Lab 6: Home Range and Resource Selection

Central question

Endangered FL Panthers have large home ranges in areas where there is also considerable human development. This movement potentially puts them at risk for human-wildlife interactions. Therefore, researchers have tracked several FL Panthers to determine their space use, the extent to which they use and/or avoid developed areas, and how much of their home range is within protected vs unprotected lands. You will be graded on your answers and your ability to produce clean, well commented R code that performs the tasks listed below.

Files: The data for this homework was all included in the class recitation (with the exception of the protected areas file).
Landcover raster: panther_landcover.grd
Florida Panther tracking locations: panthers.shp
Landcover reclassification scheme: resistance reclass.txt
Shapefile of protected areas: panther_publicland.shp

1. Home Range

Young (subadult) cats are known to move between protected and unprotected properties. Managers would like to know what proportion of the home ranges of subadults is on public (protected) land. They would further like to know how much the method used to measure the home range influence the estimate of the proportion of use on public land.

Instructions: Use the landcover provided, the protected areas file, and the tracking data for the subadult cats (age class = SA (for subadult)) with the following home range estimators: MCP, KDE (95th percentile), and Brownian Bridge KDE (95th percentile). (Hint: look at the help file for "crop" in the raster library)

In your response include:
1. one or more maps of young cat home ranges and protected areas
2. the proportional measures of use
3. your interpretation of the results, answering the question for managers.

2. Resource Use

Managers would also like to know if young Panthers, in particular, are avoiding developed land cover types.

Instructions: Use the landcover provided and the tracking data for subadult cats (age class is SA for subadult). The selection method that you use is up to you. Rather than comparing the results from different methods (as above), just use one approach and describe your approach with a justification of why you think this is the best approach to address the question.

Hint: for urban, land_sub==8

In your response include:
1. a description of and justification for the resource selection design approach and statistical test used to answer the question
2. the statistical results
3. your interpretation of the results, answering the question for managers.