**Preliminary Exam Questions: Dr. Dinsmore**

Marty Simonson

March 27, 2020

3. Below is a 2x2 contingency table showing the observed breeding status (B=breeding, NB = non-breeding) for a hypothetical fish in a given year. Furthermore, there are two classes of fish in each breeding category: fish attempting to breed for the first time (First), and experienced breeders (Exp).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B | NB | Total | % B |
| First | 110 | 45 | 155 | 71% |
| Exp | 92 | 63 | 155 | 59% |
| Total | 202 | 108 | 310 | 65% |

1. Create a partition of the above table into two possible 2x2 tables (which must sum to the numbers in the above table) that constitute a good example of Simpson’s Paradox. (note: there is no unique solution to this).
2. State Simpson’s Paradox in its general form. Why does it raise concern regarding the analysis of observational ecological data, even under a model-based data analysis?
3. Why are we nearly immune to Simpson’s Paradox when using a well-designed and highly replicated experiment?