Alameda County Avian Fatality Monitoring Project
Detection Probability Simulation Conference Call
March 8, 2011

Participants

Doug Leslie, Jesse Schwartz, Julie Yee, Brian Karas

Purpose

Build on Julie's and Brian's simulation of a cumulative detection method presented at the Feb 2011 SRC meeting in order to simulate Jesse's current QAQC method. These simulations will be designed to evaluate the M team's detection probability programs in their effectiveness to improve fatality estimation and trend analysis (50% reduction).

Meeting Notes (topics)

1. The following factors were identified as issues to consider when developing the simulations:

   a. Effect of different sources of variation in singular detection probabilities (i.e., searcher efficiency and scavenger removal probabilities, P199).

   b. Conjunction Fallacy, i.e. the idea that the independently estimated searcher efficiency and carcass removal probabilities can be combined to produce a valid detection probability.

   c. Sample size (few fatalities are found due to relatively rare event of fatality occurring in the QAQC)

   d. Effect of varying search intervals on detection probability.

   e. The use of Fatalities per Search for a detection function, as seen in Jesse's presentation during the Feb 2011 SRC meeting, vs. developing continuous cumulative detection probability functions with carcass age dependence, such as those derived in Smallwood (2007) or variations thereof. Jesse's approach avoids the use of continuously defined detection probability functions and focuses on modeling the patterns of aggregated numbers of fatalities per search in relation to covariates.

2. Opinions

   a. Jesse: Significant variability coupled with a small sample size make detection probability programs difficult and simulations should incorporate variation at the level of the individual and reflect the scale of actual QAQC surveys. Also Jesse is skeptical about parameterizing a

continuous detection probability function because it would be sensitive to small scale variations such as 1 vs. 2 fatalities, or surveys on Monday vs. Wednesday.

b. Julie: Variability in singular detection probabilities can be built into the simulations. Julie doesn't understand how the conjunction fallacy applies to this system nor how the variability in detection probability will necessarily dissolve the ability to generate useful parameterized continuous detection probability functions. And if Jesse is correct about sensitivities to small scale variations, then what is the value of continuing these surveys regardless of the method of analysis? Jesse's response to this question was that the Fatalities per Search contain detection patterns that can be clearly explained, when aggregated across bird groups and modeled in relationship to environmental and observer covariates that influence searcher efficiency, as he demonstrated during his February 2011 presentation for the in-person meeting.

c. Brian: Hopes that simulations can explore whether there is an issue of bias occurring in detection functions when leveraged from naturally found carcasses. Brian is optimistic that with proper methodology levels of variability in system can be overcome with sampling strategies ("That which you cannot control for, RANDOMIZE!" a T-shirt idea) Brian thinks starting with simple idealized method simulations is best before adding levels of variability and complexity.

d. Doug: Is optimistic that the QAQC program will have very interesting outcomes that help us understand issues around detection probability (and we all agree).

3. Outcomes

a. Julie and Brian agreed to incorporate the following specifics into their simulation exercise:

i. Vary search rotations between 30 and 40 days

ii. X Primary turbine searches per rotation. Currently X is ~1200, but allow for changes in scale.

iii. To incorporate variation among BLOBS.

iv. Secondary searches at 33%of X. [1]

v. Pre- and Post-searches at 20% of X but at Secondary Search turbines only. [2]

vi. Pre- and Post-searches will not count as detection outcomes but will be treated as empirical confirmations of fatality status. Post-searches will be simulated with an increased searcher efficiency, because the supervisor conducting post-searches is not

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[1] value subsequently determined to be 25%.

[2] value subsequently determined to be 15%.

blind to earlier carcass detections, and a slight chance of removal because the searches are done one or two days from secondary searches allowing for some chance of removal.

vii. Temporal and spatial (between-turbine) variation in the numbers of fatality deposition, in singular detection probabilities, and in search rotation.

a) The search schedule of Primary, Secondary, and pre-post searches will be provided on 5/27/11. Jesse will also provide the detection outcomes.

b) Jesse agreed to provide background publications which describe the issues that he raised during the call about double sampling and detection when relatively small numbers of detections are involved.