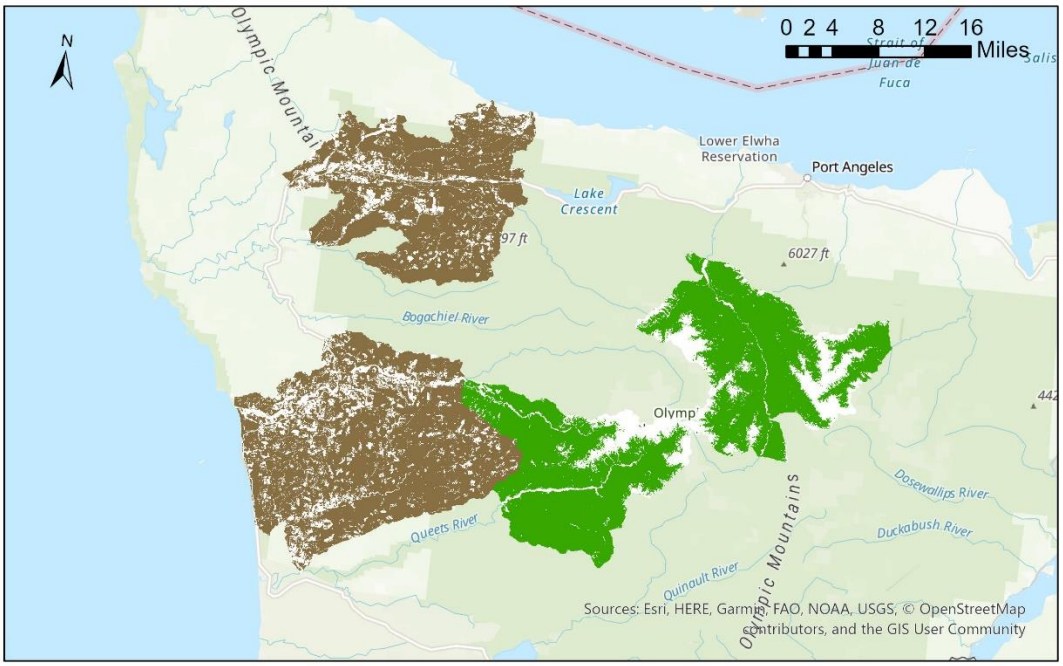
Workflow

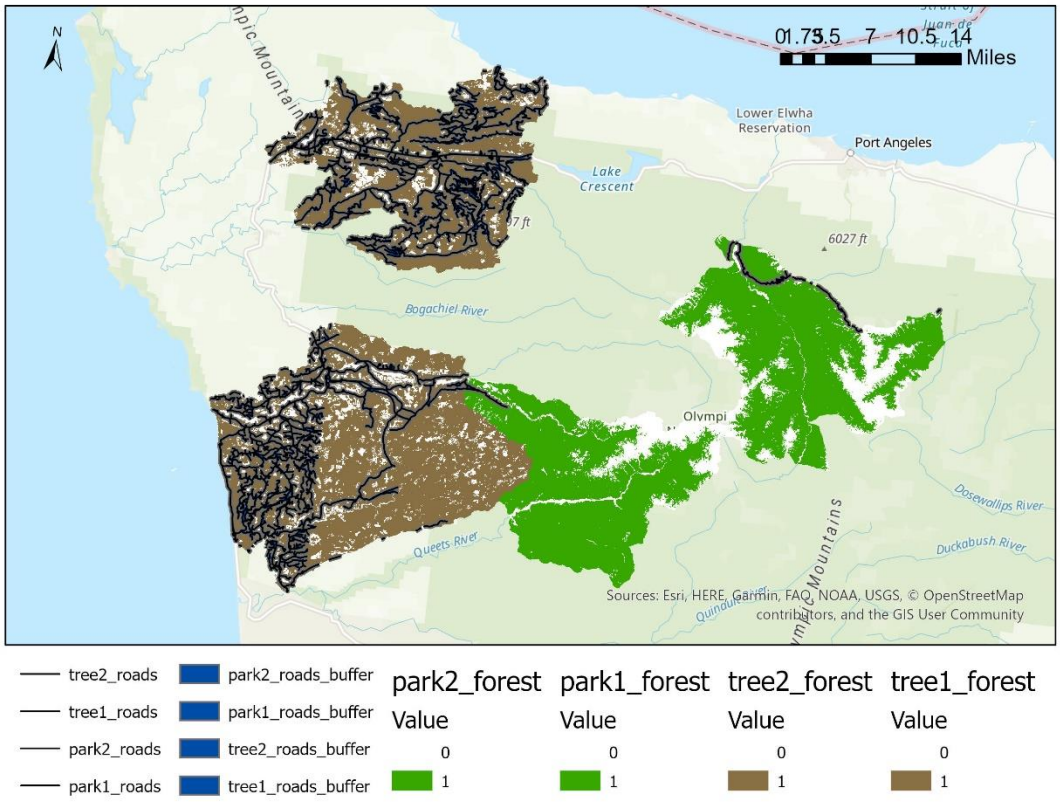
Part One:

- Add in nlcd raster
- Add in four shapefiles: tree1, tree2, park1, park2
- Make excel table from NLCD_Colour_Classification_Update (nlcd_legend.csv) -> Midterm_2020 folder
- Add Join (nlcd_legend) to nlcd raster
- Identify forest landcover types: 41, 42, 43 from attribute table
- Reclassify nlcd to nlcd_forest with just forest landcover types 41, 42, 43, as 1 and the rest as 0 -> midterm_lab.gdb
- Extract by Mask (nlcd_forest) raster to the four landscapes: tree1_forest, tree2_forest, park1_forest, park2_forest -> midterm_lab.gdb
- Raster to ASCII for four landscapes (tree1_forest.asc, tree2_forest.asc, park1_forest.asc, park2_forest.asc) -> asci_wh folder
- Open notepad and save landscapes (tree1_forest_nh.asc, tree2_forest_nh.asc, park1_forest_nh.asc, park2_forest_nh.asc) without header -> asci_nh folder
- Install Fragstats: frg_gui
- Run Fragstats metrics: forest_metrics.fca -> Fragstats folder
- Save run as and export to excel table: forest_metrics -> Fragstats folder
- Evaluate clumpiness and patch density between park1 and park2 with tree1 and tree2

Part Two:

- Add in roads shape file
- Clip to four raster landscapes (tree1_roads, tree2_roads, park1_roads, park2_roads) -> Midterm_2020 folder
- Buffer around the roads of 200m (tree1_roads_buffer, tree2_roads_buffer, park1_roads_buffer, park2_roads_buffer) -> midterm_lab.gdb
- Extract by Mask (tree1_buffer, tree2_buffer, park1_buffer, park2_buffer) -> midterm_lab.gdb
- Raster to ASCII (tree1_buffer.asc, tree2_buffer.asc, park1_buffer.asc, park2_buffer.asc) -> asci_wh folder
- Open notepad and save landscapes without header (tree1_buffer_nh.asc, tree2_buffer_nh.asc, park1_buffer_nh.asc, park2_buffer_nh.asc) -> asci_nh
- Open Fragstats
- Run Fragstats analysis: buffer_metrics.fca
- Save run as and add to excel table: forest_metrics -> Fragstats folder
- Subtract forest area of buffers from forest area of landscapes
- Divide forest area by total area
- Compare percent of forest landcover between tree and park landscapes


N
0 2 4 8 12 16
Miles
Lower Elwha Reservation
Port Angeles
Lake Crescent
6027 ft
Bogachiel River
Olymp
Dosewallips River
Duckabush River
Queets River
Quinault River
Olympic Mountains
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
park2_forest
Value
0
1
park1_forest
Value
0
1
tree2_forest
Value
0
1
tree1_forest
Value
0
1


N
0 1.75 3.5 7 10.5 14
Miles
Lower Elwha Reservation
Port Angeles
Lake Crescent
6027 ft
Bogachiel River
Olympi
Dosewallips River
Duckabush River
Queets River
Olympic Mountains
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
tree2_roads
tree1_roads
park2_roads
park1_roads
park2_roads_buffer
park1_roads_buffer
tree2_roads_buffer
tree1_roads_buffer
park2_forest
Value
0
1
park1_forest
Value
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1
tree2_forest
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0
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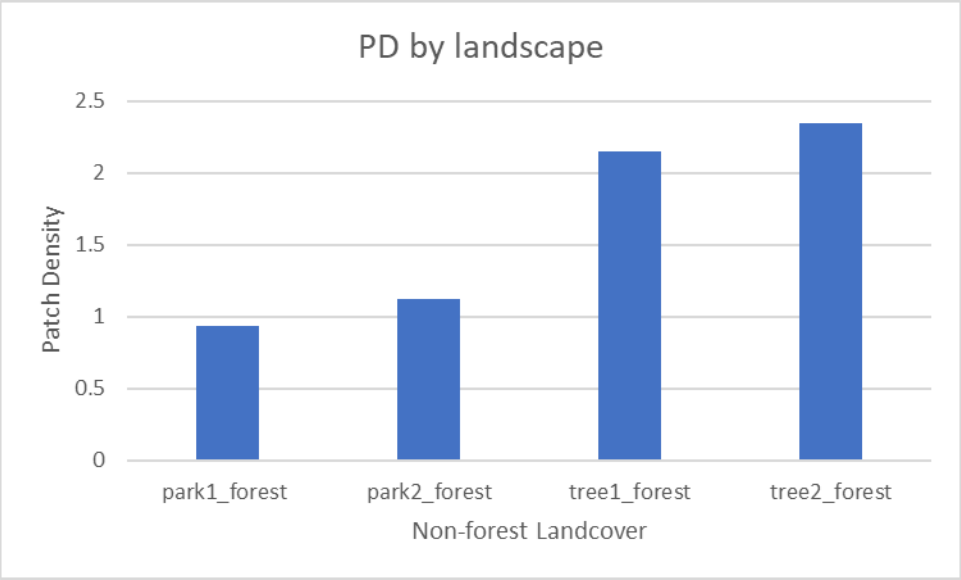
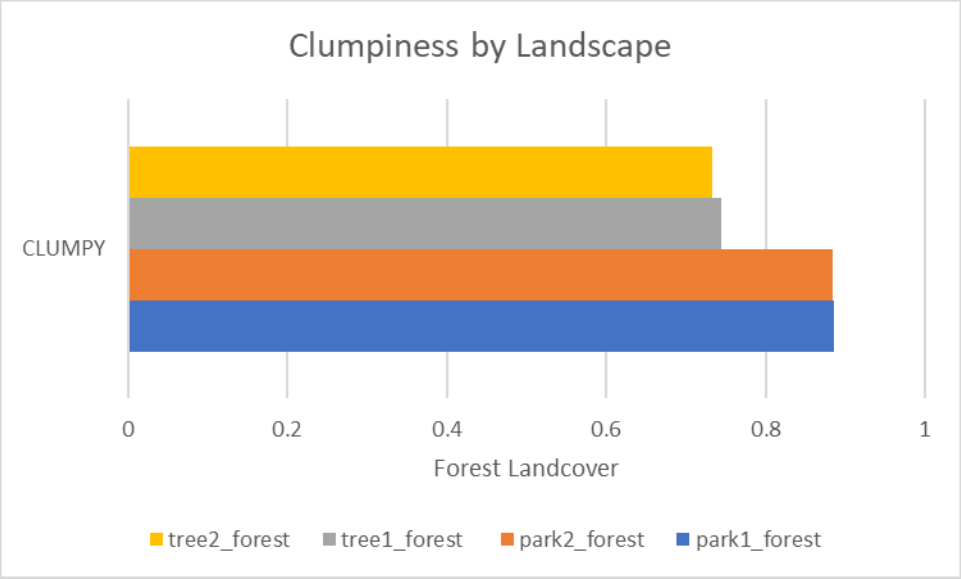
tree1_forest
Value
0
1

1. Please summarize the results of your analyses. What are the data showing?



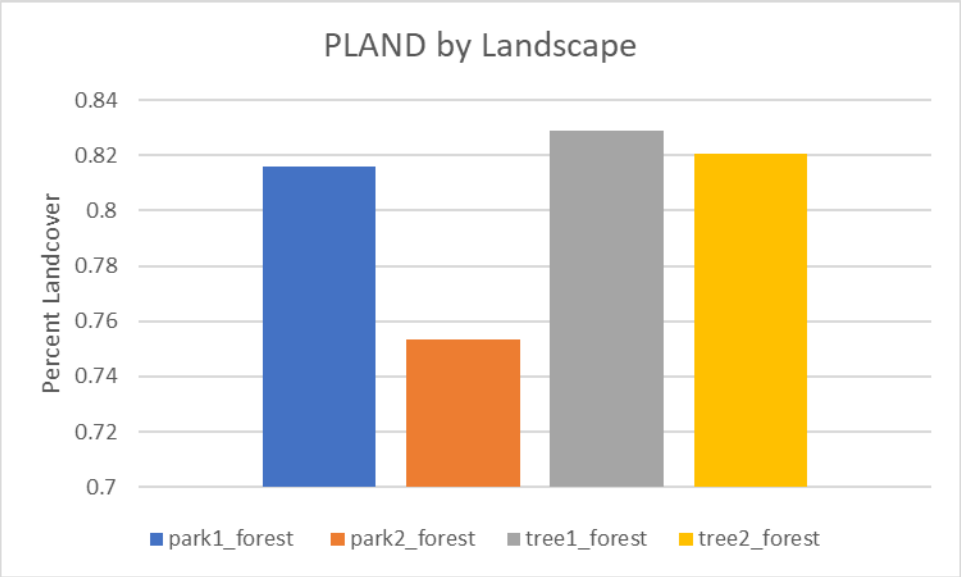
This bar graph shows the patch density of non-forest landcover for each of the forest landscapes: park1, park2, tree1, and tree2. From the graph we observe that the patch density of non-forest landcover is larger on average for tree1 and tree2 landscapes, which are the landscapes clear-cutting.



The chart above graphs the clumpiness index against the four landscapes. In this analysis, I only included the forest landcover. This shows that the forest landcover is more clumped for park1 and park2 which are the landscapes without clear-cutting.

Landscape	Forest Area	Total Area	Percent Landcover
park1_forest	35399.16	43380.63	0.816013045
park2_forest	37269.99	49465.26	0.753457881
tree1_forest	27628.92	33327.9	0.829002727
tree2_forest	48948.21	59652.99	0.820549146

The data in the table shows that there is not a significant difference between the proportion of forest landcover of areas with clear-cutting, tree1 and tree2, versus those without, park1 and park2.



The above graph depicts the same relationship between the proportion of forest landcover and the landscapes as the table.

2. Provide a conclusion. Do your results support or refute the two hypotheses?

For the first hypothesis my graphs and comparisons of landscape indices of patch density and clumpiness sufficiently show that clear-cutting does not replicate natural fragmentation processes. I would argue that even more than this, my data displays clearly that clear-cutting is harmful since it increases patch density of non-forest landcover and decreases clumpiness of forest landcover.

The second hypothesis is supported by my data, but I would still refute the wood industry's claim. By looking at the GIS maps I inserted, large patches of non-forest landcover in park1 and park2 can be easily seen. Yet despite this, the proportion of landcover is similar for the park landscapes and tree landscapes, meaning there is more dispersion of fragmentation in tree1 and tree2 that hasn't occurred in park1 and park2. Eventually I believe this fragmentation will continue to increase and affect the Spotted owl's available habitat.