

Lab 6: Vector Analysis

Analysis Problem

You are now working for a lumber company in the Tongass National Forest in southeastern Alaska. Your job is to calculate timber values of the potential lease areas. You need to first determine which stand of forest is harvestable based upon their monetary value. From this information, select one stand to evaluate for harvestable area. Specific criteria that you need to take into consideration are:

- No trees may be cut within 800 meters of a goshawk nest.
- No trees can be cut within 50 meters of a stream.
- Also, no trees can be cut within 100 meters of a stream where salmon spawn.

Once you determine the areas within the stand that are actually harvestable you will need to update the information in your attribute table.

IMPORTANT NOTE: Be sure to pay attention to the names you give new feature classes. Be sure you pay attention to where you are saving these new feature classes. The default is not always what you might think it is....

Part 1: You have a polygon layer of forest stands from the Forest Service. Attributes include the estimated value of each stand (in dollars) and the lease area to which each stand belongs.

Task 1: Classify your stands by lease using unique color.

Task 2: Determine the Stand Value in millions.
Multiply ValuePerMeter by Shape_Area.
Your output will be the dollar value of each stand.

Task 3: Dissolve stands based upon Lease_ID AND summarize StandValue by Sum.

(Data Management Tools => Generalization => Dissolve)

Be sure to give everything meaningful names and save in your geodatabase.

- What is Count_LeaseID?*
- What is Sum_StandValue?*

IF you don't have these fields in your new table, try again.

Part 2: From this examination of the value of each stand, it appears that Lease F is the stand to harvest.

Task 1: Create a layer of only Lease F.

Task 2: Clip the streams to the boundary of Lease F.

Task 3: Select goshawk nests and export the selected features.
(We haven't done this before, so I will give you some hints.)

- **First** select by locations for all nests in Lease F.
- This is new and is another way to create feature classes:
 - Right click on *Goshawks Nest layer*.
 - Select **Data/Export Data**

Use the same coordinate system.

-Navigate to where you want to save this, save it as a feature class or shapefile and give it a meaningful name.

Add to your map.

Part 3: Determine where logging is prohibited.

Criteria: *No trees may be cut within 800 meters of a goshawk nest.*

No trees can be cut within 50 meters of a stream.

Also, no trees can be cut within 100 meters of a stream where salmon spawn.

Task 1: Buffer goshawk nests.

Be sure DO NOT dissolve barriers between buffers and save as a new layer.

What attributes are in this table?

Task 2: Buffer streams based on an attribute.

Open the attribute table for Steams in Lease F.

Some of these streams do have salmon spawning areas. Remember the criteria.

In this instance, DO NOT dissolve barriers between buffers.

Zoom in to evaluate your new layer.

Be sure you have a BufferDist field in your new table.

IF you don't, try again.

Task 3: Union nest and stream buffer layers.

Examine your new table – what happened to BufferDist?

Task 4: Union NestandStream with **Stand F**.

The input layer should be NestandStream.

How many records are in your new table?

Examine the data in the table. *What does it mean?*

HINT: Features with 0 for both BufferDist attributes are in harvestable areas. Your new output will be a very confusing map – it is the table that is of most interest.

Part 4: Calculate the value of harvestable area for Stand F.

Task 1: Create a definition query to display only harvestable areas.

HINTS: Right click on your AllLayers layer (or whatever you have called this final map).

Select Properties/Definition Query. Click on the Query Builder.

Create a query to select the features in both BufferDist fields that are equal to 0.

HINT: Be sure to turn off other layers so that they will not confuse you.

Task 2: Update the attribute table for the StandValue.

HINTS: You are going to update the field for StandValue – so you can either add a new field or replace the values in the existing field.

You did this in Part 1.

Examine your new values – why are some of them the same and some different?

Task 3: Compare the value of Lease F with your original harvest value.

Task 4: Determine other factors that should be included in determining harvesting locations in Lease F.

TURN IN: *(after one week)*

- A flowchart of the procedure you will follow. This flow chart should clearly identify the data preparation or processing part from the analysis part.
 - **HINT:** Read the entire exercise first, then create your flowchart.
- A paragraph that identifies the stand you have selected, comparison of the original value of the stand and the recalculated value of the stand, and other attributes that should be considered before going forward with logging – what other considerations have been left out?
- A layout of the selected harvestable area with streams and goshawk nest, their buffer zones clearly delineated.