

ST 506 Homework Set 6

Due Tuesday Sept 30, 2008

This homework focuses on use of software to find estimates of population size for closed capture-recapture and removal sampling examples.

1. Consider the following small humpback whale photo-id capture-recapture data set kindly supplied by Dr Lyndon Brooks. In this case the 3 occasions are different places on the Australian where whales were observed close together in one migration season close together so that the assumption of closure may be a reasonable approximation. (We will provide more biological details after you have completed the homework when we discuss the analysis further). This is the structure of the “inp” file in summary format.

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100 319;  
010 297;  
001 179;  
110 14;  
101 10;  
011 10;  
111 0;
```

- (a) I want you to do analyses using MARK directly to find MLES for models M_t , M_0 and M_b .
 - (b) I want you to use CAPTURE from MARK to find the Chao and Jackknife estimates under Model M_h .
2. Consider the following European Hare removal data set (Skalski et al. 2005 “Wildlife Demography” p. 493). There were 4 periods with 722, 191, 69, and 36 removals. Please find the standard removal estimate of population size and its standard error (M_b) and the population estimate that allows for heterogeneity of removal rates (M_{bh}).