

South Dakota State University
College of Agriculture and Biological Sciences
Department of Wildlife and Fisheries Sciences

Spring 2009

Course:	WL 592 – Special Topics Mark-Recapture Analysis (3 credits)
Instructor:	Dr. Robert W. Klaver bklover@usgs.gov (preferred) (605) 594 – 6067 (Office) (605) 334 – 8416 (Home) (605) 212 – 1328 (Cell) Office Hours: By Appointment
Time and Day:	Lecture: Thursdays 6:00-7:50 p.m. Lab: Wednesdays 4:00-4:50 p.m.
Rooms:	Biostress 102 Lecture Biostress 184 Lab
Description:	This course provides an introduction to Mark-Capture-Recapture (MCR) techniques to study animal populations. MCR methods were originally developed to estimate population size. They have been expanded to address survivorship, population growth rate, dispersal and movements, cost of breeding, and recruitment to answer important questions in evolutionary ecology, population dynamics, metapopulation dynamics, and conservation biology and management. This class will focus on the practical applications of MCR analyses using program MARK.
Prerequisites:	Knowledge of wildlife and fisheries ecology, statistics, and Microsoft Windows operating system.
Required Texts:	Couch, E. and G. White. Program Mark: A Gentle Introduction 4 th Edition. The text is free at this site. (http://www.phidot.org/software/mark/docs/book/)
Supplemental Materials:	Handouts or materials provided or recommended by the instructor and provided as supplements to the syllabus. Most supplemental reading material and all datasets for exercises will be available on the library's Electronic Reserves.
Instructional Methods:	Lecture (PowerPoint), Class Exercises, Literature Review, and Discussions.

Course Goals:

Major objectives of this course are to;

- use mark-recapture statistics to estimate mean and variance of survival and other demographic parameters,
- understand the various types of mark-recapture models, their assumptions, required data, analyses, and benefits,
- understand information-theory approaches to model selection,
- implement mark-recapture models in Program MARK, and
- write research in the format of a scientific paper.

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Evaluation of the Student

Attendance:

Attendance is important. Class discussion and interaction is critical for the success of this class. Attendance will not be taken, because I assume all students will attend class meetings, unless emergencies or research precludes it. Obviously, missing class will reduce points assigned for class participation.

Class Participation:

Your questions, knowledge, background, and experiences are critical for the success of this class. Class participation is required and will be included in the total points earned in the class. Assignments must be read and studied before class time. Come to class prepared. Your questions are important. If I do not know the answer, we will find it out together. Particularly in a graduate class, questions are an integral part of learning - with no stupid questions.

Assessment of Student Learning:

Grades will be based on class participation, completing homework exercises, and a research paper during the course.

The values of the assignments are below:

*40 points	Class participation.
60 points	Homework exercises and write-ups.
40 points	Research proposal.
<u>60 points</u>	Research paper.
200 total	

*I recognize that this is a subjective evaluation for 40 points (20% of class points), but I believe that class participation is essential. I will provide 75% of these points for what I consider to be a normal contribution. I will provide more or fewer points for those who participate more or less.

Final Grade Calculation:

90% and above A

80 – 89%	B
70 – 79%	C
60 – 69%	D
59% and below	F

This scale may be adjusted downward, but will not be adjusted upward.

Research Proposal and Paper:

Prepare an 6 to 10 page paper on a case study relating to course material. Develop the rationale for the need of the project in your case study. Provide background information, methods to solve the problem, a priori hypotheses, and expected results. Document your paper with appropriate literature citations using the Journal of Wildlife Management / Transactions of the American Fisheries Society style. Use the material in the text, the suggested readings, and current literature. The paper will be evaluated based on coverage of the topic, content, writing style, syntax, and use of the literature.

Due: Research Paper due April 30. For each of these there will be a 1-point per day deduction for late assignments.

Tentative Course Schedule:

Jan 15:	Introduction. Overview of Mark-Recapture Analyses
Jan 22:	Binomial and multinomial distributions and maximum likelihood theory Data formatting for Program MARK
Jan 29:	Cormack-Jolly-Seber models Program MARK Comparing groups
Feb 5:	Goodness of Fit
Feb 12:	Comparing models
Feb 19:	Linear models
Feb 26:	Linear models continued
March 5:	Age and cohort models
March 12:	<i>No Class – Spring Break</i>
March 19:	Final selection of topics will be selected from Gentle Introduction to MARK based on the needs and interest of the students in the class including Nest Success and Known Fate models, and Individual Covariates.

March 26:

April 2:

April 9: *Perhaps no class – Easter Break*

April 16:

April 23:

April 30: **Research Paper Due**

Students with Disabilities:

Students with disabilities should alert the professor and the university that they have a disability so that necessary adaptation can be provided. Students are entitled to “reasonable accommodations” under provisions of the American with Disabilities Act. Those in need of such accommodation should notify the instructor and make appropriate arrangements with the SDSU Office of Disability Services, SAD 102 (688-4504 or 688-4032).

Academic Honesty:

The Department and the University have taken a strong and clear stand regarding academic dishonesty. We believe that it is unethical and unprofessional to present work done by others in a manner indicating that the student/s is/are presenting material as his/her original ideas or work; such activity is academic dishonesty. Plagiarizing or knowingly assisting others in plagiarizing on tests, quizzes, problems, assignments, research papers, theses, dissertations, or other academic activities is unacceptable behavior. All academic work completed by students is expected to be the original work of that individual student, unless permission is specifically granted beforehand by the faculty member for some form of team effort or other format. If students are unsure if a particular activity may be regarded as a form of academic dishonesty they should consult the faculty member before undertaking such an activity.

The University has a policy on academic honesty, procedures for academic grade and dishonesty appeals, and sanctions for such activities (see Student Code). The Student Code has different procedures for undergraduate and graduate students.

The Department policy described in this handout is intended to attempt to address perceived academic dishonesty violations between the faculty member/s and student/s before Student Code procedures are implemented. This is done because under Student Code procedures the minimum penalty for academic dishonesty is Disciplinary Probation. These added Department steps (Steps 1, 2, and 3 of the Undergraduate Student and Graduate Student Procedures) should not be construed as an attempt to circumvent the Student Code system; both students and/or the faculty member have the option to go directly into that system. The Department procedures portion of

this policy are only available to a student one time; any second perceived offense will immediately follow the Student Code procedures.

1. When a student/s is/are determined to have broken the Academic Dishonesty Policy, he/she will be notified verbally by the faculty member involved as to the problem and sanction selected. This is similar to procedures 02:02:01:03 and 02:02:01:04 in the Student Code. The faculty member will do this immediately after the perceived violation occurs. Sanction options available to the faculty member are as follows:
 - a. provide the student/s a grade of zero or some other score on the test, quiz, problem, assignment, or other academic endeavor involved;
 - b. provide the student/s a grade of “F” in the course;
 - c. request that the student/s withdraw from the course;
 - d. request that the student/s change the grading for the course to an “audit”; or
 - e. immediately refer the case to the Student Code procedures.

The sanction selected is at the discretion of the faculty member, based on the seriousness of the situation.

2. If the student/s agrees to the sanction proposed by the faculty member the process is completed.
3. If the student/s does not agree to the sanction proposed by the faculty member, he/she has the right to appeal the faculty member’s decision. This Informal Phase Appeal should be made directly (both verbally and in writing) to the faculty member involved within 5 class days of notification or within 7 calendar days of notification, if the incident is at the end of the semester. The faculty member may then modify or leave unchanged the sanction proposed in step 1. A copy of the student’s written appeal and the faculty member’s written response will be sent to the Department Head so that a confidential record to protect the student/s and the faculty member is established. The student/s written appeal and faculty member written response will be secured in the student’s file until graduation or he/she leaves the program; if no further perceived violations have occurred these materials will be purged from the student’s file.
4. If the student/s is/are still dissatisfied with the decision he/she can appeal to the Department Head. This Informal Phase Appeal should be made verbally. The Department Head will utilize this verbal appeal and the written student appeal and faculty written response described in step 3 to reach a decision. (These are steps 02:02:01:05,

02:02:01:06, and 02:02:01:07 in the Informal Phase Appeal process described in the Student Code).

5. If the student/s and faculty member agree with the Department Head's decision, the process is completed. Up to this point, no one other than the student/s, faculty member, and Department Head has been made aware of the situation.
6. If the student/s or faculty member is/are dissatisfied with the Department Head's decision they can enter the Formal Phase of the Student Code process (Student Code 02:02:02). It is the responsibility of the faculty member and student/s to be aware of the procedures and penalties involved.