

Second Review of American Kestrel-Burrowing owl (KB) Scavenger Removal Adjustments Reported in Alameda County Avian Monitoring Team's M21 for the Altamont Pass Wind Resource Area

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During an Alameda County Scientific Review Committee (SRC) conference call on 21 June 2010, certain statements were made that I felt required some follow-up data analysis. A monitoring team member said that estimates of the removal curves from the KB study were highly sensitive to changes in the determination of how many days elapsed before carcasses were removed. He explained that changing the number of days to removal of only a few fatalities can drastically change the shape of the curve. Sensitivity analysis was said to have been performed, but the SRC was not shown the results of that analysis. However, the monitoring team walked the SRC through sets of data sheets and photos for at least two fatalities that were subject to dispute over the determination of the number of days to removal. These examples were also used to demonstrate the ambiguities in the reporting of carcass condition throughout the KB monitoring effort.

One example the monitoring team showed the SRC was fatality number KB20070906-02. During the conference call, I argued the fatality should have been determined as removed by early October 2007, but I conceded that sufficient remains were found again at the end of the trial to be considered a fatality. It turns out that the monitoring team concluded the carcass remained through 54 days of the trial, whereas I had given it a range of 36 to 56 days due to the ambiguity of the reporting (my upper end estimate of 56 days accounted for the 2 days preceding the fatality find). I took the midpoint of the range, so I assigned the days to removal as 46. In other words, considering the long time since discovery before a dispute arose, there was little difference between the time to removal I used and the time the monitoring team used.

Another example was fatality number KB20070906-01. The monitoring team determined the remains were detectable as a fatality for 54 days to the end of the trial. I gave it a range of 26 to 56 days, and a midpoint of 41 days. Again, considering the long time since discovery, there was little difference between my determination and the monitoring team's determination of when this carcass was removed. Disputes over determinations of removal time would be more significant when closer to the trial's start date.

After the call, I reviewed the monitoring team's data and my interpretation of the data. We had agreed on time to removal for more than half the fatality records, and we were within 4 days of each other for another 25% of the records. In this follow-up analysis, I examine the degree to which our differences in determinations of time to removal affected the removal curves. This analysis will appear slightly different than earlier analyses because I omitted 9 fatality records of small birds, most due to evidence indicating they were old remains at the time of discovery (Table 1).

Table 1. Small bird fatality finds that I omitted from estimation of removal curves.

Fatality	Reason for omission from analysis
KB20070923-01	Appeared old and was partly buried
KB20070923-03	Appeared a bit older and already scavenged by vertebrate
KB20080308-01	Trial terminated because team decided feathers were outside search area
KB20080310-02	Remains already somewhat old -- one of first searches of trial
KB20080425-03	Old feather pile
KB20070904-01	Found as feather pile on first search, no follow-up until 12 days later
KB20070918-02	Part buried in dirt when found; carcass condition appeared old
KB20071020-02	"Very weathered" wing
KB20080303-02	Feather pile found in one of first searches

METHODS

I used the same basic approach as presented in SRC document P154. I used the cumulative carcasses remaining curve from the Vasco Caves scavenger removal trial to project the number of small bird carcasses that were likely removed during the two day period between carcass discovery and the previous fatality search during the KB study.

RESULTS

The proportion of carcasses remaining related to the number of days since the beginning of the trial with and without adjusting the data for the two days preceding initial discoveries of the carcasses (Tables 2 and 3). The resulting models were used to calculate the cumulative carcasses remaining through the trial and projected beyond the trial periods.

Table 2. Least-square regression models of Smallwood's version of the proportion of carcasses remaining regressed on days since placement (Vasco Caves study) or since the last fatality search (KB study), where, a and b were fitted coefficients.

Group	Model	r²	n	P-value	a	b
All small birds	Logarithmic	0.97	23	<0.001	1.3468	-0.2581
All small birds, adjusted for 2 days preceding discovery date	Logarithmic	0.98	35 (projected)	<0.001	0.9366	-0.1910

Table 3. Least-square regression models of the monitoring team's version of the proportion of carcasses remaining regressed on days since placement (Vasco Caves study) or since the last fatality search (KB study), where, a and b were fitted coefficients.

Group	Model	r²	n	P-value	a	b
All small birds	Logarithmic	0.92	23	<0.001	1.2710	-0.1944
All small birds, adjusted for 2 days preceding discovery date	Logarithmic	0.96	35 (projected)	<0.001	0.9129	-0.1594

Removal curves appeared to differ between using the monitoring team's and my determinations of days to carcass removal, but they were more similar after adjusting the rates for the two days preceding the carcass discovery date (Figure 1). After using the removal curves to calculate cumulative removal curves, the latter curves were more similar to each other than either of them was to the curve reported in M21 or to the curve produced from data collected at Vasco Caves (Figure 2).

DISCUSSION

I realize the SRC has decided to drop consideration of using the KB study to adjust fatality rate estimates, but I decided to perform this follow-up analysis because a lot of time and money was directed to the KB study. It would be a shame to miss an opportunity to use the results of the study so long as the results are defensible. The removal curves are sensitive to differences in determinations of days to removal, but perhaps not as sensitive as the SRC came to believe on the conference call. The ambiguities of the reporting on the data sheets were less influential on the removal curves than was omitting the removals over the first two days of each trial. Furthermore, I remained unable to reproduce the curve presented in M21, even after using the monitoring team's determinations of days to carcass removal and after omitting the removals that likely occurred over the first two days preceding carcass discovery. I still cannot understand how the removal curve in M21 was generated.

My recommendation would be to consider taking a mean value between the Smallwood (2007) removal rates, the Vasco Caves (Smallwood et al. 2010) removal rates, and my estimated removal rates using the monitoring team's determinations of days to removal in the KB study (thin black line in Figure 2). Regardless of whether my recommendation is followed, I commend the monitoring team for pushing hard on this removal curve and for exposing major weaknesses in scavenger removal trials in general.

REFERENCES

- ICF Jones & Stokes. 2009. Altamont Pass Wind Resource Area Bird Fatality Study. Revised Draft of Report M21 to Alameda County Community Development Agency, Hayward, California.
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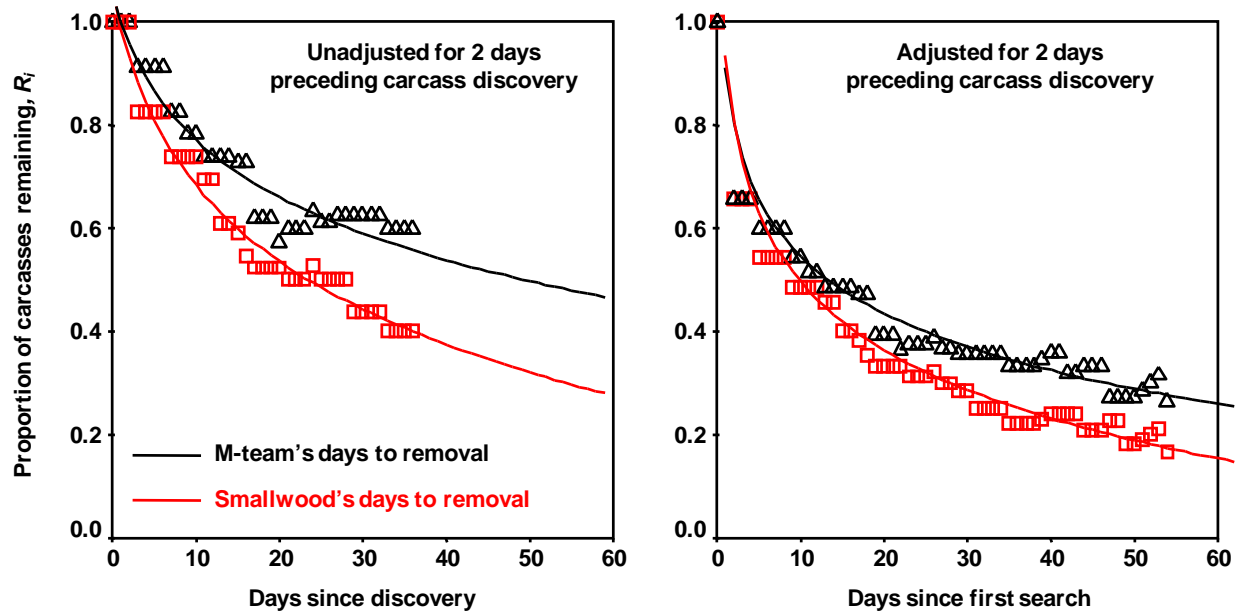


Figure 1. The effects on removal curves due to differences between the monitoring team's and my determinations of the time to removal of small bird carcasses in the KB study. The curves on the left treat the discovery date as the trial initiation, whereas the curves on the right treat the discovery date as two days of trial since the last search was performed.

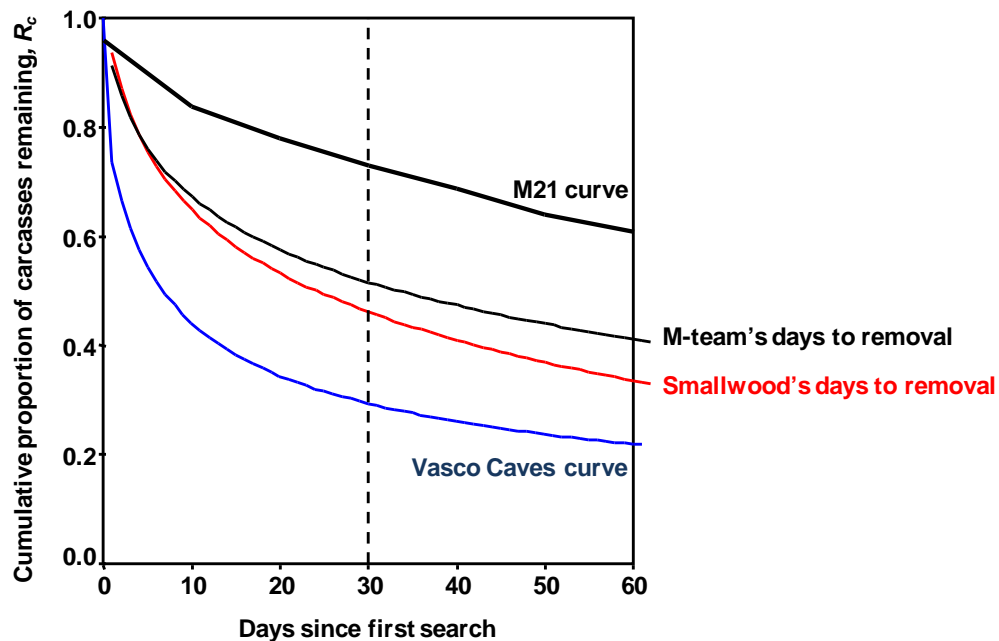


Figure 2. Differences in cumulative removal curves between what was reported in M21, at Vasco Caves, and in this analysis. The difference in removal curves due to different determinations of days to removal was much smaller than the differences between these curves and either the one reported in M21 or for Vasco Caves.