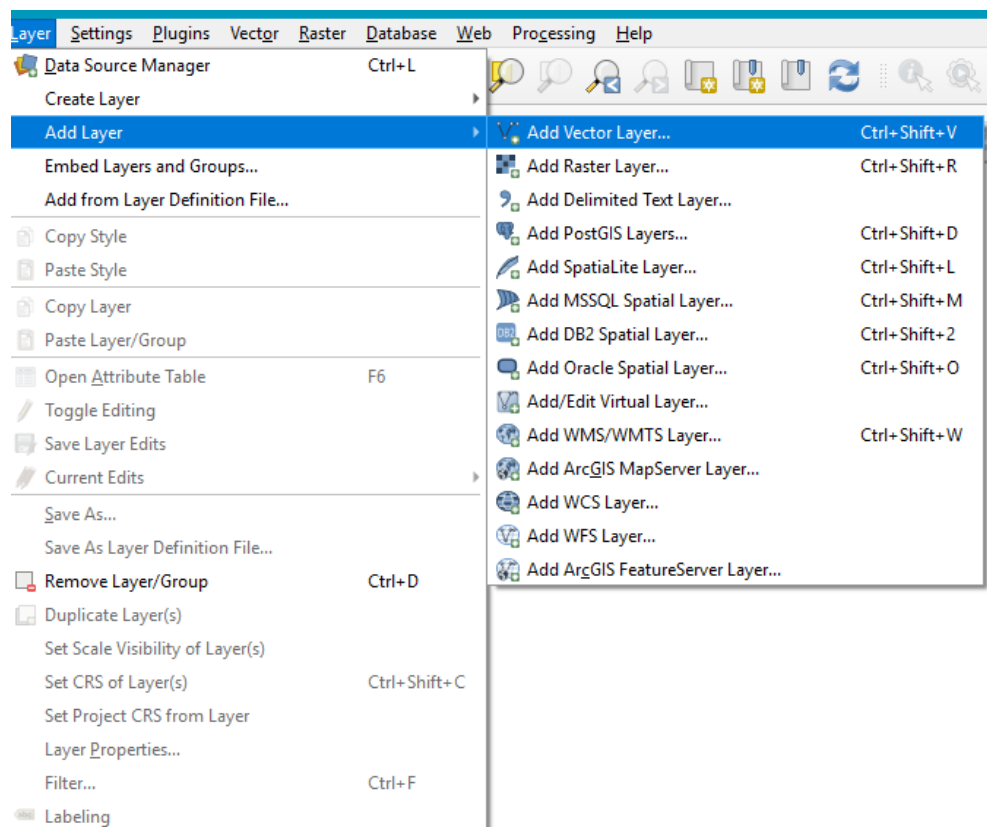


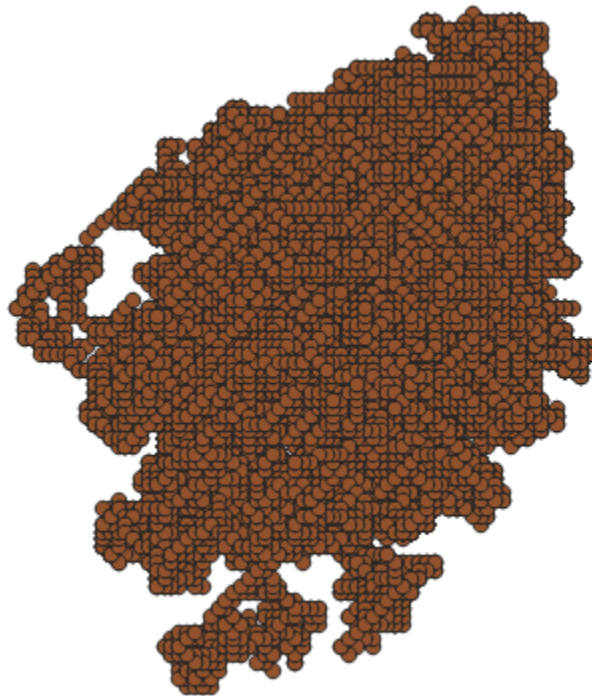
Replicating J. Mak's Thesis (8/15/18 Branch of FNNR-ABM-Primate on Github) Using QGIS

This guide replicates J. Mak's thesis (8/15/18 branch of FNNR-ABM-Primate on Github) using QGIS, an open-source GIS software suite. It skips some analysis steps, but shows tangible results after minimal setup. For fuller documentation, directions on how to run the updated model, or directions on how to run the model on ArcMap, view the FNNR-ABM User's Manual.

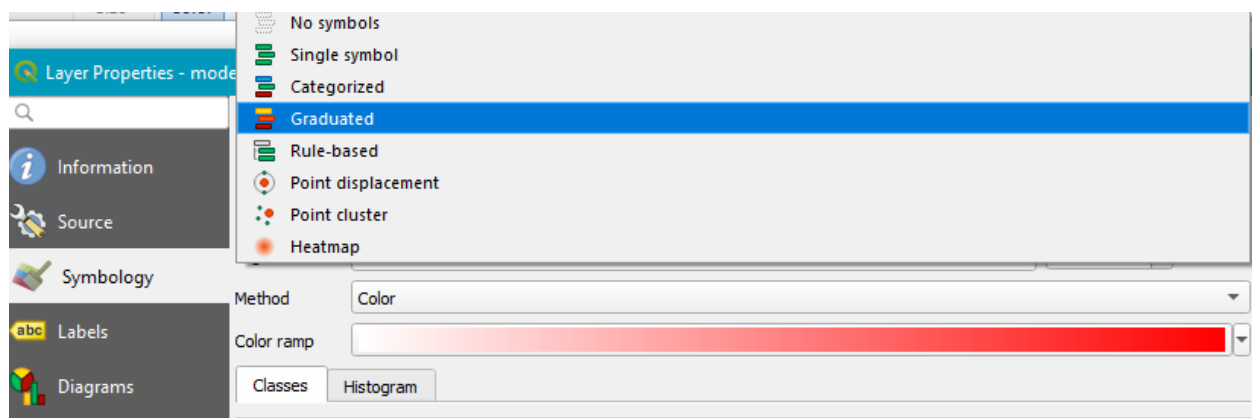
1. Completely set up Python; refer to the FNNR-ABM User's Manual for more information. Run the 8/15/18 model as-is using server.py; it should generate a file called 'export_density_plot_wo31.csv' (unless you changed certain variables) at the end of the 730 steps in the same directory the model folder is in.
2. Run 'convert_csv_to_shapefile.py'; if you named the generated file from Step 1 something other than 'export_density_plot_wo31.csv', this file will need to be edited to reference the right file. Without running this .py file, the model will simply only generate a .csv of a few thousand x-y coordinates.
3. Step 2 should've generated a shapefile called model_run.shp. Open QGIS.
4. Add 'model_run.shp' as a layer using the menu toolbar at the top; see screenshot below –



5. Accept the default coordinate system. Zoomed out, you should see a mass of dots like this:



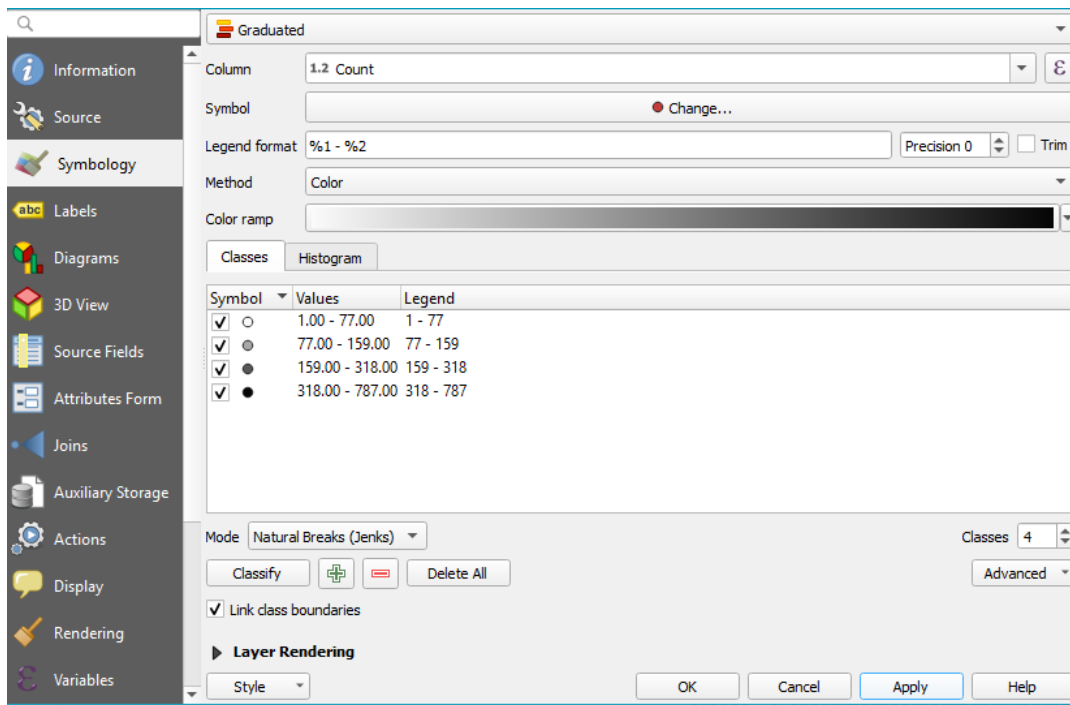
6. On the left side of your screen, you should see model_run in the Layers window. Right-click it and select 'Properties'. A window should pop up; select 'Symbology' from the left tab. Change the very top drop-down from 'Single Symbol' to 'Graduated'.



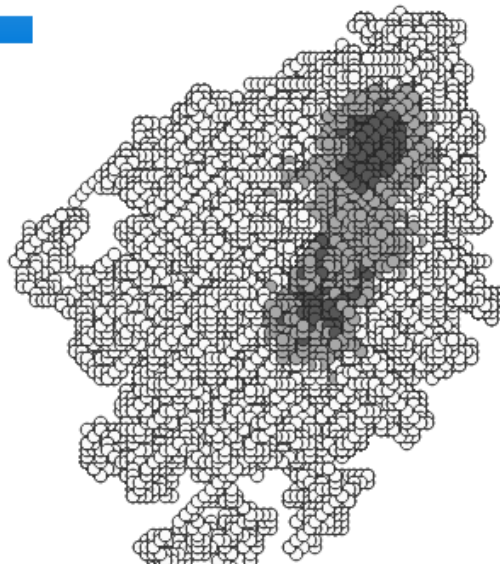
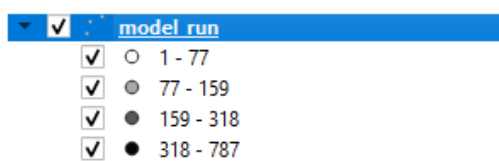
7. Right below the drop-down in step 6, select the Column 'Count'. If that isn't available, check to make sure the model and convert_csv_to_shapefile.py ran correctly.

8. Select the 'Greys' color ramp and the mode 'Natural Breaks (Jenks)'.

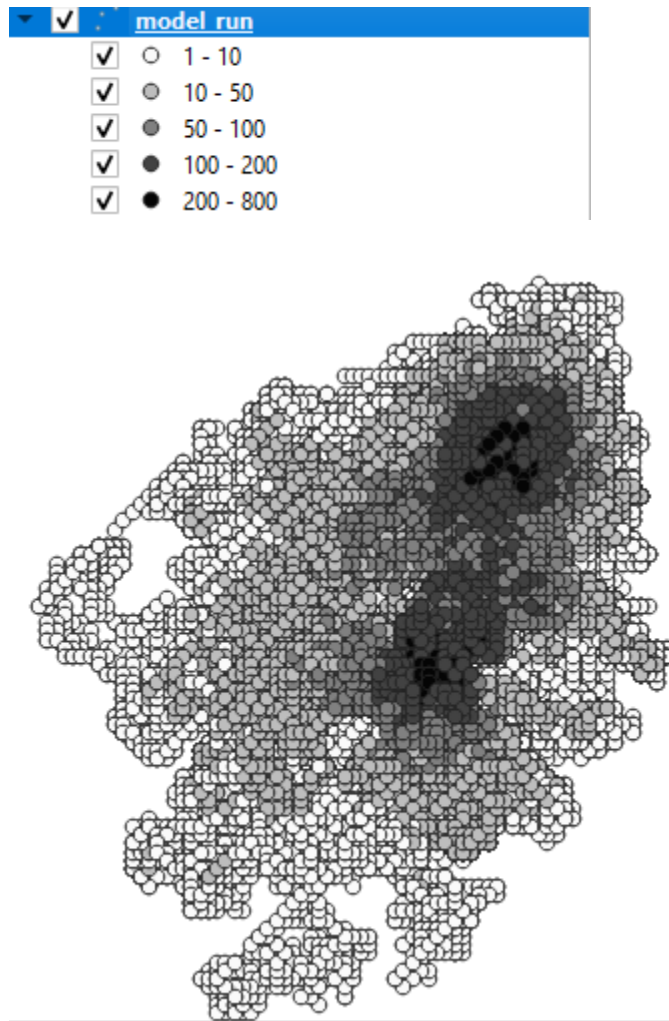
9. Click the 'Classify' button. 'Natural Breaks (Jenks)' may take a while to load, but no longer than a minute or so. Your window should now look like this, roughly:



11. Click 'Apply'. You should now see a rough proportional visualization of which areas of the Fanjingshan National Nature Reserve were most traveled-to by agents.



12. Adjust the zoom, legend, and symbology as needed. My original thesis only concerned the Yangaoping region, or the top 35% or so of the reserve, which is why the figures in my thesis look 'cut off' at the top region (it used another script called 'trim_grid35.py' to trim to only the Yangaoping region). Also note that this looks slightly different in QGIS than it does in ArcGIS.



Essentially, the legend is saying that agents traveled to the darker spots more often than they did to the light spots, particularly in the central and central-northeast regions of the reserve.

When I compare this to the Maxent image (which was generated using independent data), I see that the results are somewhat similar--activity is increased in the Yangaoping region--but in comparison, the Maxent analysis shows more activity in the northwest region of the reserve and less in the central region.

(For simplicity and demonstration's sake, this is a more qualitative and suggestive look at monkey habitat prediction comparison than what the 8/15/18 thesis suggests--the thesis focuses on a human settlement vs. absence of human settlement scenario rather than Maxent vs. heatmap comparisons.)

Contact the FNNR-ABM User's Manual under Documentation or the owner of the Github repository if you need further guidance.