Notes on LMB abundance estimates

MAH, 10/5/2022

9/28/2022

I am trying to derive estimates of the LMB population at Antioch Dunes using Travis Longcore’s data and population estimates and the approach Angela Galerreta, Steve and I developed approach, which I think may be a better approach. The most recent 5-yr review for LMB has a discussion of the abundance estimate approach. We assumed residence time would be 8.85 days on average and a detection probability of 0.5. We describe how we decided to use the detection probability of 0.5 in the 5-yr review, but do not describe the residence time estimate of 8.85. Look into this. Was this from some of the early work at ADNWR?

Page 24 of the 5-yr review PDF shows results of the captive propagation program (Table 1), which I have recreated in a spreadsheet.

10/5/2022

I settled on using 6.0 for r. Susan field observations and Jana Johnson’s CP data suggest that r may be lower than the Arnold and Powell estimate described below.

r is average residence time for males and females. This value is not currently known, but we have what appear to be reasonably good estimates from Arnold and Powell (1983), which suggests that average residence times for males and females during their study were in the range of 8.85 days. See my handwritten notes and calculations on Arnold and Powell (1983, page 118). For the 2020 LMB 5-yr review Angela and I decided to use 8.85 for r. I suspect this value may be a little high for what residence time is now for LMB, in part because the population is so small predation experienced by individuals in the population may be higher. Susan thinks residence time is lower, and I believe Jana Johnson's captive propagation results suggests lower r in captivity. For this analysis, I will use r = 6.0

Also, there appears to be discrepancies between Travis Longcore’s spreadsheet that he provided to Cheryl Schultz and the data that Angela used in the calculations for the last 5-yr review (Service 2020). The data Angela used was compiled and vetted by her and Ann Mankowski. I have considerable confidence in their data, so will use their data unless and until I can track down the discrepancy.

I sent the following Teams chat to Anne:

*Hi Anne, I hope things are going well in Reno. I'd love to hear how things are going sometime. I'm looking at some of the Lange's metalmark data and see some discrepancies between raw LMB counts on Pollard walks recorded by our office and by Travis Longcore for the earlier years (1986-2007). I am under the impression that you helped vet and QC the LMB pollard walk data. If that is the case it gives me great confidence in our numbers. Is that the case, that you helped review the LMB data? If not, I'll look into it more. Thanks much and very sorry to bug you!*