**FINAL Wildlife Model Process**

Last edited June 25, 2018

FINAL\_Process\_Document\_Wildlife\_Analysis\_20180625 is filed here: T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Project\_Toolbox

This process document was created to answer the requests as listed in Example\_GIS\_Request\_INA\_Form\_TenmileWildlife\_20170206. This document is filed here: T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Forms

The models referred to in this document are filed in a Toolbox, HelenaWildlifeFX.tbx. The Toolbox is filed here: T:\FS\Reference\GeoTool\r01\_hlc\Toolbox\NEPAProjectTools\Project\_Toolbox

**Elk Security Analysis**

**Scale of Analysis: Elk Herd Unit, FS Elk Herd Unit and Project Boundary (IRA)**

**Note: IRA was added the final Unions for all analysis for TenmileSouth as a result of comments.**

***The following analysis will answer these requests*:**

1. Elk security by herd unit. This will include both security areas and intermittent refuge areas.
2. Total FPHC overlap with security and intermittent refuge areas

d) Overlap of treatments with elk security/intermittent refuge areas

1. Overlap of treatments with FPHC in elk security/intermittent refuge areas
2. Overlap of treatments with VMAP in security and intermittent refuge areas
3. MA overlap with FPHC and VMap in security and intermittent refuge areas
4. Overlap of treatments within MAs, FPHC, and VMap in security and intermittent refuge areas

**Model Name: Elk Security Areas Initial Model**

Process Description:

Note: This process is valid for Divide Travel, TenmileSouth Vegetation and Telegraph Vegetation; (Blackfoot Non-winter Travel process is different where noted)

For Direct and Indirect Effects:

Run the Elk Security Model with RES Code selections of choice by alternative (the model needs to be recoded for each alternative). The RES\_Codes often vary by project so it is useful to use the Description Code spreadsheet to see what they mean to know which ones to select in the model. This spreadsheet is filed in the Data/Documentation folder within each project folder on the T-drive. The elk herd unit input is named FSElkHerdUnits and it is the same as the existing ElkHerdUnits except they extend only to the forest boundary. Running the model is the first step and the output will be further edited.

The model for the security analysis is as follows: Conducted at the elk herd unit scale -->Select for patches greater than or equal to 250 acres (greater than or equal to 1000 acres for Blackfoot Travel) that are greater than or equal to a half mile from an open road. Open roads are ANY and ALL roads that are open during the hunting season (these dates may be variable – check with the wildlife bio), including private. The expression for RES\_CODE selection is created for each alternative for each project and the model is run for each alternative.

The following processes are conducted by hand:

Next process (this process was not conducted for Blackfoot Travel) Buffer outside private lands that have road access and are within the FSElkHerdUnits by ½ mile.

Union the modelled Elk Security with the PVT Buffer.

Delete all Non-Security and the private buffer overlap with Security and Security less than 250 acres.

Next process: Split the remaining Elk Security Blocks where they are constrained to less than ½ acre. Ask the wildlife bio to show you where to do the splits as it is not always clear.

Once the Elk Security Blocks are split, recalculate acres and add to Non-Security if less than 250 acres (if less than 1000 acres for Blackfoot Travel).

Create a final product by numbering each Elk Security Block individually and add a “Label” attribute field and code Elk Security that is 250 to 999 acres as “Intermediate Refuge Area” (no Intermediate Refuge Areas coded for Blackfoot Travel) and code ElkSecurity that is over 1000 acres as “Elk Security”.

For Cumulative Effects:

The Elk Security Model is run with the ElkHerdUnits as input. One will need to work with the biologist to determine Elk Security and Refuge Area outside the FS boundary, but within the Elk Herd Unit.

**Additional Analysis for Elk Security to answer a-g above (originally from the GIS request form):**

(You will need to find out from the biologist if the following analysis will be conducted with ElkHerdUnits or FSElkHerdUnits or completed for both.)

Union Elk Security by Alt (after modelled and edited) with the following: FSElkHerdUnits (those herd units that extend to FS Administrative Boundary) or ElkHerdUnits, ElkForestPlanHidingCover,

ManagementAreas, VMap14Base, IRAs, Combined Bdy and Treatments by Alt.

***The following analysis will answer these requests*:**

1. Miles of closed motorized routes in elk security (this will either be roads closed yearlong or seasonally during the hunting season)
2. Miles of closed motorized routes and/or temporary routes in security areas that will be used for project activities including decommissioning.

Union FSElkHerdUnits, ElkSecurity and Project Bdy and then Intersect with TravelRoutes (or use the Union from above). This data is presented with the RES\_CODE selections in the resulting spreadsheet.

***The following analysis will answer this request*:**

1. Percent security/intermittent refuge areas including temporary routes and closed routes that will be used for project activities. This would include recalculating security using the additional road use information for temporary road use and closed roads used for administrative purposes.

For each Alternative - Travel Routes that are closed, but open for project activities, as well as temporary routes are exported and then buffered by ½ mile. An attribute field will be added to each feature to indicate the Alt number. All of the Alt route buffers are Unioned to Project Boundary, Elk Security, FSElkHerdUnits, Elk Herd Units and Inventoried Roadless Areas.

**Elk Open Routes**

**Scale of Analysis: Elk Herd Unit and Project Boundary (IRA)**

***The following analysis will answer this request*:**

1. Open motorized routes during the hunting season (10/15 – 12/1)

**Model Name: FP Open Rte Den Hunting Season**

Create an Input.gdb and file these route layers in it. Also create an Output.gdb with a dataset named WildlifeFx and direct the model to these workspaces.

For the existing condition take a copy of the Travel Routes data add a field “Alt1Code”. Copy in the existing condition restriction codes. Private roads can be coded as OPEN-PVT. Code all of the temporary routes from all of the alternatives as “NA”.

The route input data also requires a ROAD \_TAG (10, Text) attribute field to be added and attributed as follows: “Public” for roads open during hunting season (the RES\_CODES vary by project), “Private” for roads with a jurisdiction of private and OPEN-PVT RES Code and leave as null for closed roads and for the Temporary routes coded as “NA”. Ask specialists if there are questions about road status.

In the model “Public” roads miles are weighted 100%, “Private” road miles are weighted by 25% and null roads are considered closed and weighted 0%.

The model calculates the miles of road open during hunting season as represented by the codes selected from attribute field that contains the RES\_CODE in this case “Alt1Code” and weighted by the ROAD\_TAG field. The result codes the Open-Road-Density attribute field (which is actually Sum of Open Routes). Further calculation is required for density: Select these roads by Elk Herd Unit and calculate total miles of road by square miles of the Elk Herd Unit – completed by Wildlife biologist.

***The following analysis will answer this request*:**

1. ‘Open’ road densities during the hunting season (10/15 – 12/1) including temporary routes and closed routes used for project implementation.

**Note**: One must be aware that a non-motorized routes may be used for Haul during project implementation.

Copy the open route input layer created from the process described above and add an Alt\*Code attribute field for each alternative. Field calculate the Alt1Code values into each field and then, by alternative, code the “Temp Routes”. Remember to put a placeholder code where there are temp routes in one alternative, but not another. Select routes used for haul and temporary routes and code ROAD\_TAG attribute field that is null as “Public” (some of the fields may already be coded as Private – leave those as is). The model initially selects by RES\_CODE (make sure non- motorized routes are included), to make sure all of the closed and haul routes are selected, select all closed routes and then reselect on “Public” where haul then re-code them as “haul” in the RES\_CODE attribute field. The model would then need to be altered to add “haul” to the list of RES\_CODE selected. The model is recoded and run for each alternative route input.

***The following analysis will answer these requests*:**

1. Total road densities for all ownerships/restriction codes regardless of timing by herd unit (this can be used to describe closed roads, etc. in the herd unit for both the hunting season and habitat effectiveness)
2. Miles of motorized routes otherwise closed to the public between 10/15 and 12/1 that will be used administratively for this project. This could include existing closed roads and/or temporary roads being built for the project and will most likely vary by alternative.

Union Project Boundary and ElkHerdUnits and then Intersect with TravelRoutes (with all of the Alt\*Code attribute fields). Data is presented with the RES\_CODE selections in the resulting spreadsheet.

Note: Watch for double-counting miles when conducting an INTERSECT where lines are coincident. An example is Elk Herd Unit Boundaries and roads. Miles will be included for both Elk Herd Units.

**Elk Habitat Effectiveness**

**Model Name: FP Open Rte Den Elk Habitat Effectiveness**

Process Description:

There are two scenarios for this analysis depending on the wishes of the Wildlife Biologist. The analysis is for **open motorized** routes during the summer (5/16-10/14). In the case of Divide and TenmileSouth the analysis will be completed similarly as the Open Routes above with the RES Codes that apply to (5/15-10/14). This analysis requires the creation of a road input data layer for each alternative if the restriction codes as described above and PVT routes count as 25% during the modelling process. Create an Input.gdb and file these route layers in it. Also create an Output.gdb with a dataset named WildlifeFx and direct the model to these workspaces.

Use the same open route data input data as created for the Open Route analysis. The model would then need to be altered to add “haul” to the list of RES\_CODE selected. Note that the RES\_CODe selections in the model are now for the 5/16 to 10/14 timeframe so the model selections are not the same as for Open Route analysis. The model is recoded and run for each alternative route input.

The second scenario is completing a **total open motorized** routes by selecting the applicable RES Code for open 5/16-10/14. No model is run and all open motorized routes count as 100% regardless of jurisdiction during elk summer season.

Roads with RES\_CODES and Alternative Route Treatments Intersected with ElkHerdUnits – answers **total open** route requests and by alternative by using RES\_CODE selections in the resulting spreadsheet.

***The following analysis will answer these requests*:**

1. Total road densities for all ownerships/restriction codes regardless of timing by herd unit (this can be used to describe closed roads, etc. in the herd unit for both the hunting season and habitat effectiveness)
2. Miles of motorized routes otherwise closed to the public between 10/15 and 12/1 that will be used administratively for this project. This could include existing closed roads and/or temporary roads being built for the project and will most likely vary by alternative.

Union Project Boundary and ElkHerdUnits and then Intersect with TravelRoutes (with all of the Alt\*Code attribute fields). Note – this is the same analysis as for Open Routes. The final spreadsheet form that analysis can be copied and renamed. The data is presented by updating the RES\_CODE selections in the spreadsheet to account for the 5/16-10/14 timeframe.

**Elk Hiding Cover**

**Scale of Analysis: Elk Herd Unit and Project Boundary (IRA)**

**Note:** The initial data may need to be edited to remove hiding cover if a recent fire has occurred within the Combined Boundary.

***Note: All of the Elk Hiding Cover analysis is discussed individually below, however, all of the analysis can be derived from a single Union of Project Boundary, Forest Plan Hiding Cover, Elk Herd Units, Treatments (by Alt) Remaining FP Hiding Cover (by Alt) Management Areas and Inventoried Roadless Areas.***

***The following analysis will answer this request*:**

1. Overlap of treatments on FPHC by herd unit and by BLM/FS

**Note the input data must include complete polygons of Elk FPHC along the EHU to ensure they are included in the analysis (40 ac polygon). When the data is prepared for the project library ensure the extent of the data includes the full connected polygons of hiding cover (Select (Elk Hiding Cover) by location (CombBdy and Intersect) works better than clipping.**

Union ForestPlanHidingCover with ElkHerdUnits and Treatments (Ownership) (Project boundary)

**Model Name: Ex Forest Plan Hiding Cover and output is ExFPHiding**

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

**Elk Hiding Cover (remaining)**

***The following analysis will answer this request*:**

1. Remaining acres of FPHC by herd unit (note that this will reflect the 40 acre patch sizes)Note, all logging (except precommercial thinning) and prescribed fire (including shaded fuel breaks and private land buffers) will remove hiding cover. Also note that it’s not necessary to provide this by ownership.

**Model Name: Remaining FP Hiding Cover and output is ElkHCbyInputAlt**

**Note:** The initial data may need to be edited to remove hiding cover if a recent fire has occurred within the Combined Boundary.

The Elk Forest Plan Hiding cover data in SDE has the requirement for 40 acre patch size included in the output. This is the process for analysis that requires the “remaining” hiding cover in 40 acre patches or greater. This would be “what’s left” after timber harvest or burning activities. The Wildlife Biologist will first determine what treatments remove hiding cover – for example regeneration harvest. Once that has been determined the hiding cover model can be coded so that it erases just those treatment units. The model will need to be run for each alternative. The Elk Hiding Cover Model processes include: Union input data, Erase selected treatments from Elk Hiding Cover, Multipart to Single Part, Dissolve Elk Hiding Cover and recalculate ArcAcres. Elk remaining Hiding Cover greater than or equal to 40 ac is selected as the Model Output.

Union ElkHidingCover Remaining with ElkHerdUnits and Project Boundary. Create an attribute field for Remaining HC by Alt.

**Model Name: Ex Forest Plan Remaining Hiding Cover and output is ExFPRemainingHiding**

**Consistency with MA T3 Standard**

***The following analysis will answer this request:***

1. Treatment overlap with FPHC in T3.
2. Remaining FPHC in T3. Note, all logging (excluding precommercial thinning) and prescribed fire (including shaded fuel breaks and private land buffers) will remove hiding cover.

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

Union of the following: Project Boundary, MangementAreas, Treatments by Alt, ElkForestPlanHidingCover and Remaining FPHC by Alt.

**Model Name: Consistency with MA Standard and output is MAConsistency (Remaining FPHC would have to be added as an input variable to the model)**

**Elk Thermal Cover**

**Scale of Analysis: Elk Herd Unit and Project Boundary (IRA)**

**Note:** The initial data may need to be edited to remove thermal cover if a recent fire has occurred within the Combined Boundary.

***Note: All of the Elk Thermal Cover/Management Area analysis is discussed individually below, however, all of the analysis can be derived from a single Union of Project Boundary, Forest Plan Thermal Cover, Elk Herd Units, Treatments (by Alt) Remaining FP Thermal Cover (by Alt), Elk Distribution, Management Areas and Inventoried Roadless Areas.***

***The following analysis will answer these requests*:**

1. Overlap of treatments with total FPTC by herd unit and by BLM/FS
2. Overlap of treatments on winter range by herd unit and by BLM/FS
3. Overlap of treatments with FPTC on winter range by herd unit and by BLM/FS

**Note the input data must include complete polygons of Elk FPTC along the EHU to ensure they are included in the analysis (15 ac polygon). When the data is prepared for the project library ensure the extent of the data includes the full connected polygons of thermal cover (Select (Elk Thermal Cover) by location (CombBdy and Intersect) works better than clipping.**

**Note**: ElkDistribution is the winter range feature class to use when asked for thermal cover in winter range.

Union ElkForestPlanThermalCover with the following: Project Boundary, ElkHerdUnits, ElkDistribution and Treatments by Alt. (Ownership) also Management Areas for additional analysis requests.

**Model Name: Ex Forest Plan Thermal Cover. Output is ExFPThermal**

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

**Elk Thermal Cover (remaining)**

**Model Name: NONE**

**Note:** The initial data may need to be edited to remove thermal cover if a recent fire has occurred within the Combined Boundary.

***The following analysis will answer these requests*:**

1. Remaining acres of total FPTC by herd unit and by BLM/FS
2. Remaining acres of FPTC on winter range by herd unit Note, all logging (including precommercial thinning) and prescribed fire (including shaded fuel breaks and private land buffers) will remove thermal cover. Also note that it’s not necessary to provide this by ownership.

The Elk Forest Plan Thermal cover data in SDE has the requirement for 15 acre patch size included in the output. This is the process for analysis that requires the “remaining” thermal cover in 15 acre patches or greater. This would be “what’s left” after timber harvest or burning activities. The Wildlife Biologist will first determine what treatments remove thermal cover – for example all harvest treatments. The analysis process (for each alternative) is as follows: Erase treatments from the Elk Forest Plan Thermal Cover, complete a Multi Part to Single Part, Dissolve single part on the resulting Elk Thermal Cover and recalculate ARC\_ACRES. Add an attribute field named Alt\*RemainFPTC and attribute with YES/NO. Elk Remaining Thermal Cover greater than or equal to 15 acres is the final output.

Union ElkForestPlanThermalCoverRemaining by Alt with ElkHerdUnits, ElkDistribution and Project Boundary

**Model Name: Ex Forest Plan Remaining Thermal Cover and output is RemainingFPThermal.**

**Consistency with MA W1, H-1, H-2, L-2 Standard**

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

***The following analysis will answer this request*:**

1. Treatment overlap with all thermal cover.
2. Treatment overlap with thermal cover on winter range in (W-1, H-1, H-2, L-2)
3. Remaining FPTC in (W-1, H-1, H-2, L-2)
4. Remaining FPTC in winter range in (W-1, H-1, H-2, L-2)

Union of the following: Project Boundary, MangementAreas, ElkForestPlanThermalCover, Remaining FPTC by Alt, ElkDistribution and Treatments.

**Model Name: Consistency with MA Standard and output is MAConsistency (Remaining FPTC would have to be added as an input variable to the model)**

**Elk Winter Range**

**Scale of Analysis: Project Boundary and Elk Herd Units**

***The following analysis will answer this request*:**

Total routes in winter range and then closed/open for implementation in winter range by alternative and EHU. (Additional request)

Union Project Boundary, ElkHerdUnits, Elk Distribution and then Intersect with Travel Routes. This data is presented with RES\_CODE selections in the resulting spreadsheet.

**Goshawk Potential Nesting and Foraging**

**Scale of Analysis: Project Boundary and Combined Boundary (IRA)**

**Model Name: NONE**

**Note:** The initial data may need to be edited to remove goshawk nesting/foraging if a recent fire has occurred within the Combined Boundary.

***The following analysis will answer this request*:**

1. Total acres of nesting and foraging habitat in the project area by ownership.
2. Total acres of old growth habitat that overlaps with nesting or foraging in the project area.
3. Overlap of treatments on nesting and foraging habitat (and old growth that overlaps if applicable)

Export Goshawk Nesting and Foraging Data (and Pileated Woodpecker Habitat) from MISWildlife10.

Union of the following: Combined Boundary, Project Boundary, OwnershipPoly, OldGrowth, Treatments by Alt and Exported Nesting and Foraging Data. (Note: Pileated Woodpecker Habitat can also be exported and Unioned with this data to answer the Old Growth/Pileated Habitat separate request).

***The following analysis will answer this request*:**

1. Total acres of nesting habitat in 30 acres patch sizes
2. Total acres of nesting habitat in 40 acre patch sizes

To answer Total Acres of Nesting Habitat in patches: Dissolve Exported Nesting Habitat and select single part. Recalculate ARC\_ACRES. Create a new attribute fields “GoshawkNest40”, “GoshawkNest30” and “GoshawkNestNot4030”. Field calculate the appropriate acre polygons to each field. (For TenmileSouth I created two feature classes).

**Goshawk Potential Foraging Habitat (remaining)**

**Model Name: NONE**

*Not requested for TenmileSouth*:

The Goshawk Foraging Habitat is included as one of the MISWildlifeSpecies10 in SDE. To isolate only the foraging habitat select GoshawkForaging and export only that data. Note that sometimes the MISSpecies10 data will require some editing if a recent fire needs to be accounted for and habitat removed from that data layer initially.

Erase all treatments that remove foraging habitat. The Wildlife Biologist will determine what treatments remove foraging habitat.

Dissolve on GoshawkForaging singlepart features.

Add RemainGHForHabitat attribute field. Field calculate with “RemainGHForHabitat”.

Add ARC\_ACRES attribute field and calculate geometry for acres.

Note there is no polygon acre size requirement for Goshawk Foraging Habitat so all polygon are considered habitat.

**Goshawk Potential Nesting Habitat (remaining)**

**ModelName: NONE**

***The following analysis will answer this request*:**

1. Remaining acres of nesting in 30 acre patch sizes. Note, all logging (including precommercial thinning) and prescribed fire (including shaded fuel breaks and private land buffers) will remove thermal cover.
2. Remaining acres of nesting habitat in 40 acre patch sizes. Note, all logging (including precommercial thinning) and prescribed fire (including shaded fuel breaks and private land buffers) will remove thermal cover.

The Goshawk Nesting Habitat is included as one of the MISWildlifeSpecies10 in SDE. To isolate only the nesting habitat select GoshawkHabitat and export only that data. Note that sometimes the MISSpecies10 data will require some editing if a recent fire needs to be accounted for and habitat removed from that data layer initially.

Erase treatments that remove nesting habitat to be determined by the Wildlife Biologist. Need to copy the treatments data and delete all of the treatments that do not remove nesting habitat as an intermediate data layer. This data will then be used as the Erase layer in the tool.

Dissolve on GoshawkHabitat singlepart features.

Add “RemainGHNest40Habitat”, “RemainGHNest30NestHabitat” attribute fields.

Add ARC\_ACRES attribute field and calculate geometry for acres.

Field calculate Remain40GHNestHabitat that is 40 acres or greater, Remain30GHNestHabitat that is 30 acres or greater. Field calculate the rest of the polygons that are less than 40 acres or 30 acres respectively as “NotGHNestHabitat”. (For TenmileSouth I created two feature classes).

**Goshawk Diversity Matrices**

**Scale of Analysis: Project Boundary and Combined Boundary (IRA)**

**Model Name: NONE**

***The following analysis will answer this request*:**

1. Overlap of treatments on VMap14.
2. Overlap of treatments on Vmap14 and PFAs.

Union the following: Project Boundary, Combined Boundary, Treatments (by Alt), VMap14 and PFA’s

**MIS Species – Includes Flammulated Owl, Hairy Woodpecker, and Pileated Woodpecker, Marten, Goshawk Nesting and Goshawk Foraging. The Fisher Data in MISWildlife10 is not currently in use. Fisher data is in a separate feature class named FisherHabitat**

**Scale of Analysis: Project Boundary and Combined Boundary (IRA)**

**Note:** The initial data may need to be edited to remove MIS habitat if a recent fire has occurred within the Combined Boundary.

**Model Name: MIS Wildlife 10. Output is MISWildlife10. (Need to add Old Growth as Input)**

***The following analysis will answer this request*:**

1. Overlap of treatments on selected species habitat.
2. Overlap of treatments on pileated woodpecker habitat and old growth (if applicable)

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

Union the following: Combined Boundary, Project Boundary, Ownership, Treatments by Alt, MISWildlife10, OldGrowth and FisherHabitat.

**Wolverine**

**Scale of Analysis: Project Boundary and Combined Boundary (Landscape Area) (IRA)**

**Model Name: Wolverine. Output is Wolverine.**

***The following analysis will answer this request*:**

1. Overlap of areas of persistent spring snow (Copeland)
2. Overlap of primary, maternal, male and female dispersal habitat (Inman)
3. Treatment overlap with wolverine habitat based on areas of persistent spring snow (Copeland) and primary, maternal, male and female dispersal habitat (Inman)

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

Union the following: Combined Boundary, Project Boundary, Treatments by Alt, WolverineSnowPersistenceJCopeland2009 and all four InmanR12013 models. (Ownership)

**Lynx**

**Scale of Analysis: Project Boundary and Lynx Analysis Unit (IRA)**

***The following analysis will answer this request*:**

1. Treatment overlap in lynx habitat by LAU, WUI and Ownership.
2. Acres of regeneration harvest by LAU in the past ten years.

**Create an Output.gdb with a WildlifeFx dataset and direct the output of the model to this area.**

Union of the following: Project Boundary, LynxAnalysisUnits, Ownership, TriCountyWUI, Treatments by Alt, LynxHabitatDistrib\_Jan22215 (or newest data) and acres of Regeneration Harvest in the past ten years (Obtained from Geospatial Interface FACTS Activities).

**Model Name: Lynx. Output is Lynx.**

**Grizzly Bear**

**Scale of Analysis: Project Boundary and Elk Herd Unit. The core areas mentioned were created during Divide Travel Planning. Core areas were not created for Blackfoot Travel rather Elk Herd Units were used.**

**Model Name: NONE**

***The following analysis will answer this request*:**

1. Open motorized routes during project implementation and post-implementation for the project and core areas.
2. Total motorized routes during project implementation and post-implementation for the project and core areas.

Union of the following: Divide Project Boundary, Project Boundary, Elk Herd Units, GBear Core Areas, Treatments by Alt, Habitat Type and Inventoried Roadless Areas then Intersected with Travel Routes by Alt

1. Overlap of treatments with habitat types (description and number code).
2. Overlap with treatments within core areas also with habitat types.

Union of the following: Divide Project Boundary, Project Boundary, Elk Herd Units, GBear Core Areas, Treatments by Alt, Habitat Type and Inventoried Roadless Areas

1. Overlap of non-motorized routes with core areas.
2. Overlap of non-motorized routes with elk security areas.

Union of the following: Divide Project Boundary, Project Boundary, Elk Herd Units, GBear Core Areas, Treatments by Alt, Habitat Type and Inventoried Roadless Areas then Intersected with Non-Motorized Routes by Alt

**Forested Patches**

**Scale of Analysis: Project Boundary and Combined Boundary**

**Model Name: NONE**

***The following analysis will answer this request*:**

1. Forested Patches 40% canopy cover and trees greater than and equal to 10” dbh.

Union of the following: Project Boundary, Combined Boundary, a dissolved subset selection of VMap14 (to capture 40%CC and 10”dbh) and IRA.

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