NTNU – Trondheim
Norwegian University of
Science and Technology

Department of Biology

Exam BI 3037 Freshwater ecology

Academic contact during examination: O.K. Berg

Phone: 918 97 518

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Task 1

A. Explain how light extinction in water affects the quantity and quality of light.

B. Explain the role **of internal loading** and how this factor can be modified in the eutrophication process in lakes

Task 2

A. Give the stages of a predation event ("The predation cycle")

B. Explain potential adaptations and strategies fish have to avoid predation

C. What is an ontogenetic niche-shift and among which groups of animals does it normally occur?

Task 3

A. Explain what we mean by cascading trophic interactions in food webs, using an aquatic system with three trophic levels as an example. How would you test for such an interaction? What would you conclude about what controls the abundance of the different trophic levels if you find no evidence for such an interaction?

B. Describe how the ecosystem exploitation hypothesis (Fretwell-Oksanen model) incorporates both top-down and bottom-up processes. Is there any empirical support for this model from aquatic systems?

C. Measurements of the carbon flow in aquatic food webs suggest that the amount of carbon produced by phytoplankton is not sufficient to support observed production at higher trophic levels. What is the explanation for this?

Task 4

Fish somatic growth rates are influenced by both exogenous (i.e. environmental) and endogenous (characteristics of the individuals) factors. Mention as many as possible of these different factors and describe their effects.