**A map of the world

Description automatically generated**

A picture containing background pattern

AI-generated content may be incorrect.

**A graph with black lines and white text

Description automatically generated**

Chart

Description automatically generated

A screenshot of a graph

Description automatically generated

A graph of a step

Description automatically generated

*A graph of steps

Description automatically generated*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Global 2 | | Global 1 | | Human | | Habitat | | Null | | Model Name | |
| log step length + log step length² + cosine turn angle | | log step length + log step length² + cosine turn angle | | log step length + log step length² + cosine turn angle | | log step length + log step length² + cosine turn angle | | log step length + log step length² + cosine turn angle | | Movement Parameters | |
| Developed + **Forest** + Herbaceous + Wetlands + **Cosine Aspect** +  Terrain Ruggedness | Developed + **Forest** + Herbaceous + Wetlands + **Cosine Aspect** +  Terrain Ruggedness | |  | | Developed + **Forest** + Herbaceous + Wetlands+  **Cosine Aspect** +  Terrain Ruggedness | |  | | Habitat Parameters | |
| **Distance to**  **Trail** | | **Distance to**  **Trail** | | **Distance to**  **Trail** | |  | |  | | Recreation  Parameters | |
| Distance to Trail: Human Activity | | Log step length : Human Activity  Log step length2: Human Activity | | Distance to Trail: Human Activity | |  | |  | | Interactions | |

Figure 1: Study area outside Salida, Colorado with inset showing location within the larger state. Overlaid layers include a land cover layer indicating forest (cross-hatches) and shrub (dots) habitats, mountain biking/hiking trails (white lines), trail counter locations (white circles with black dots), and the minimum convex polygon (MCP) of all deer locations.

Table 1: Candidate models fit to data. Explanatory variables fell into three categories: movement parameters, habitat parameters, and recreation parameters. Interactions between movement or habitat parameters and recreation parameters were included in some models. Bold type face indicates significant terms in the model.

Figure 2: Coefficient estimates of covariates from the top ranked model of deer habitat selection for the pooled dataset analysis. Habitat variables include land cover types -- developed, forest, herbaceous and wetland -- as well as terrain ruggedness (TRI) and cosine aspect. Distance to trail and rolling average of human activity are recreation covariates. This model includes interactions between rolling average of human activity and forest land cover selection. Asterisks (\*) represent estimates where p-value < 0.05.

Figure 3: Marginal effects plot of the interaction between rolling average of human activity and landcover type. Values above 1 indicate selection.

Figure 4: Coefficients estimates of covariates for the top-ranked model for both the day and night dataset analyses. Habitat covariates include land cover types -- developed, forest, herbaceous and wetland -- as well as terrain ruggedness (TRI) and cosine aspect. Distance to trail and rolling average of human activity (RA) are recreation covariates. The top model for both datasets included interactions between human activity (RA) and movement characteristics. Asterisks (\*) represent estimates where p-values < 0.5. Estimates for the day step selection analysis are represented in orange and estimates for the night step selection analysis are represented in blue.

Figure 4: Updated step length distributions for the day step selection analysis, modeled as a log-normal distribution, incorporating the interaction between rolling average of human activity and step length parameters. Three values of human activity were chosen for low human activity (orange), average human activity (blue) and high human activity (green). As human activity increases the probability of smaller steps increases.

Figure 5: Updated step length distributions for the day step selection analysis, modeled as a log-normal distribution, incorporating the interaction between rolling average of human activity and step length parameters. Three values of human activity were chosen for low human activity (orange), average human activity (blue) and high human activity (green). As human activity increases the probability of smaller steps decreases.

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| Global 2 | Global 1 | Human | Habitat | Null | Model Name |
| log step length + log step length² +  cosine turn angle | log step length + log step length² +  cosine turn angle | log step length + log step length² +  cosine turn angle | log step length + log step length² +  cosine turn angle | log step length + log step length² + cosine turn angle | Movement Parameters |
| Developed + **Forest** + Herbaceous Wetlands+ **Cosine Aspect** +  Terrain Ruggedness | Developed + **Forest** + Herbaceous Wetlands+ **Cosine Aspect** +  Terrain Ruggedness |  | Developed + **Forest** + Herbaceous Wetlands+ **Cosine Aspect** +  Terrain Ruggedness |  | Habitat Parameters |
| **Distance to**  **Trail** | **Distance to**  **Trail** | **Distance to**  **Trail** |  |  | Recreation  Parameters |
| Distance to Trail: Human Activity | Log step length : Human Activity  Log step length2: Human Activity | Distance to Trail: Human Activity |  |  | Interactions |

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| **Model Name** | **Movement Parameters** | **Habitat Parameters** | **Recreation Parameters** | **Interactions** |
| **Base** | Log Step Length + Log Step Length² + Cosine Turn Angle |  |  |  |
| **Habitat** | Log Step Length + Log Step Length² + Cosine Turn Angle | Developed + Forest + Herbaceous + Wetland + Cosine Aspect + Terrain Ruggedness |  |  |
| **Human** | Log Step Length + Log Step Length² + Cosine Turn Angle |  | Distance to Trail | Distance to Trail: Human Activity |
| **Global 1** | Log Step Length + Log Step Length² + Cosine Turn Angle | Developed + Forest + Herbaceous + Wetland + Cosine Aspect + Terrain Ruggedness | Distance to Trail | Log step length : Human Activity  Log step length2: Human Activity |
| **Global 2** | Log Step Length + Log Step Length² + Cosine Turn Angle | Developed + Forest + Herbaceous + Wetland + Cosine Aspect + Terrain Ruggedness | Distance to Trail | Forest: Human Activity |