

QA/QC: A Detection Probability Exercise

Terminology:

Singular Detection Probabilities

Scavenger Removal function: proportion of carcasses that remain, as a function of carcass age.

Searcher Efficiency function: proportion of carcasses detected, as a function of carcass age.

Combined Detection Probability Function:

Proportion of carcasses that remain (Scavenger Removal) and are detected (searcher efficiency), as a function of carcass age.

Cumulative Detection Probability Function:

Proportion of carcasses that remain and are detected (combined detection probability) over multiple searches with an interval of (X). Note: this includes any possible change in combined detection probability due to carcasses “surviving “detection and removal in an interval but is detected on subsequent searches.

Example:

20 fatalities are deposited and searched for up to 90 days (three 30-day intervals).

30-day interval	Scavenger removal	Searcher efficiency	Combined detection probability	Detections	Cumulative detections
1	0.9	0.55	0.5	10	10
2	0.8	0.5	0.4	4	14
3	0.667	0.5	0.333	2	16

CDP Simulation Exercise:

Goal: Simulate the cumulative detection probability of finding carcasses that are less than 90 days old at turbine searches with 30 day intervals.

Description of what's being simulated:

First we split the strings surveyed into two even effort groups (Area 1 and 2) and we also split the crew into two independent teams (Teams A and B). Strings in area 1 and 2 are searched in a standard order minimizing drive time over 30 days. Fresh (non-scavenged) carcasses are placed strategically by the crew leader at strings ahead of the standard order in area 1 and 2, so that detection events are spaced out throughout the 30 day interval, in other words some carcasses are placed at strings that will be searched immediately others are placed at strings that will be searched at the end of the interval (and everything in between). In practice this would be fairly easy, on day 0 all trial carcasses would be placed but spread over the standard search order described. In the first interval of 30 days (Interval 1 days 1-30) Team A would search Area 1 and Team B Area 2. All trial birds are left in the field. By tracking the proportion of trial carcasses found in interval one by blind searches we would get the Cumulative Detection Probability function (curve) for carcasses that are 0-30 days old frame. In addition the Crew Leader will perform status checks for presence of trial carcasses at strings the day that searches take place. This will provide data for standard searcher efficiency and scavenger removal rates for comparisons in method. In the next 30 day interval (interval 2 days 31-60) teams A and B switch areas, Team A searches Area 2 and Team B searches Area 1 in the standard order. Since the trial birds have been deployed strategically we now get another series of blind searches that generate the CDP function for carcasses 31-60 days old frame. The Crew Leader would continue with proscribed status checks. At this point all of the trial carcasses already detected by Team A in Area 1 and detected by Team B in Area 2 can be removed because in Interval 3 we are concerned with those that were missed in Interval 1 and still persist in Interval 3 (expected to be a small proportion of the initial deployment). Now in the next 30 day interval (Interval 3 days 61-90) Team A will search Area 1 and Team B will search Area 1 still in the standard order. We now have the final series of blind searches on trial carcasses and generate the final frame of the CDP function for carcasses 61-90 days old. The Crew Leader will perform the final set of status checks.