



NTNU – Trondheim
Norwegian University of
Science and Technology

Department of biology

Examination paper for BI3063: Biological and genetic stock management

Academic contact during examination: Jarle Mork

Phone: 909 73 351

Examination date: December 5th 2013

Examination time (from-to): 15:00 – 19:00

Permitted examination support material: Calculators Citizen SR-270X, SR-270X College, HP30S

Other information:

Language: English

Number of pages: 2 including this.

Number of pages enclosed: 0

Censorship date: January 6th, 2014

[Will be published on Studentweb. Please direct related questions to the Department]

Checked by:

Date Signature

The questions are weighted differently

Question 1. (Weight 4)

The lectures in the fisheries biology part of the autumn 2013 course were structured in the following points:

1. The most common goal in stock management
2. The practical tools and methods to achieve that goal
3. The biological knowledge about the stocks needed in the work to reach that goal
4. The professional international framework at disposition for stock management

Give a resumé of the contents in each of points 1-4.

Question 2. (Weight 2)

- a) Explain the concepts passive and active net gear. Give examples.
- b) Explain the concepts «selection factor» and “ L_{50} ” for net gear, with a numerical example of their use.

Question 3. (Weight 1)

Explain the concepts

- a) By-catch
- b) Dumping
- c) EEZ

Question 4. (Weight 2)

The genetically effective population size N_e is affected by many factors, such as the sex proportion in the population, variable offspring numbers between families, historical variation in population size, etc.

Consider a population with a generation interval of 1 year which varied in population size over a period of 5 years, with N_e values as in the table below. Use the appropriate formula and calculate the effective size of the population for the whole 5-year period.

	Year 1	Year 2	Year 3	Year 4	Year 5
N_e	500	40	50	300	500

Question 5. (Weight 2)

A random sample of specimens from a population in a diploid species was analysed for individual genotype at a locus with two alleles A and B . The genotypic distribution in the sample was: $AA:14$, $AB:52$, $B;34$.

- a) Calculate allele frequencies.
- b) Calculate observed (H_{obs}) and expected (H_{exp}) heterozygosity.
- c) Carry out a H-W Goodness-of-fit test and report the chi-squared value for observed vs expected genotypic proportions.