Fish Mark and Recapture Simulation

**Trial 1.** Have the trapper close his or her eyes and scoop a sample from the bowl. Have the marker write the letter M on all goldfish in the sample. Have the data recorder record the number of goldfish (M) and the number of bycatch caught. Return the fish back to the bowl and mix thoroughly.

**Trial 2.** Have the trapper collect a second, larger sample of fish. Have the marker write the letter C on all goldfish in the sample, and the letter R on the goldfish that were recaptured. Have the data recorder record the number of fish that were captured (C), the number of fish that were recaptured (R), and any bycatch. After you have completed both trials, write your calculations to estimate the size of the population.

**Team Members**

Marker: ____________________________________________

Trapper: ____________________________________________

Data Recorder: ______________________________________

<table>
<thead>
<tr>
<th>Data</th>
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<tbody>
<tr>
<td>Original Estimation</td>
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<tr>
<td>How many fish do you think are in the population?</td>
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### Fish Mark and Recapture Simulation, continued

<table>
<thead>
<tr>
<th>Find</th>
<th>Formula</th>
<th>Result</th>
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</thead>
</table>
| Estimated Size of Target Species Population | formula: \[
\frac{\text{# Target Fish caught in Trial 1 (marked M)} \times \text{# Target Fish caught in Trial 2 (marked C)}}{\text{Total # Recaptured Fish (marked R)}}
\] |                                                                            |
|                                           | calculation: \[
\frac{\text{# Target Fish caught in Trial 1 (marked M)} \times \text{# Target Fish caught in Trial 2 (marked C)}}{\text{Total # Recaptured Fish (marked R)}}
\] |                                                                            |
| Percentage of Total Bycatch               | formula: \[
\frac{\text{Bycatch total 1} + \text{Bycatch total 2}}{\text{M + C + Bycatch total 1} + \text{Bycatch total 2}} = \frac{\text{Bycatch total}}{\text{Total number of organisms caught}} = \text{Bycatch ratio}
\] | Bycatch Ratio = \[
\frac{\text{Bycatch total}}{\text{Total number of organisms caught}} \times 100
\] |
|                                           | calculation: \[
\frac{\text{Bycatch total 1} + \text{Bycatch total 2}}{\text{M + C + Bycatch total 1} + \text{Bycatch total 2}} = \frac{\text{Bycatch total}}{\text{Total number of organisms caught}} = \text{Bycatch ratio}
\] |                                                                            |
| Actual # of Target Species                | Count and record the actual number of Target Species in your sample. |                                                                            |