

Name:
Section:
Assignment Due:

<i>Honor Pledge</i> "I have neither given nor received unauthorized aid on this activity. All work submitted here is my own, or the result of authorized in-class collaboration." <i>Signed:</i> _____
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Mark-recapture & beetle population growth assignment

Format: 20pts

<u>Font:</u> Times New Roman; Size 12; <u>Paragraph:</u> 1.15 spacing; 1" margins; <u>Correct Grammar and Spelling;</u> <u>Honor Code Signed;</u> <u>Pages:</u> 2 one-sided or 1 double-sided	<u>Layout:</u> Organize your answers as indicated below <u>Literature Citation:</u> in-text and complete at end of assignment <u>Reference example:</u> Author's Last Name, First Initial. Year. Title. Journal. Vol#(Pages).
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Questions: 80pts

Part I – Population size estimation

- 1) Use the data from all of the sections (provided on Moodle) to A) make a bargraph comparing the estimated population size and the true population size for each treatment (flour + yeast, cracked wheat + yeast, cracked wheat – yeast), including error bars, and B) run paired t-tests (using Excel) comparing the estimated population sizes and the true population sizes for each treatment. Include a summary of your t-test results in a well written figure caption, not exceeding 4 sentences. Be sure to explain: 1 – what the data used to construct the figure represent, 2 – the question that you were attempting to answer, 4 – what statistical test was used, and 3 – the results. (20 points)

If you need a refresher on running a paired t-test, this link is useful:

https://youtu.be/BIS11D2VL_U

Don't forget: You need to run *separate test for each treatment*

- 2) In your own words, what is the difference between precision and accuracy? (5 points)
- 3) List the assumptions for the Lincoln-Petersen mark-recapture method (recall, these are described in your lab intro/procedure), and, in one sentence each, explain how each of these assumptions might be violated and explain how that would impact the resulting estimate. (10 points)

Part II – Flour beetle population dynamics

- 4) A) Which (if any) treatments transitioned to logistic growth? B) How do you know (hint: look at population growth rate data). C) Which treatment experienced the fastest rate of growth during the exponential phase? D) Did the treatments enter logistic growth at different times? Which treatment (if any) entered the logistic growth phase first, and

which (if any) entered last? D) To the best of your ability, estimate the carrying capacity (K) for each treatment (a visual estimate is fine, do not do any calculations). (20 points)

- 5) Offer a well thought out, non-trivial, hypothesis or set of hypotheses to explain any differences between treatments described in 5 above. Note: “The population dynamics differed because the resources differed”, or similar, is not a sufficient answer. (25 points)