**BIOL 5504:** **Quantitative Methods in Ecology and Evolution**

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**Results**

The likelihood ratio tests for model comparison shows the simple model including only boat length is the one which has the lower difference in numbers of parameters (Table 1). Based on the likelihood ratio test, length model is my best model that explained the relationship between catch and boat length from river sites.

Therefore, for the information criteria using AIC selection model indicated a different best fit. There was only one best approximating model for fish catch (Table 1), which indicated that boat length had a significant effect on the catch depending on the river site.

**Table 1. Likelihood ratio test values to compare all nested model based on the relation between fish catch and boat length for each river site.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Models | theta | Resid | Log-lik | df | Likelihood ratio | P -value |
| Catch ~ 1 | 3131908 | 799049 | -2739757535 |  |  |  |
| Catch ~ length | 4462229 | 799048 | -2639892385 | 1 | 99865150 | 0 |
| Catch ~ length + river | 4454696 | 799045 | -2629931724 | 3 | 9960661 | 0 |
| Catch ~ length \* river | 4456644 | 799042 | -2629404266 | 3 | 527458 | 0 |

**Table 2.** Best approximating models for each river site and boat length based on AICc values, AICc differences from best model (Δ) and Akaike’s weights (w). K is number of parameters estimated for each model, including intercept and error terms.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Models | AICc | Δ | w | K |
| Catch ~ length \* river | 2629404284 | 0 | 1 | 8 |
| Catch ~ length + river | 2629931736 | 527452 | 0 | 5 |
| Catch ~ length | 2639892391 | 10488107 | 0 | 2 |
| Catch ~ river | 2722625759 | 93221475 | 0 | 4 |
|  |  |  |  |  |