Fish 444: Conservation Genetics Spring 2009

Description:

Conservation measures are aimed at protecting the long-term survivability of a species in a changing environment – one that includes human beings. We will examine the role that genetic approaches play in meeting this goal.

The class will start by examining the underlying principles relevant to conservation genetics. We will then move onto the practices: methods of measuring genetic diversity in populations; identification of the units of biodiversity to which conservation efforts are directed; genetics and consequences of population fragmentation; inbreeding and outbreeding; genetic management of wild and captive populations; reintroduction of organisms into the wild; the role of forensics in enforcement and development of recovery plans. We will examine current thought and practices in this constantly evolving field, and will draw from many well-known case studies in the region. Labs will include a laboratory-based molecular genetics study, computer labs, and participation in research work within our research group.

Objectives:

The main aim of this class is to develop your skills as a future scientist by providing a basis for progression in the field of conservation and genetics as a whole.

Specifics goals are:

- Provide the background for interpretation of genetic issues in conservation
- Read and critically evaluate papers from the primary literature
- Design and implement experiments
- Analyze and interpret data
- Write in a clear and concise manner research papers that are suitable for publication
- Contribute to discussions in a rapidly evolving field, both to lay people and to specialists.

Instructor:

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TA:

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Meeting times:

Lectures: M, W, F 10:30 to 11.20, FSH 107
Labs: W 1.30 to 4.20, FTR 113 or FSH 136

Recommended Textbooks (both are on reserve at the UW Fish and Oceans library):

Allendorf FW, Luikart G (2007) Conservation and the Genetics of Populations Blackwell, Malden, MA. 642pp

Frankham R, Ballou JD, Briscoe DA (2002) Introduction to Conservation Genetics. Cambridge University Press, Cambridge. 617pp

Online tools:

We have set up a course website that will be used to disseminate resources for the class. The URL for the website is: http://courses.washington.edu/fish444/. To access materials on the website, you will need your UW NetID and password. Lecture notes in Adobe acrobat format will be uploaded to the syllabus webpage prior to each lecture. We strongly recommend that you watch the "Online Tools page" – we will use this page for news releases, supply you with homework assignments, and provide you with material that is not publicly available.

We will also use online tools in Catalyst WebTools, such as Gradebook (where you can track your grade), WebQ (where you can submit answers to course questions) and CollectIt (where you can submit assignments). Most will be accessible through CommonView. You can access Catalyst here; http://catalyst.washington.edu/web_tools/

Finally, a class email list will be established for dissemination. *Please check your UW email regularly*, because assignment links will be sent to this email address. There will be no excuses for emails not read!

Coursework and Grades

Grades will be based on the following breakdown:

Accumulation of assignments, weeks 1-4: 20%
End of quarter exam: 20%
Literature review for paper: 15%
Research paper: 20%
Labs: 20%
Participation: 5%

We do not mark on a curve – in other words, your marks will reflect your final grade. Exams will be in the "Take-home" format. Submissions are electronic ONLY. If you don't have access to the internet, or find uploading files difficult, please let us know.

Policy on late submissions:

A full 10% will be deducted from a late submission for every day that the work is overdue, starting from the deadline given in class. In other words, if you are given a deadline of 5pm, and you hand in the paper at 6pm, you will lose 10%. This deduction will be wavered under exceptional circumstances. We strongly encourage you to contact us if you are experiencing difficulties prior to the deadline. We are reasonable people….!

Academic Integrity: Unfortunately, we have to put this statement here!

Plagiarism, cheating, and other misconduct are serious violations of your contract as a student. We expect that you will know and follow the University's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to University regulations. More information, including definitions and examples of Academic Misconduct, can be found at: http://depts.washington.edu/grading/issue1/honesty.htm.

A very useful link for student resources regarding academic misconduct: http://depts.washington.edu/grading/issue1/honesty.htm#collaboration.The page gives you useful definitions of plagiarism, and outlines what is and is not acceptable in collaborative projects. Please pay particular attention to this issue, and please note that copying constitutes plagiarism. Our policy in the class is to encourage collaboration over data analysis and processing – however, we would like you to present your interpretation of the data independently, both in the

lab sessions and in the class research project. This interpretation includes your own graphics and tables. Exams and assignments MUST be conducted independently.

Disability Accommodations:

To request academic accommodations due to a disability, please contact Disabled Student Services, 448 Schmitz, (206)543-8924 (V/TTY). If you have a letter from Disabled Student Services indicating that you have a disability that requires academic accommodations, please present the letter to us so we can discuss the accommodations needed for this class.

Syllabus: (subject to change!)

Wk	Day	Date	Lecture topic	Reading	Lab Topic
1	M	30-Mar	Phenotypic diversity	AL2	
	W	1-Apr	FTR 113: DNA Extraction		1: DNA Extraction, FTR 113
	F	3-Apr	*No lecture*		
2	M	6-Apr	Genetic diversity: DNA and proteins	AL3,4	
	W	8-Apr	Evolution: the Hardy-Weinberg principle	AL5	2: PCR, FTR 113
	F	10-Apr	Evolution: natural selection and adaptation	AL8	
3	M	13-Apr	Evolution: mutation and migration	AL12	
	W	15-Apr	Evolution: genetic drift	AL6	3: Genotyping, FTR 113
	F	17-Apr	Evolution: effective population size	AL7	
4	M	20-Apr	Evolution: Multiple Loci	AL10	
	W	22-Apr	Evolution: Quantitative traits	AL11	4: Simulations, FSH 136
	F	24-Apr	Conservation Units: taxonomy & genetic distances	AL16	
5	M	27-Apr	Conservation units: defining Conservation Units	AL16	
	W	29-Apr	Conservation units: practical approaches		5: Phylogenetics, FSH 136
	F	1-May	Research Paper Discussion		
6	M	4-May	Populations: Population subdivision	AL9	
	W	6-May	Populations: metapopulations and fragmentation	AL15	6: Pop^n structure, FSH 136
	F	8-May	Populations: management		
7	M	11-May	Populations: individual based analyses and kinship	AL20	*Research paper review due*
	W	13-May	Hybridization: theory and consequences	AL17	7: Analyze data, FSH 136
	F	15-May	Hybridization: management of hybridization	AL17	
8	M	18-May	Inbreeding	AL13	
	W	20-May	Inbreeding depression	AL13	8: Analyze data, FSH 136
	F	22-May	Conservation genetics in agriculture		
9	M	25-May	*Holiday: Memorial Day*		
	W	27-May	Breeding and restoration: captive populations	AL18	9: Inbreeding & N_e, FSH136
	F	29-May	Breeding and restoration: reintroductions	AL18	*Research Paper due*
10	M	1-Jun	Breeding and restoration: case studies		*Exam distributed*
	W	3-Jun	Viable populations		10: Pop^n Viability Analyses
	F	5-Jun	Forensics		
11	M	8-Jun	*Exam Week*		*Exam due*