**Article title:** Prey availability and intraguild competition regulate the spatiotemporal dynamics of a modified large carnivore guild

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**Supplementary Material A: Overall summaries of co-detection models used for estimating parameter effect on leopard and spotted hyaena detection**

**Table S1.** Overall summaries of binomial generalised linear mixed models predicting the likelihood of leopard detection at camera stations in Kasungu National Park, Malawi, across all survey years (2016, 2017 and 2018) during a given 5-day sampling occasion. Each model log-likelihoods (logLik), number of parameters (K), delta AICc (ΔAICc), AICc weight (Wi), and cumulative AICc weights (Cum. Wi) are presented.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | *K* | AICc | ΔAICc | *W*i | Cum. *W*i | Log likelihood |
| Hyaena + Prey + Water | 5 | 1117.88 | 0.00 | 0.29 | 0.29 | -553.91 |
| Prey + Water | 4 | 1118.88 | 1.00 | 0.17 | 0.46 | -555.42 |
| Hyaena + Prey + Water + Habitat | 6 | 1119.47 | 1.59 | 0.13 | 0.59 | -553.70 |
| Hyaena + Prey + Water + Border | 6 | 1119.86 | 1.98 | 0.11 | 0.70 | -553.89 |
| Prey + Water + Habitat | 5 | 1120.51 | 2.64 | 0.08 | 0.78 | -555.23 |
| Prey + Water + Border | 5 | 1120.85 | 2.97 | 0.06 | 0.84 | -555.40 |
| Hyaena + Prey + Water + Border + Habitat | 7 | 1121.44 | 3.56 | 0.05 | 0.89 | -553.67 |
| Prey + Water + Border + Habitat | 6 | 1122.47 | 4.59 | 0.03 | 0.92 | -555.20 |
| Hyaena + Water | 4 | 1123.57 | 5.69 | 0.02 | 0.94 | -557.77 |
| Hyaena + Prey | 4 | 1124.37 | 6.49 | 0.01 | 0.95 | -558.17 |
| Water | 3 | 1124.94 | 7.06 | 0.01 | 0.96 | -559.46 |
| Hyaena + Water + Habitat | 5 | 1125.26 | 7.38 | 0.01 | 0.97 | -557.60 |
| Hyaena + Water + Border | 5 | 1125.32 | 7.44 | 0.01 | 0.98 | -557.63 |
| Prey | 3 | 1125.32 | 7.44 | 0.01 | 0.99 | -559.65 |
| Hyaena + Prey + Border | 5 | 1126.20 | 8.32 | 0.01 | 1.00 | -558.08 |
| Hyaena + Prey + Habitat | 5 | 1126.37 | 8.49 | 0.00 | 1.00 | -558.16 |
| Water + Border | 4 | 1126.66 | 8.78 | 0.00 | 1.00 | -559.31 |
| Water + Habitat | 4 | 1126.67 | 8.79 | 0.00 | 1.00 | -559.32 |
| Hyaena + Water + Border + Habitat | 6 | 1126.96 | 9.08 | 0.00 | 1.00 | -557.44 |
| Prey + Border | 4 | 1127.13 | 9.25 | 0.00 | 1.00 | -559.55 |
| Prey + Habitat | 4 | 1127.32 | 9.45 | 0.00 | 1.00 | -559.65 |
| Hyaena + Prey + Border + Habitat | 6 | 1128.19 | 10.31 | 0.00 | 1.00 | -558.06 |
| Water + Border + Habitat | 5 | 1128.35 | 10.47 | 0.00 | 1.00 | -559.15 |
| Prey + Border + Habitat | 5 | 1129.13 | 11.25 | 0.00 | 1.00 | -559.54 |
| Hyaena | 3 | 1130.32 | 12.44 | 0.00 | 1.00 | -562.15 |
| Hyaena + Border | 4 | 1131.80 | 13.92 | 0.00 | 1.00 | -561.88 |
| Hyaena + Habitat | 4 | 1132.33 | 14.45 | 0.00 | 1.00 | -562.15 |
| Border | 3 | 1133.04 | 15.16 | 0.00 | 1.00 | -563.51 |
| Habitat | 3 | 1133.61 | 15.73 | 0.00 | 1.00 | -563.80 |
| Hyaena + Border + Habitat | 5 | 1133.80 | 15.92 | 0.00 | 1.00 | -561.87 |
| Border + Habitat | 4 | 1135.04 | 17.16 | 0.00 | 1.00 | -563.50 |

**Table S2.** Overall summaries of binomial generalised linear mixed models predicting the likelihood of spotted hyaena detection at camera stations in Kasungu National Park, Malawi, across all survey years (2016, 2017 and 2018) during a given 5-day sampling occasion. Each model log-likelihoods (logLik), number of parameters (K), delta AICc (ΔAICc), AICc weight (Wi), and cumulative AICc weights (Cum. Wi) are presented.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | *K* | AICc | ΔAICc | *W*i | Cum. *W*i | Log likelihood |
| Leopard + Prey | 4 | 1243.14 | 0.00 | 0.18 | 0.18 | -617.55 |
| Prey | 3 | 1244.02 | 0.88 | 0.11 | 0.29 | -619.00 |
| Leopard + Prey + Habitat | 5 | 1244.61 | 1.47 | 0.09 | 0.38 | -617.28 |
| Leopard + Prey + Border | 5 | 1244.88 | 1.75 | 0.07 | 0.45 | -617.42 |
| Leopard + Prey + Water | 5 | 1245.02 | 1.89 | 0.07 | 0.52 | -617.49 |
| Prey + Habitat | 4 | 1245.51 | 2.37 | 0.05 | 0.57 | -618.74 |
| Prey + Border | 4 | 1245.72 | 2.59 | 0.05 | 0.62 | -618.84 |
| Prey + Water | 4 | 1245.98 | 2.84 | 0.04 | 0.66 | -618.97 |
| Leopard | 3 | 1246.29 | 3.16 | 0.04 | 0.70 | -620.14 |
| Leopard + Prey + Water + Habitat | 6 | 1246.40 | 3.27 | 0.03 | 0.73 | -617.17 |
| Leopard + Prey + Habitat + Border | 6 | 1246.41 | 3.27 | 0.03 | 0.76 | -617.17 |
| Leopard + Prey + Water + Border | 6 | 1246.77 | 3.63 | 0.03 | 0.79 | -617.35 |
| Prey + Habitat + Border | 5 | 1247.26 | 4.13 | 0.02 | 0.81 | -618.61 |
| Prey + Water + Habitat | 5 | 1247.41 | 4.27 | 0.02 | 0.83 | -618.68 |
| Leopard + Habitat | 4 | 1247.62 | 4.48 | 0.02 | 0.85 | -619.79 |
| Prey + Water + Border | 5 | 1247.68 | 4.54 | 0.02 | 0.87 | -618.81 |
| Leopard + Border | 4 | 1247.96 | 4.83 | 0.02 | 0.89 | -619.97 |
| Leopard + Prey + Water + Habitat + Border | 7 | 1248.20 | 5.06 | 0.01 | 0.90 | -617.05 |
| Leopard + Water | 4 | 1248.23 | 5.10 | 0.01 | 0.91 | -620.10 |
| Habitat | 3 | 1249.01 | 5.87 | 0.01 | 0.92 | -621.49 |
| Prey + Water + Habitat + Border | 6 | 1249.16 | 6.02 | 0.01 | 0.93 | -618.54 |
| Border | 3 | 1249.28 | 6.15 | 0.01 | 0.94 | -621.63 |
| Leopard + Habitat + Border | 5 | 1249.35 | 6.22 | 0.01 | 0.95 | -619.65 |
| Leopard + Water + Habitat | 5 | 1249.47 | 6.34 | 0.01 | 0.96 | -619.71 |
| Water | 3 | 1249.66 | 6.52 | 0.01 | 0.97 | -621.82 |
| Leopard + Water + Border | 5 | 1249.90 | 6.76 | 0.01 | 0.98 | -619.92 |
| Habitat + Border | 4 | 1250.69 | 7.56 | 0.00 | 1.00 | -621.33 |
| Water + Habitat | 4 | 1250.96 | 7.82 | 0.00 | 1.00 | -621.46 |
| Leopard + Water + Habitat + Border | 6 | 1251.20 | 8.07 | 0.00 | 1.00 | -619.57 |
| Water + Border | 4 | 1251.27 | 8.14 | 0.00 | 1.00 | -621.62 |
| Water + Habitat + Border | 5 | 1252.64 | 9.50 | 0.00 | 1.00 | -621.29 |