**Middleman Wildlife Modeling Process**

Jeff Erwin, GIS (jeffrey.erwin@usda.gov)

August 14, 2020

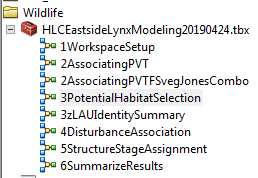
This document outlines the process I used to analyze wildlife for the Middleman project area. All processes and models reference the GIS request submitted by the Wildlife staff which is located here: *T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Documentation\Wildlife\200417\_MM\_Wildlife\_GIS\_Request\_INAUpdatedV2.docx*

**Lnyx Modeling**

**Data and tools used to model Lynx Habitat (Existing Condition)**

**Guidance:** I used the NRGG TG 15-4 v1.2 to guide the modeling process. Additionally, documents provided by Chip Fisher, Denise Pengeroth, and Laura Conway were used to adjust potential habitat from what was listed in the NRGG tech guide.

**Toolbox:** T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCEastsideLynxModeling20190424.tbx

I adjusted the models in the toolbox to reflect the ruleset provided by Denise. I also added a model to prioritize FSveg stand exam data and then fill in NULL’s with JonesPVT where FSVeg data did not exist. 

**Data (Covers CE boundary):**

1. FSVeg spatial pull from GI: FSVegSpR01ExtractVegetationPolygonRSW
2. VMap base edited: BBCEVMapV1920190329 (Edited VMap will have V19 appended)
3. Jones PVT 2004 Lookup table: HT\_PVT\_Lookup T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_default\_as\_myself.sde\S\_R01.PVT\_LOOKUP
4. Jones PVT 2004 Raster
5. Admin Raster
6. Flattened disturbance raster created in July of 2018: MTBS\_Cumm\_FltbyYrFACTS\_FlYr\_2017

**Ruleset (Provided by Wildlife):**

**Identify Potential Lynx Habitat (Model 3):**

Model 3PotentialHabitatSelection uses the **FSVJONESCOMBOPVT\_descrip** to select habitat type based upon the above listed ruleset. This field is a combination of FSVeg stand exam data and VMap JonesPVT data whereas FSVeg is prioritized and VMap JonesPVT is used to fill in where FSVeg data does not exist.

The tool also applies a 300 Meter buffer on primary habitat and selects any secondary habitat that intersects the 300 Meter buffer. I adjusted the tool to only include the secondary habitat within the buffer which reduced the original secondary habitat that was included with the old model.

**Primary habitat:** **FSVJONESCOMBOPVT\_descrip IN( 'abla1' , 'abla2' , 'abla3' ,'alba4', 'picea' )**

**Secondary habitat: FSVJONESCOMBOPVT\_descrip = 'psme2'**

**Identify Structural Stages (Model 5);**

[**Model5Notes**](file:///T:\FS\Reference\GeoTool\r01_hlc\Toolbox\NEPAProjectTools\Wildlife\LynxStructureModel5Notes20190501.docx)

[**Tech Guide Pages 18-21**](file:///T:\FS\Reference\GeoTool\r01_hlc\Toolbox\NEPAProjectTools\Wildlife\NRGG_TG_15-4_v1.3_EastsideLynxModels_17March2016.pdf)

**Lynx VEG S1**

**Guidance:** Meets VEG S1 (How much Lynx habitat is currently in an early stand initiation stage for all land ownerships.

**Toolbox:** Not needed yet. Union tool was used to union all data, GISAcres field was recalculated, table to excel function, excel converted to. xlsx, All acreage columns removed except GISAcres that was recalculated after the join.

**Products:** Spreadsheet and featureclass.

**Data:**

1. CE Boundary T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy
2. LAU T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Wildlife\_Lynx\S\_R01\_HLC.LynxAnalysisUnit
3. Treatment Polygons T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction
4. WUI T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Fire\_Management\S\_R01\_HLC.WUI\_HLC\_Combined
5. Ownership T:\FS\Reference\GeoTool\agency\DatabaseConnection\multiuse\_sde\_default\_as\_myself.sde\S\_USA\_MT.Ownership\_MSL\S\_USA\_MT.OwnerParcel\_MTDOR

**Lynx VEG S2**

**Guidance:** Meets VEG S2 (How much lynx habitat has been regenerated in the past 10 years on USFS lands only)

**Toolbox:** Not needed yet. Union tool was used to union all data, GISAcres field was recalculated, table to excel function, excel converted to. xlsx, All acreage columns removed except GISAcres that was recalculated after the join. FACTS layer was queried to only show regen harvest in the last ten years (>=2008). **The data showed no REGEN completed on or after 2008.**

**Products:** Spreadsheet and featureclass.

**Data:**

1. CE Boundary T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy
2. LAU T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Wildlife\_Lynx\S\_R01\_HLC.LynxAnalysisUnit
3. Treatment Polygons T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction
4. WUI T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Fire\_Management\S\_R01\_HLC.WUI\_HLC\_Combined
5. FACTSAllActivities (Regen >=2008) GI Pull

**ACTIVITY\_CODE IN('4101','4102','4110','4111','4112','4113','4114','4115','4116','4117','4120','4121','4122','4123','4131','4132','4133','4134','4140','4141','4142','4143','4144','4145','4146','4147','4148','4150','4151','4152','4154','4160','4162','4175','4176','4177','4183','4186','4192','4193'',4194','4195','4196') AND FISCAL\_YEAR\_COMPLETED >= 2008**

**Elk FP Hiding and Thermal Cover Standard 3**

**Guidance:** Since VMAP was edited I had to run a VMAP processing model that uses FACTS and Project Edited VMAP to create Habitat based upon VMAP fields. This model uses the field “TREECANOPY” to determine hiding and thermal cover which is the same as canopy cover except it is easier to use for a select statement since it has a numeric code. The intermediate step applied the patch size requirement (Standard 3) of <= 40 acres for Summer range HC and <=15 for Winter range TC.

**Model:** T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCWildlife20190604.tbx\ElkFPCoverIntermediate(Treecanopy)

**Intermediate Model Ruleset**

**(Model1ElkFPCoverIntermediate (TreeCanopy))**

Select “NonForage” "TREECANOPY" in ( 5000, 7000 ) water, sparse veg

Select “Forested” "TREECANOPY" = 4002 CTR 25-39.9%

Select “Forage” "TREECANOPY" in ( 3100 , 3300 , 8600 , 4001 ) herbaceous, shrub, Hardwood mix >40%,, CTR 10-24.9%

Select HC = HC AND TC = Forested "TREECANOPY" in (4003 , 4004) AND "TREESIZE" in (4100, 4200, 4300, 4400, 4500) AND NOT ((ACTIVITY\_CODE > '4100' AND ACTIVITY\_CODE < '4200') OR LOCAL\_QUALIFIER IN ('NF-HIGH SEVERTY', 'NATURAL FUELS')) CTR 40-59.9%, CTR>=60%, DBH 0-4.9”, DBH 5-9.9”, DBH 10-14.9”, DBH >=15”

Select TC "TREECANOPY" = 4004 AND "TREESIZE" in (4300,4400,4500) CTR>=60%, ”, DBH 10-14.9”, DBH >=15”

Select "ELKHCHAB" in ( 'HC' , 'HC\_SeedSap' ) AND "GISAcres" >=40

Select "ELKTCHAB" ='TC' AND "GISAcres" >=15

**Data:**

1. VMAP (Edited for project) T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Vegetation\MMVMapV1920190329
2. FACTS T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Activities\Activities160\_20191216\_Raw\_All

The result (existing condition) is a hiding cover and thermal cover feature class which are used in the following models to determine remaining hiding/thermal cover ***after treatment units have been erased***.

**Featureclass Results:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPThermalCover20200402

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPHidingCover20200402

I used a document from Laura Burns titled “FINAL Wildlife Model Process” dated 20180625 to assist in modeling efforts and in the future, I will convert those steps to our Forest Wildlife Modeling doc. Her document is located here: T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Project\_Toolbox\ FINAL\_Process\_Document \_Wildlife\_Analysis\_20180625

**Elk FP Remaining Hiding and Thermal Cover**

These models remove prospective treatment areas for the existing condition remaining hiding/thermal cover apply a patch size then apply a union with related data listed below. Although the models where run with success, each tool requires rework to facilitate more efficient time use. Be sure to identify remaining cover by: ElkHCbyInputAlt = 'FPHidingCover' or ElkTCbyInputAlt = 'FPThermalCover'

**Models:**

T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCWildlife20190604.tbx\2ElkRemainingFPTC

T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCWildlife20190604.tbx\3ElkRemainingFPHC

**Data:**

TreatmentUnits: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Elk Herd Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Elk\MMElkHerdUnits

Project Boundary Cumfx: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy

Ownership: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Ownership\MM\_OwnerParcel\_All20200402

Hiding cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPHidingCover20200402

Thermal cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPThermalCover20200402

**Rulesets:**

**"ForestPlanTC" = 'FPThermalCover' AND "GISAcres" >=15**

**"ForestPlanHC" = 'FPHidingCover' AND "GISAcres" >=40**

**Open Motorized Route Densities for Standard 4a (Elk)**

**For all herd units and the project area:**

1. Open motorized routes during the hunting season (10/15 – 12/1) by herd unit based on the rule set in **20200416\_MM\_Standard4aOpenMotorizedRouteDensityRuleSet** (provided separately) and weighted by public (1.00) and private (0.25).
2. Total road densities for all ownerships/restriction codes regardless of timing by herd unit and project (this can be used to describe closed roads, etc. in the herd unit for both the hunting season and habitat effectiveness)
3. Miles of motorized routes otherwise closed to the public between 10/15 and 12/1 that will be used administratively for this project by project and herd unit.
4. Miles of temporary roads by project and herd unit.

**Model:**

T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCWildlife20190604.tbx\ElkStandard4ARoadsTrailsDensity

**Documentation:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Documentation\Wildlife\20200416\_MM\_Standard4aOpenMotorizedRouteDensityRuleSet.docx

**Data:**

Roads: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation\RoadsWithCompleteInfraAttributes

Trails:

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Recreation\TrailsWithInfraAttributes

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy

Ownership: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Ownership\MM\_OwnerParcel\_All20200402

Elk Herd Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Elk\MMElkHerdUnits

**Road Rule Set**

1. Utilize the RoadsWithCompletedInfraAttributes at: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation.
2. From the field ROUTE\_STATUS, select EX-Existing. This will weed out any roads that may have been decommissioned.
3. From the field RESTRICTED\_USE\_ATM select the following values:
   1. Null
   2. 03-RES
   3. 03-RES-ALL
   4. 04-RES
   5. 07-RES
   6. 07-RES-ALL
   7. 13
   8. 14
   9. 14-RES
   10. 15
   11. 19-RES
   12. OPEN-HWY LEGAL
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and the JURISDICTION field = FS-FOREST SERVICE, select records where OPERATIONAL\_MAINT\_LEVEL is one of the following:
      1. 2 - HIGH CLEARANCE VEHICLES
      2. 3 - SUITABLE FOR PASSENGER CARS
      3. 4 - MODERATE DEGREE OF USER COMFORT
      4. 5 - HIGH DEGREE OF USER COMFORT
   2. If null select for where JURISDICTION equals private and select all records
   3. If null select for where JURISDICTION equals one of the following:
      1. BLM-BUREAU OF LAND MANAGEMENT
      2. BOR-BUREAU OF RECLAMATION
      3. C-COUNTY, PARISH, BOROUGH
      4. LOCAL
      5. S-STATE
      6. SH-STATE HIGHWAY
      7. SL-STATE LANDS
      8. UNKNOWN

THEN select records where OPERATIONAL\_MAINT\_LEVEL is one of the following:

1. 2 - HIGH CLEARANCE VEHICLES
2. 3 - SUITABLE FOR PASSENGER CARS

**Motorized Trail Rule Set**

1. Utilize the TrailsWithInfraAttributes at: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Recreation
2. From the field TRAIL\_STATUS, select EX-Existing.
3. From the field RESTRICTED\_USE\_ATM select the following values:
   1. M-07.00
   2. M-08.01-0112
   3. Null
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and DESIGNED\_USE field equals one of the following, select these records:
      1. 4WD>50-Four-Wheel Drive Vehicle>50
      2. ATV - ALL TERRAIN VEHICLE
   2. MTRCYCL – MOTORCYCLE

**Products:**

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\OpenRoadTrailDensElk20200421

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\OpenRoadTrailDensityFreq20200421

**Elk Habitat Effectiveness**

For all herd units and project area:

a) Open motorized routes during the summer (5/16 – 10/14) by herd unit and weighted by public (1.00) and private (0.25) based on the rule set in 20200416\_MM\_HabEffectOpenMotorizedRouteDensityRuleSet (provided separately).

b) Total motorized routes in each herd unit (all ownerships and restriction codes).

c) Miles of motorized routes otherwise closed to the public between 5/16 and 10/14 that will be used administratively for this project by project and herd unit.

d) Miles of temporary roads by project and herd unit (this is the same as (d) above.

**Documentation** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Documentation\Wildlife\20200416\_MM\_HabEffectOpenMotorizedRouteDensityRuleSet.docx

**Model** T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCWildlife20190604.tbx\ElkHabitatEffectiveness

**Road Rule Set**

1. Utilize the RoadsWithCompletedInfraAttributes at: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation.
2. From the field ROUTE\_STATUS, select EX-Existing. This will weed out any roads that may have been decommissioned.
3. From the field RESTRICTED\_USE\_ATM select the following values:
   1. Null
   2. 02-RES
   3. 02-RES-ALL
   4. 03-RES
   5. 03-RES-ALL
   6. 04-RES
   7. 05-RES
   8. 09-RES
   9. 10-RES
   10. 11-RES
   11. 13
   12. 14
   13. 14-RES
   14. 15
   15. 19-RES
   16. OPEN-HWY LEG 9/1-12/1
   17. OPEN-HWY LEGAL
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and the JURISDICTION field = FS-FOREST SERVICE, select records where OPERATIONAL\_MAINT\_LEVEL is one of the following:
      1. 2 - HIGH CLEARANCE VEHICLES
      2. 3 - SUITABLE FOR PASSENGER CARS
      3. 4 - MODERATE DEGREE OF USER COMFORT
      4. 5 - HIGH DEGREE OF USER COMFORT
   2. If null select for where JURISDICTION equals private and select all records
   3. If null select for where JURISDICTION equals one of the following:
      1. BLM-BUREAU OF LAND MANAGEMENT
      2. BOR-BUREAU OF RECLAMATION
      3. C-COUNTY, PARISH, BOROUGH
      4. LOCAL
      5. P-PRIVATE
      6. S-STATE
      7. SH-STATE HIGHWAY
      8. SL-STATE LANDS
      9. UNKNOWN

THEN select records where OPERATIONAL\_MAINT\_LEVEL is one of the following:

1. 2 - HIGH CLEARANCE VEHICLES
2. 3 - SUITABLE FOR PASSENGER CARS

**Motorized Trail Rule Set**

1. Utilize the TrailsWithInfraAttributes at: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Recreation
2. From the field TRAIL\_STATUS, select EX-Existing.
3. From the field RESTRICTED\_USE\_ATM select the following values:
   1. M-07.00
   2. M-08.01-0112
   3. M-08.02-0112
   4. M-10.00
   5. MT 10/15-5/31
   6. MT 10/15-6/30
   7. MT 5/16-10/14
   8. MT 5/16-8/31
   9. MT 9/8-6/30
   10. Null
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and DESIGNED\_USE field equals one of the following, select these records:
      1. 4WD>50-Four-Wheel Drive Vehicle>50
      2. ATV - ALL TERRAIN VEHICLE
      3. MTRCYCL – MOTORCYCLE

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkHabitatEffectiveness20200422

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkHabitatEffectiveness4b20200428

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkHabitatEffectiveness4c20200427

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkHabitatEffectiveness4d20200422

**Elk Security**

**For all herd units and the project area:**

1. Buffer open motorized routes between 9/1 and 12/1 by 1.2 miles to get security patches based on the rule set in **20200417\_MM\_ElkSecurityRuleSet**
2. Erase designated herd units with security patches to create elk security areas
3. Union the results of (a) with VMap
4. Union results with treatments

**Data**

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Vegetation\MMVMapV1920190329

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Elk\MMElkHerdUnits

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Recreation\TrailsWithInfraAttributes

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation\RoadsWithCompleteInfraAttributes

**Documentation**

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Documentation\Wildlife\20200417\_MM\_ElkSecurityRuleSet

**Model**

T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\HLCWildlife20190604.tbx\ElkSecurityAreas

This model needs to include the erase portion. Erasing Elk security output from designated elk herd units.

**Road Rule Set**

1. Utilize the RoadsWithCompletedInfraAttributes at: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation.
2. From the field ROUTE\_STATUS, select EX-Existing. This will weed out any roads that may have been decommissioned.
3. From the field RESTRICTED\_USE\_ATM select the following values:
   1. Null
   2. 02-RES
   3. 02-RES-ALL
   4. 03-RES
   5. 03-RES-ALL
   6. 04-RES
   7. 05-RES
   8. 09-RES
   9. 10-RES
   10. 13
   11. 14
   12. 14-RES
   13. 15
   14. 19-RES
   15. OPEN-HWY LEGAL
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and the JURISDICTION field = FS-FOREST SERVICE, select records where OPERATIONAL\_MAINT\_LEVEL is one of the following:
      1. 2 - HIGH CLEARANCE VEHICLES
      2. 3 - SUITABLE FOR PASSENGER CARS
      3. 4 - MODERATE DEGREE OF USER COMFORT
      4. 5 - HIGH DEGREE OF USER COMFORT
   2. If null select for where JURISDICTION equals one of the following:
      1. BLM-BUREAU OF LAND MANAGEMENT
      2. BOR-BUREAU OF RECLAMATION
      3. C-COUNTY, PARISH, BOROUGH
      4. LOCAL
      5. P-PRIVATE
      6. S-STATE
      7. SH-STATE HIGHWAY
      8. SL-STATE LANDS
      9. UNKNOWN

THEN select records where OPERATIONAL\_MAINT\_LEVEL is one of the following:

1. 2 - HIGH CLEARANCE VEHICLES
2. 3 - SUITABLE FOR PASSENGER CARS

**Motorized Trail Rule Set**

1. Utilize the TrailsWithInfraAttributes at: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Recreation
2. From the field TRAIL\_STATUS, select EX-Existing.
3. From the field RESTRICTED\_USE\_ATM select the following values:
   1. M-07.00
   2. M-08.01-0112
   3. M-08.02-0112
   4. M-10.00
   5. MT 10/15-5/31
   6. MT 10/15-6/30
   7. MT 5/16-10/14
   8. MT 9/8-6/30
   9. Null
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and DESIGNED\_USE field equals one of the following, select these records:
      1. 4WD>50-Four-Wheel Drive Vehicle>50
      2. ATV - ALL TERRAIN VEHICLE
      3. MTRCYCL – MOTORCYCLE

**Products**

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkSecurityAreas20200708

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkSecurityAreasTreatUnitsUnion20200708

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\ElkSecurityAreasVMap20200708

**Mule Deer**

**For the project area:**

1. Overlap (union) of mule deer winter range with the project area
2. Overlap (union) of treatments on mule deer winter range and the project area

**Data:**

Mule deer Winter Range: T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Wildlife\_MTFWP\S\_R01\_HLC.MuleDeer\_Dist

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy

Products: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMMuleDeer20200403.gdb\MMMuleDeerGWPrjAreaUnion20200403

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMMuleDeer20200403.gdb\MMMuleDeerPATreatGWPrjAreaUnion20200403

**Consistency with MA L-2 Standard (Elk)**

**For the project area:**

1. Union of FPTC by MA L-2 and by winter range
2. Treatment overlap (union) with all thermal cover and winter range in L-2
3. Remaining FPTC and winter range in L-2 (union).

**Note, all treatments will remove thermal cover.**

**Data:**

Thermal Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPThermalCover20200402

Management Areas: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ManagementAreas\ManagementAreas

Winter Range: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Elk\S\_R01\_HEL\_MtElkRange\_upd20191001\_DQwinhab\_diss

Remaining Thermal Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\RemainingTC20200402

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAL2FPTCGW20200410

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAL2TreatFPTCGW20200410

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAL2RemainFPTCGW20200410

**Consistency with MA T-2 Standard (Elk)**

**For the project area:**

1. FPTC by MA T-2 and by winter range (union)
2. Treatment overlap with all thermal cover in T-2 (union)
3. Treatment overlap with thermal cover on winter range in T-2 (union)
4. Remaining FPTC in T-2 (union). **Note, all treatments will remove thermal cover.**
5. Remaining FPTC on winter range in T-2 (union).

**Data:**

Thermal Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPThermalCover20200402

Management Areas: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ManagementAreas\ManagementAreas

Winter Range: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Elk\S\_R01\_HEL\_MtElkRange\_upd20191001\_DQwinhab\_diss

Remaining Thermal Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\RemainingTC20200402

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

**Products:**

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT2TreatFPTCGW20200410

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT2FPTCGW20200411

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT2RemainFPTC20200408

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT2RemainFPTCGW20200411

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT2TreatFPTCGW20200408

Consistency with MA T-3 Standard

**For the project area:**

1. FPHC by MA T-3 and project (union)
2. Treatment overlap with FPHC in T-3 (union)
3. Remaining FPHC in T-3 (union).

**Data:**

FP Hiding Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPHidingCover20200402

Management Areas: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ManagementAreas\ManagementAreas

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Remaining FP Hiding Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\RemainingHC20200403

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT3FPHCPrjArea20200408

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT3TreatFPHC20200408

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAT3RemainingFPHC20200408

Consistency with MA W-1 Standard

**For the project area:**

1. FPTC by MA W-1 and by winter range and project (union)
2. Treatment overlap with all thermal cover and winter range in W-1 (union)
3. Remaining FPTC on winter range in W-1 (union).

**Data:**

FP Thermal Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\FPThermalCover20200402

Management Areas: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ManagementAreas\ManagementAreas

Winter Range: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Elk\MMElkWinterRangeUpdated20200403

Project Boundary: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Remaining FP Thermal Cover: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\RemainingTC20200402

Products: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAW1FPTCGWPrjArea20200410

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAW1TreatFPTCGW20200410

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAW1RemainFPTCGW20200410

Consistency with MA W-2 Standard

**For the project area:**

1. Total acres of W-2
2. Total miles of motorized routes in W-2
3. Total miles of motorized routes in W-2 that are open at some time during the year
4. Miles of closed routes and/or temporary routes that will be used for project activities

**Data:**

Management Areas: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ManagementAreas\ManagementAreas

Roads: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation\RoadsWithCompleteInfraAttributes

Proposed Transportation: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Transportation\TransportationProposedAction

Products: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAW2Acres20200408

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMElkAnalysis20200403.gdb\MAW2ClosedTempRoads20200410

Goshawk Nesting and Foraging

For the project area and cumulative effects boundary:

1. (Union tool) Overlap of:
   1. Treatments
   2. Nesting habitat
   3. Foraging habitat
   4. Old growth
   5. Project area
   6. Cumulative effects boundary
   7. Ownership

**Note, nesting is based on the Goshawk\_NestHab\_Disturb\_Dec23\_2014\_DISS in the Forest Plan revision files. See also T:\FS\Reference\GeoTool\r01\Toolbox and T:\FS\Reference\GeoTool\r01\Toolbox\Eastside\_Assessment\_24nov2014.tbx\Goshawk\_Model. Foraging is based on the feature class ‘S\_R01\_HLC.Wildlife\_MIS\_10’ filed at SDE\_R01\_HLC, S\_R01\_HLC.Wildlife\_MIS.**

1. Total acres of nesting habitat in 40-acre patch sizes for the existing condition
2. Remaining acres of nesting habitat in 40 acres patch sizes, post treatment.

**Note, all treatments will remove nesting habitat.**

Ruleset for existing condition: ("DOM\_MID\_40" IN ( 8015, 8025) AND "TREECANOPY"IN (4002,4003, 4004) AND "TREESIZE" IN (4300, 4400) )or ( "DOM\_MID\_40" = 8055 and "TREECANOPY" IN (4003, 4004) AND "TREESIZE" IN (4200,4300, 4400))

Multiple documents where referenced to develop an existing condition for the project area. Listed below are docs that I used along with the above guidance:

Laura Burns Document : T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\FINAL\_Process\_Document \_Wildlife\_Analysis\_20180625.docx

T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Wildlife\NRGG\_TG\_14-3\_EA\_Goshawk.v1.pdf

Note: To produce existing conditions for the project I used the updated VMAP which includes disturbance updates up to 2017. Please see this [link](https://usfs.box.com/s/qr4bg40zcyd081imhqyww8vvi7lxmwc1) for VMAP disturbance updating

**Data:**

VMAP Update for disturbance: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Vegetation\MMVMapV1920190329

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Nesting Habitat: T:\FS\NFS\R01\Collaboration\HLCForestPlanRevision\FEIS\GIS\Data\EA\_WildlifeOutputsDec2014.gdb\Goshawk\_NestHab\_Disturb\_Dec23\_2014\_DISS

Foraging Habitat: T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Wildlife\_MIS\S\_R01\_HLC.Wildlife\_MIS\_10

Old Growth: T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Silviculture\S\_R01\_HLC.OldGrowth\_all\_HEL

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanProjectBdy

Cumulative Effects Boundary: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy

Ownership: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Ownership\MM\_OwnerParcel\_All20200402

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMGH20200416.gdb\MMGoshawkNestForageUnion20200415

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMGH20200416.gdb\GHNestHabExisting20200416

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMGH20200416.gdb\GHNestHabRemaining20200416

Goshawk Diversity Matrices *on hold as per TED 20200416*

For the project area:

1. (Union tool) Overlap of:
2. VMap 14 (as updated for the project)
3. Treatments
4. Project area

Goshawk PFAs (defer until after 2020 field season)

Data:

Updated VMAP: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Vegetation\MMVMapV1920190329

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanProjectBdy

Flammulated owl, pileated woodpecker, marten, hairy woodpecker

For the project area:

1. (Union) Overlap of:
   1. Treatments
   2. S\_R01\_HLC.Wildlife\_MIS\_10 layer
   3. Old growth
   4. Project area
   5. Cumulative effects boundary

**Note, habitat data for the various species listed are contained in the feature class ‘S\_R01\_HLC.Wildlife\_MIS\_10’ filed at SDE\_R01\_HLC, S\_R01\_HLC.Wildlife\_MIS.**

**Data:**

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

MIS 10: T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Wildlife\_MIS\S\_R01\_HLC.Wildlife\_MIS\_10

Old Growth: T:\FS\Reference\GeoTool\agency\DatabaseConnection\r01\_hlc\_default\_as\_myself.sde\S\_R01\_HLC.Silviculture\S\_R01\_HLC.OldGrowth\_all\_HEL

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanProjectBdy

Cumulative Effects Boundary: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanCumeFXBdy

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMMIS1020200415.gdb\MMMIS10TreatOGPrjCumfxUnion20200415

Wolverine

For the Big Belts and project area:

1. (Union) Overlap of:
   1. Treatments
   2. Persistent spring snow (Copeland’s model)
   3. Primary (Inman’s model)
   4. Maternal (Inman’s model)
   5. Male dispersal (Inman’s model)
   6. Female dispersal (Inman’s model)
   7. Project area
   8. Big Belts

*For wolverine, the Big Belts are the broader effects boundary*

**Data:**

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanProjectBdy

Big Belts: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMWolverine20200415.gdb\BigBeltsAdmin20200415

Copelands Snow Model: T:\FS\Reference\GIS\r01\_hlc\LayerFile\Wildlife\WolverineSnowJCopeland\_NA2009\_500m\_R1.lyr

Inman’s Model: T:\FS\Reference\GIS\r01\_hlc\LayerFile\Wildlife\WolverineHabitat2013\_Inman\_R1.lyr

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMWolverine20200415.gdb\MMWolverineUnion20200415

Grizzly

For each grizzly bear analysis unit (North Big Belts and Middle Big Belts) and the project area:

1. Grizzly bear secure habitat by grizzly bear analysis unit and project area which are patches at least 2,500 acres in size and 1/3 of a mile away from roads open to the public. **DONE**
2. Intersection of existing motorized routes with grizzly bear security areas.
3. of closed roads used for hauling and temporary roads with grizzly bear security areas.
4. (Union) Overlap of:
   1. Treatments
   2. VMap 14 (as updated for the project)
   3. Habitat Type (S\_R01\_HEL\_VegMaster, S\_R01\_HEL.HabitatTypes)
   4. Secure habitat
   5. Grizzly bear analysis units
   6. Project area

*For grizzly bear,* ***grizzly bear analysis units*** *are the broader effects boundary. For this project there are two: North Big Belts and Middle Big Belts.*

**Documentation**

T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Documentation\Wildlife\ 2019060620\_MM\_GrizzlyOpenMotorizedRouteDensityRuleSet

**Data:**

Treatment Units: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Treatments\TreatmentUnits\_ProposedAction

Project Area: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\ProjectBoundary\MiddlemanProjectBdy

Veg Master: T:\FS\Reference\GIS\r01\_hlc\LayerFile\Vegetation\Forest Created Veg Management Layers\VegMaster\_HEL.lyr

Habitat Types: T:\FS\Reference\GIS\r01\_hlc\LayerFile\Vegetation\Forest Created Veg Management Layers\HabitatTypes\_HEL.lyr

Grizzly Analysis Unit: T:\FS\Reference\GIS\r01\_hlc\LayerFile\Wildlife\GrizBearAnalysisUnits\_Zone123.lyr

Grizzly Security Areas: T:\FS\Reference\GIS\r01\_hlc\LayerFile\Wildlife\GrizBearSecureHabitat\_Zone123.lyr

VMAP 14 Edited: T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\Middleman2019NEPA.gdb\Vegetation\MMVMapV1920190329

**Ruleset**

**Road Rule Set**

1. Utilize the ‘Roads with completed linear road attributes’ from INFRA
2. From the field “ROUTE\_STATUS”, select ‘EX-Existing’. This will weed out any roads that may have been decommissioned.
3. From the field “RESTRICTED\_USE\_ATM” select the following values:
   1. Null
   2. 02-RES
   3. 02-RES-ALL
   4. 03-RES
   5. 03-RES-ALL
   6. 04-RES
   7. 05-RES
   8. 07-RES
   9. 07-RES-ALL
   10. 13
   11. 14
   12. 15
   13. MIXED-SNOW
   14. OPEN-HWY LEGAL
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and the JURISDICTION field = FS-FOREST SERVICE, remove from further consideration any values where the OBJECTIVE\_MAINT\_LEVEL is “1-BASIC CUSTODIAL CARE (CLOSED).
   2. If null and “JURISDICTION” field = “C-COUNTY, PARISH, BOROUGH”, “P-PRIVATE”, AND “SH-STATE HIGHWAY”, keep records.

In summary, any road with an existing route status where the (“RESTRICTED\_USE\_ATM” is 02-RES, 02-RES-ALL, 03-RES, 03-RES-ALL, 04-RES, 05-RES, 07-RES, 07-RES-ALL, 13, 14, 15, MIXED-SNOW, and OPEN-HWY LEGAL) or where the (“RESTRICTED\_USE\_ATM” is null and JURISDICTION is C-COUNTY, PARISH, BOROUGH, P-PRIVATE, AND SH-STATE HIGHWAY) or where the (“RESTRICTED\_USE\_ATM” is null and JURISDICTION is FS-FOREST SERVICE and the OPERATIONAL\_MAINT\_LEVEL is NOT “1-BASIC CUSTODIAL CARE (CLOSED)), these routes will be included in the records for the open road density calcs.

**Motorized Trail Rule Set**

1. Utilize the ‘Trail routes with linear events’ from INFRA
2. From the field “TRAIL\_STATUS”, select ‘EX-Existing’. This will weed out any motorized trails that may have been decommissioned.
3. From the field “RESTRICTED\_USE\_ATM” select the following values:
   1. M-07.00
   2. M-08.01-0112
   3. M-08.02-0112
   4. Null
4. Of the records selected in Step 3, the null records need additional filtering.
   1. If null and “JURISDICTION” field = “P-PRIVATE”, keep these records (note that JURISDICATION for the trails in Middleman is either FS-FOREST SERVICE or P-PRIVATE).

**Products:** T:\FS\NFS\HelenaLewisClark\Project\MiddlemanNEPA\GIS\Data\WildlifeAnalysis\MMGrizzly20200421.gdb\GrizzlyUnion20200421