollutants.

4) To identify and state the sources and dangers of lead, mercury, cadmium, and arsenic as environmental pollutants.

Description: TFM, uses and potential danger to the environment, 2 4 - D etc. as herbicides, mode of action, effects on animals and dangers to ecosystems, triazines and dangers of their usage; solid waste pollutants, heavy metals such as lead, mercury, cadmium and arsenic, sources, effects on animals and humans, occurence in ecosystems.

Assignment:

Read pages 165 to 170, and 222 to 229, Ehrlich and Ehrlich.

PART C - 2 hrs.

Objectives:

1) To state the occurence, sources and importance of nitrogen and phosphates in aquatic ecosystems.

2) To state the natural aging process of lakes and rivers.

3) To state the meaning of eutrophication and identify the most ideal stage for lakes for various recreational activities.

4) To identify the indicators of eutrophication in freshwaters.

Description: nitrogen - natural and artificial sources, release of N into waters, effects and occurence of N in waters; artificial sources of phosphorus and effects on waters; other water pollutants, eutrophication and the natural aging process of lakes, attributes of waters for recreational purposes, signs of eutrophication and characteristics of the waters; measurement of eutrophication.

Assignment:

Read pages 229 to 234, Ehrlich & Ehrlich.