Task 1

1.1

Task 1.1: Using the Ecosystem Type (EcosystemTypes.shp) and Protected Area layers (ProtectedAreas.shp), calculate the protection level category for each ecosystem type.

The protected area layer includes areas that have been degazetted. (These are areas that have previously been declared as a protected area but no longer contribute to the conservation estate.) Degazetted Protected Areas are flagged in the NBA\_PA\_Not column.)

The name of each ecosystem type is displayed in the Name\_18 field. The biodiversity target (expressed as a percentage) for each ecosystem type is displayed in the CNSRV\_TRGT field.

Please clearly document your workflow. You may either save your workflow as a GIS model, or otherwise document each step taken in a script or a text file. Save your outputs of.csv file.

To complete this task I would create an r script. In the script I would load the libraries sf (spatial manipulations) and tidyverse (data manipulations). Using these two packages I would load both datasets (ecosystem type and protected areas) and remove the z component of either spatial layer if there was one. I would then make sure that they had the same crs.

Once they had the same crs I would take the columns I required from the ecosystem type layer(name, area, conservation target) and protection area layer (name, area, gazette status). If there was no area given I would calculate the area of each polygon and add it as an extra column.

I would then get the intersection of each ecosystem with the protected areas and calculate the area of the intersecting polygon and add it as a column. I would use the area of intersection divided by the total area of the ecosystem times 100 to calculate the percentage of the ecosystem protected. I would then use the percentage of area protected divided by the conservation target times 100 to get the percentage of the ecosystem conservation target reached for each ecosystem and then save the output as a csv.