

# Exercise 2: Geodatabase Attribute Domains



## Introduction to Exercise 2

In this exercise, you will utilize the File Geodatabase created during Exercise 1. You will import existing data into the geodatabase, create attribute domains, and edit table-attribute values that link to those domains.

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## Upon completion of this exercise, you will be familiar with:

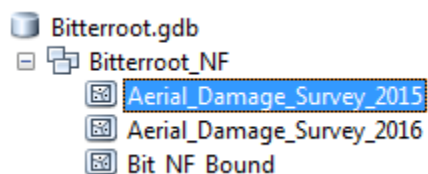
- Creating attribute domains
- Assigning attribute domains to a feature class
- Editing Attributes with Coded Value Domains
- Editing Attributes with Range Value Domains
- Using the Validate Features command
- Exporting schemas
- Importing schemas
- Checking the Validity of the Imported XML Data

## Part 1: Examine the Data

*As a part of the Forest Service's Aerial Damage Survey (ADS) project, Bitterroot National Forest will update its 2015 and 2016 data captures. Our goal for this exercise is to create attribute domains associated with the features in this dataset to ensure all attribute edits are timely and accurate.*

### A. Start ArcCatalog.

1. Open ArcCatalog.
2. From the Catalog Tree, navigate to... \data\Bitterroot.gdb\Bitterroot\_NF.



### B. Examine the attribute data of the Aerial\_Damage\_Survey\_2015 feature class.

1. Activate the Preview tab, and then navigate in the Catalog Tree to the Bitterroot\_NF feature dataset's Aerial\_Damage\_Survey\_2015 feature class.
2. Preview the table for the Feature Class. Hint: Look for the Preview dropdown near the bottom.



Contents Preview Description									
	Year	dmg_type	severity	no_trees	host	for_type	pattern	Shape_Length	Shape_Area
	2015	8	2	100	108	2108	-1	3607.076311	524323.696096
	2015	8	2	30	122	2122	-1	2507.832662	392208.130085
	2015	8	2	76	108	2108	-1	4837.987642	1056312.880387
	2015	8	2	50	108	2108	-1	2516.977236	358951.296131
	2015	6	2	0	10	3010	-1	2030.469457	167389.209489
	2015	6	2	0	10	3010	-1	2037.682092	229934.644338
▶	2015	8	2	99	108	2108	-1	5026.403483	979898.502556

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Preview: Table

**QUESTION: How many records are there?**

To gain a better understanding of our data, the table below further explains the attributes of the Aerial Damage Survey feature class. We will create attribute domains for the fields outlined below.

OBJECTID *	Shape *	Year	dmg_type	severity	no_trees	host	for_type	pattern
------------	---------	------	----------	----------	----------	------	----------	---------

Attribute	Definition (description)
year	Year the survey was flown
dmg_type	Damage type identification codes
severity	Defoliation severity codes
no_trees	Number of dead trees detected - measure of mortality
host	Host tree species code
for_type	Forest Type Code
pattern	Defoliation pattern codes

Attribute domains are rules that describe the legal values of a field type, and provide a method for enforcing data integrity. A domain is a declaration of acceptable attribute values. Whenever a domain is associated with an attribute field, only the values within that domain are valid for the field. In other words, the field will not accept a value that is not in that domain. Using domains helps ensure data integrity by limiting the choice of values for a particular field. Attribute domains can be shared across feature classes, tables, and subtypes as long as they exist in the same geodatabase.

For this exercise, we will create attribute domains providing codes and descriptions of trees in the Bitterroot National Forest based on the Forest Service's Aerial Damage Survey project. These domains include damage type identification, defoliation severity and defoliation patterns. **PLEASE NOTE: ALL DATA FOR THIS COURSE HAS BEEN MODIFIED FROM THE ORIGINAL AND SHOULD NOT BE USED OUTSIDE OF THIS COURSE.**

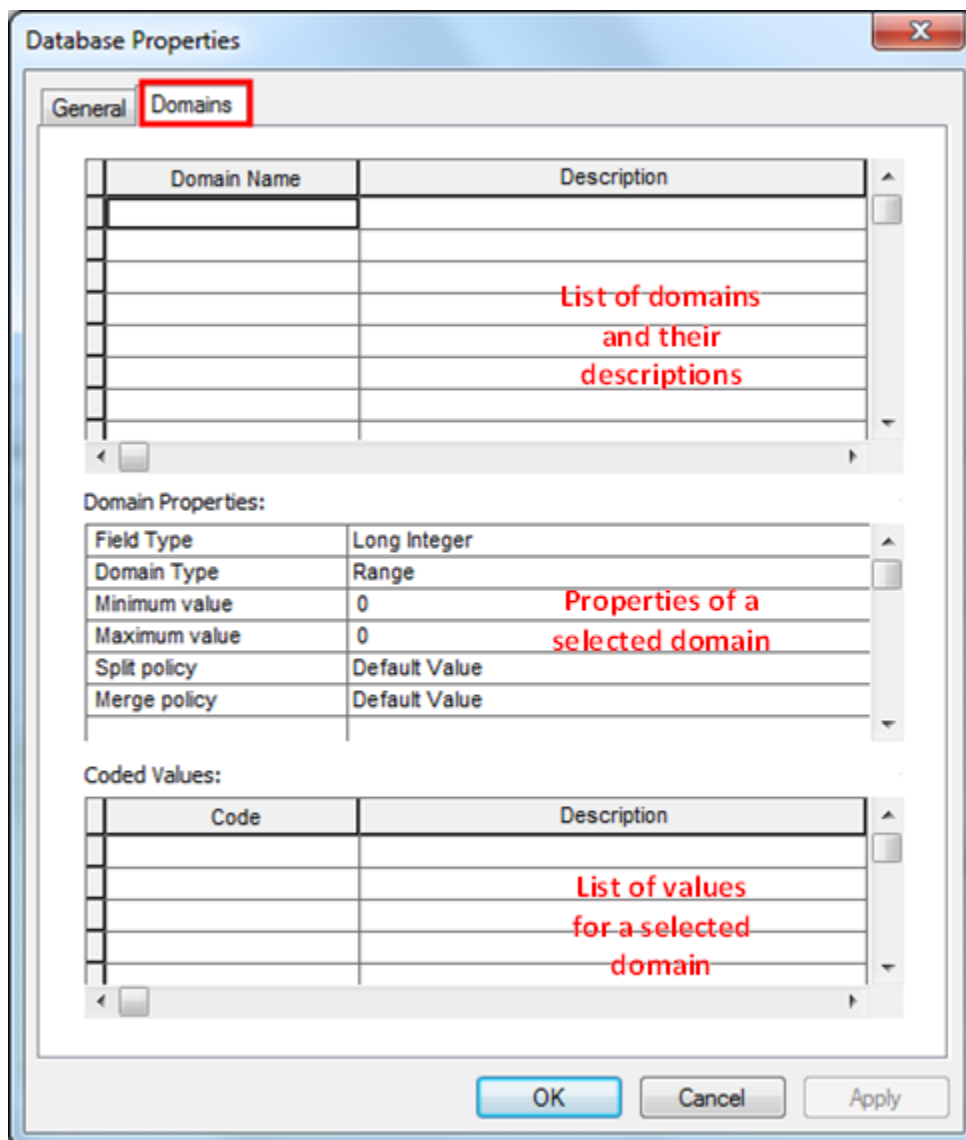


## Part 2: Creating Attribute Domains

Attribute domains are managed using the Domains property page, which is displayed as part of the geodatabase's properties or from the Feature Class or Table Properties dialog box.

### A. Create an Attribute Domain that describes varying forest damage types.

1. From ArcCatalog, open the **Properties** for the ...\\data\\**Bitterroot.gdb** file geodatabase. *Hint: Right-click the geodatabase and select Properties.*
2. Activate the **Domains** tab.



**Database Properties**

General **Domains**

Domain Name	Description

List of domains  
and their  
descriptions

Domain Properties:

Field Type	Long Integer
Domain Type	Range
Minimum value	0
Maximum value	0
Split policy	Default Value
Merge policy	Default Value

Properties of a  
selected domain

Coded Values:

Code	Description

List of values  
for a selected  
domain

OK Cancel Apply

An attribute domain is a list of values (LOV) stored in a geodatabase. These values can be coded descriptions or a numeric range. As the name implies, attribute domains relate to user-defined attributes. When editing an attribute linked to an attribute domain, the user can only select from the LOV, thus enforcing data integrity.

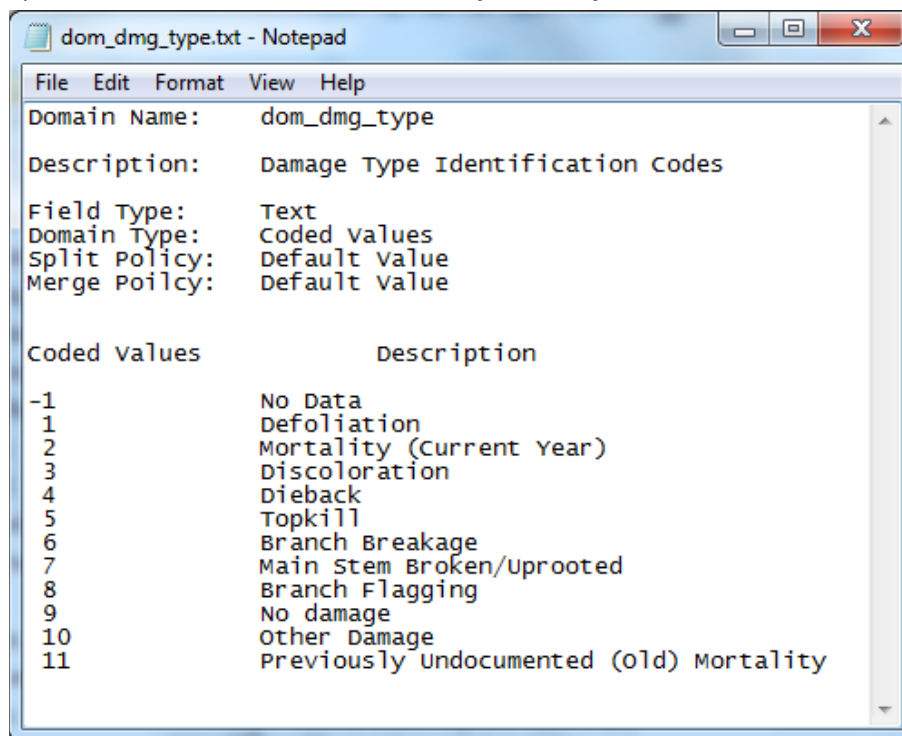
There are several parameters required when creating domains: a name, a description/purpose for the domain, the field type of the attribute field you want the domain to be associated, the type of domain (range or coded), split and merge policies and coded values.

3. Click the **Cancel** button to close the *Database Properties*.

Depending upon the size of the attribute domain, entering coded values can be a tedious process. However, if the codes and their descriptions are already on file or on the Internet, you can copy and paste information straight into the *Database Properties* window.

A text file of the damage codes and their descriptions already exists in your training workspace, within the ... \data folder.

4. In Windows Explorer, navigate to ... \data \dom\_dmg\_type.txt. Double-click to open the file. Notepad should launch, with the contents of the text file loaded.



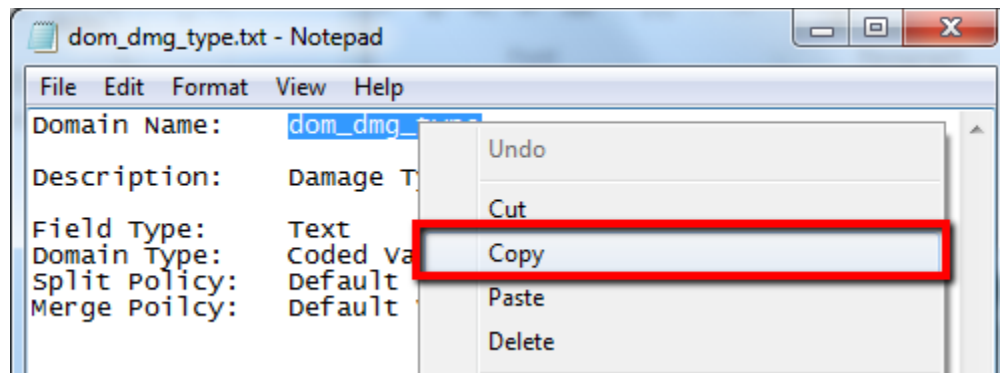
The text file lists the properties of the “dom\_dmg\_type” attribute domain, which contains twelve coded values (-1 thru 11) for varying forest damage types.

5. Re-open the Database Properties for Bitterroot.gdb.
6. Reposition the *Properties* and *Notepad* windows so you can see both.

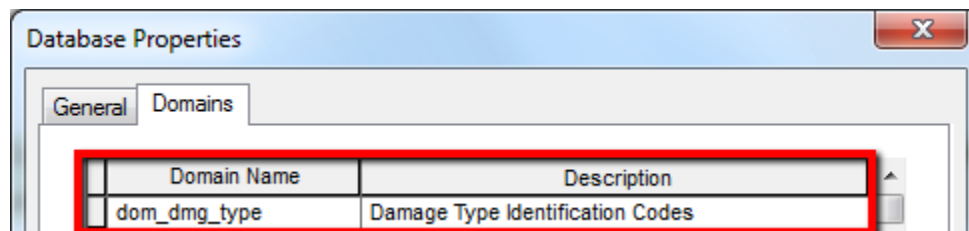


- From Notepad, copy the **dom\_dmg\_type** domain name.

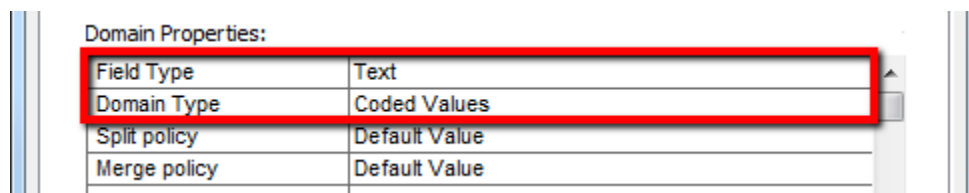
**TIP:** To copy from Notepad, you can right click and select **Copy**; or press <Ctrl> C on your computer's keyboard.



- From the **Database Properties** window, single click in the first **Domain Name** cell, and press <Ctrl>+V. Note: Right-clicking the cell will not work.
- For the Description, copy and paste "Damage Type Identification Codes" from Notepad.



- Under Domain Properties, change the *Field Type* to **Text** and ensure *Domain Type* is set to **Coded Values**.



- For the remaining Domain Properties leave the default settings.

**What are Split and Merge Policies?** When editing data and a single feature is split into two features or two separate features are merged into a single feature what happens to the attributes? While the results of these types of edit operations on the feature's geometry are easily predictable, their effects on the attribute values are not. The behavior of an attribute's values when a feature is split is controlled by its split policy. When two features are merged, an attribute's value is controlled by its merge policy. When a feature is split or merged, the geodatabase looks to these policies to determine what values the resulting feature or features have for a particular attribute.

12. On your own, copy and paste the twelve **coded values and their descriptions** used for the Damage Type Identification Codes.

Coded Values:

Code	Description
8	Branch Flagging
9	No damage
10	Other Damage
11	Previously Undocumented (Old) Mortality

13. Click **Apply**.  
14. Close Notepad.

**IMPORTANT:** If you do not click **APPLY** before moving on to the next step, your Domain Properties and Coded Values will not be saved.

15. On your own, add another domain called **dom\_severity**. Use the following outline and screenshot for guidance.

- Domain Name: **dom\_severity**
- Description: **Defoliation Severity Codes**
- Field Type: **Text**
- Domain Type: **Coded Values**
- Coded Values:

- Code    Description
- -1        No Data
- 1         Low (Equal to or Less than 50 % defoliation)
- 2         High (More than 50 % defoliation)

Coded Values:

Code	Description
-1	No Data
1	Low (Equal to or Less than 50 % defoliation)
2	High (More than 50 % defoliation)

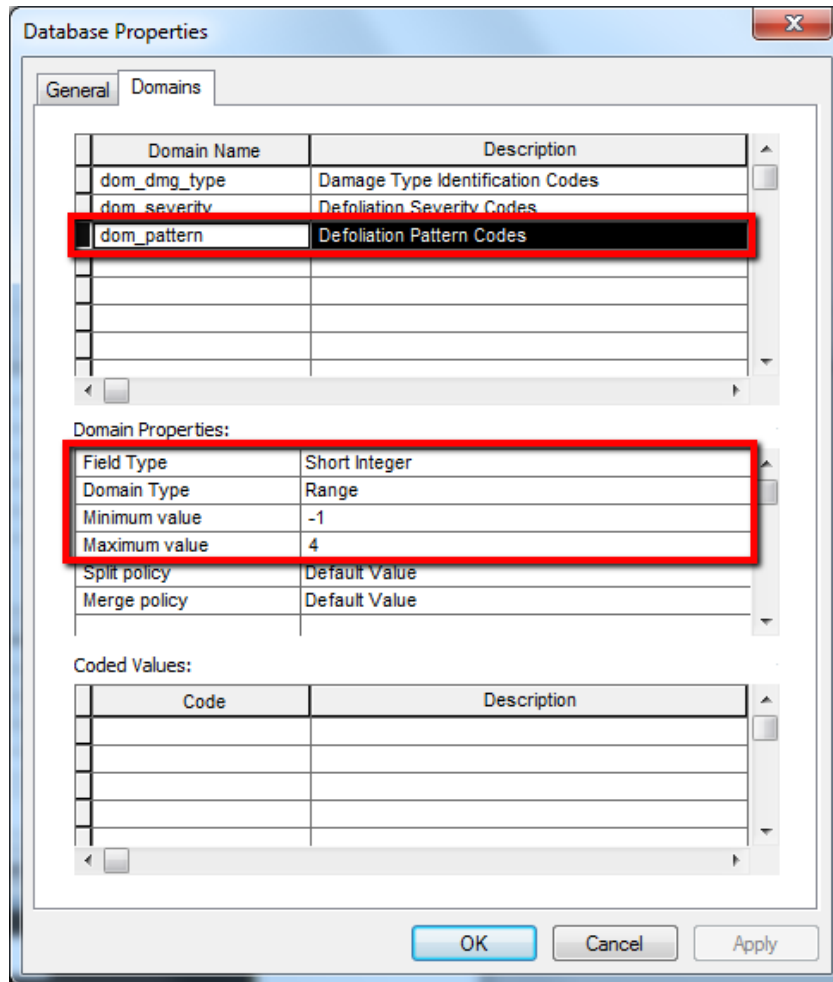
16. Remember to click **APPLY** when you are done.

Our final attribute domain will use a range of numbers. A range domain specifies a valid range of values for a numeric attribute. When creating a range domain, you enter a minimum and maximum valid value. Range domains can be applied to short-integer, long-integer, float, double, and date attribute types. In the following range domain, **dom\_pattern**, the values will range from negative one to four.

17. On your own, **complete the properties for the Pattern domain**. Use the following outline and screenshot for guidance. Remember to click **APPLY** when you are done.

- Domain Name: **dom\_pattern**
- Description: **Defoliation Pattern Codes**

- **Field Type: Short Integer**
- **Domain Type: Range**
- **Minimum Value: -1**
- **Maximum Value: 4**



Domain Name	Description
dom_dmg_type	Damage Type Identification Codes
dom_severity	Defoliation Severity Codes
dom_pattern	Defoliation Pattern Codes

Domain Properties:	
Field Type	Short Integer
Domain Type	Range
Minimum value	-1
Maximum value	4
Split policy	Default Value
Merge policy	Default Value

Coded Values:	
Code	Description

**NOTE:** When creating a RANGE domain, codes and code descriptions are NOT required.

18. Click **Apply** and **OK** to close the Database Properties window.

## Part 3: Assign Attribute Domains to a Feature Class

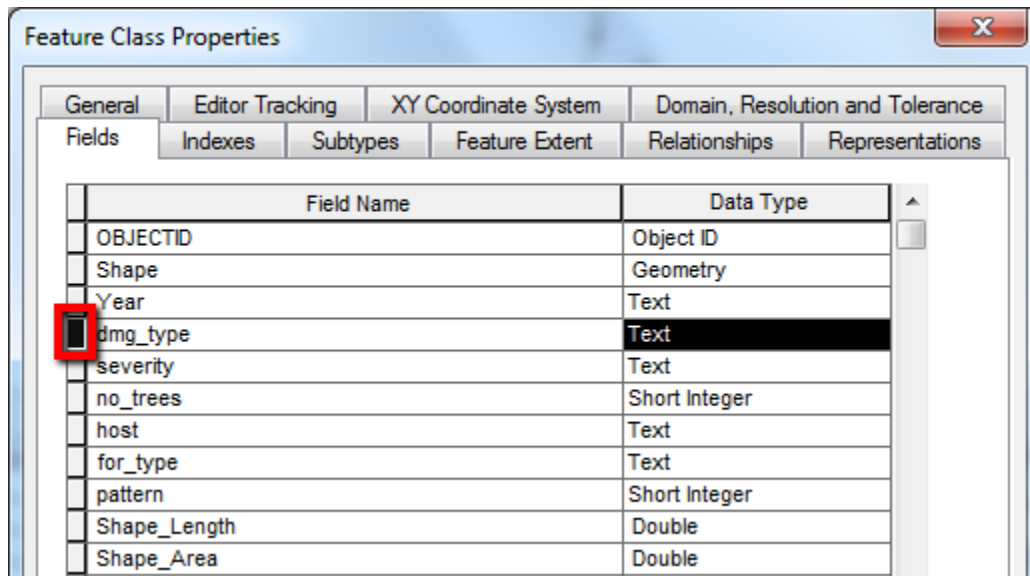
To ensure editing accuracy we will link fields to attribute domains. Attribute domain assignment is done through the field properties of each feature class.

### A. Apply a coded domain to the damage type (dmg\_type) field.

1. In the Catalog Tree, double click **Aerial\_Damage\_Survey\_2015** to open the layers Properties. (You can also right click the file, and select Properties from the context menu).

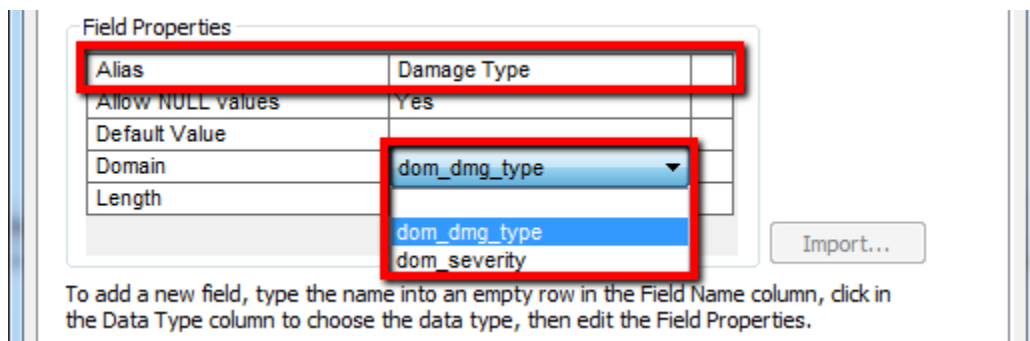


2. Click the **Fields** tab.
3. Click the **gray box** to the left of **dmg\_type** to select the row.



**QUESTION: What is the Data Type for the dmg\_type field?** \_\_\_\_\_

4. Under field properties, update the *Alias* to **Damage Type**.
5. Click the box adjacent to *Domain*. A drop-down list of two domains for the geodatabase displays that you had created earlier.
6. Select dom\_dmg\_type.



**NOTE: Only one attribute domain can be assigned to a field.**

7. Click **Apply**.

**Why do only two domains show up when we created three?** A fields data types determines what domains are available for that field. In other words, a domain and the field it is applied must have the same data type. Only "Coded Value" domains are available for dmg\_type2 because it is a text field.

8. On your own, set the following field properties:

i. For the **severity** field

- *Alias* = Damage Severity
- *Domain* = dom\_severity

Field Properties	
Alias	Damage Severity
Allow NULL values	Yes
Default Value	
Domain	dom_severity
Length	50

ii. For the **pattern** field

- *Alias* = Defoliation Patterns
- *Default Value* = -1
- *Domain* = dom\_pattern

Field Properties	
Alias	Defoliation Patterns
Allow NULL values	Yes
Default Value	-1
Domain	dom_pattern

*FYI: By setting the Default Value, all cells will initially be populated with that value (e.g., 0).*

9. When you are finished, click **Apply** and **OK**.

## B. Confirm the changes by previewing the table of the **Aerial\_Damage\_Survey\_2015** feature class.

1. From the Catalog Tree, highlight **Aerial\_Damage\_Survey\_2015**, select the **Preview** tab, and change the Preview dropdown to **Table**.
2. Resize the **dmg\_type** and **severity** fields if needed/desired.

Contents		Preview	Description				
	dmg_type	severity	no_trees	host	for_type	pattern	
►	Branch Flagging	High (More than 50 % defoliation)	150	108	2108	-1	
	Branch Flagging	High (More than 50 % defoliation)	100	108	2108	-1	
	Branch Flagging	High (More than 50 % defoliation)	30	122	2122	-1	
	Branch Flagging	High (More than 50 % defoliation)	76	108	2108	-1	
	Branch Flagging	High (More than 50 % defoliation)	50	108	2108	-1	
	Branch Breakage	High (More than 50 % defoliation)	0	10	3010	-1	
	Branch Breakage	High (More than 50 % defoliation)	0	10	3010	-1	
	Branch Flagging	High (More than 50 % defoliation)	99	108	2108	-1	
	Branch Flagging	High (More than 50 % defoliation)	47	108	2108	-1	
	Branch Flagging	High (More than 50 % defoliation)	49	108	2108	-1	
	Branch Breakage	High (More than 50 % defoliation)	0	10	3010	0	

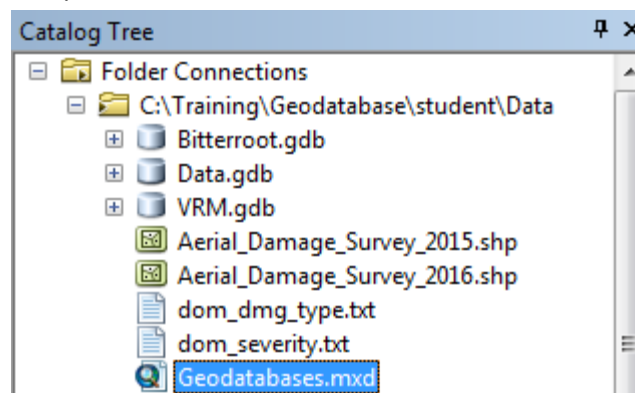
**NOTICE:** Instead of listing codes, the field contains the descriptions we created for the “Damage Type and Severity” attribute domains. **Why aren’t the field aliases displaying?** ArcCatalog does not display aliases; however, they will appear in ArcMap.

## Part 4: Editing Attributes with Coded Value Domains

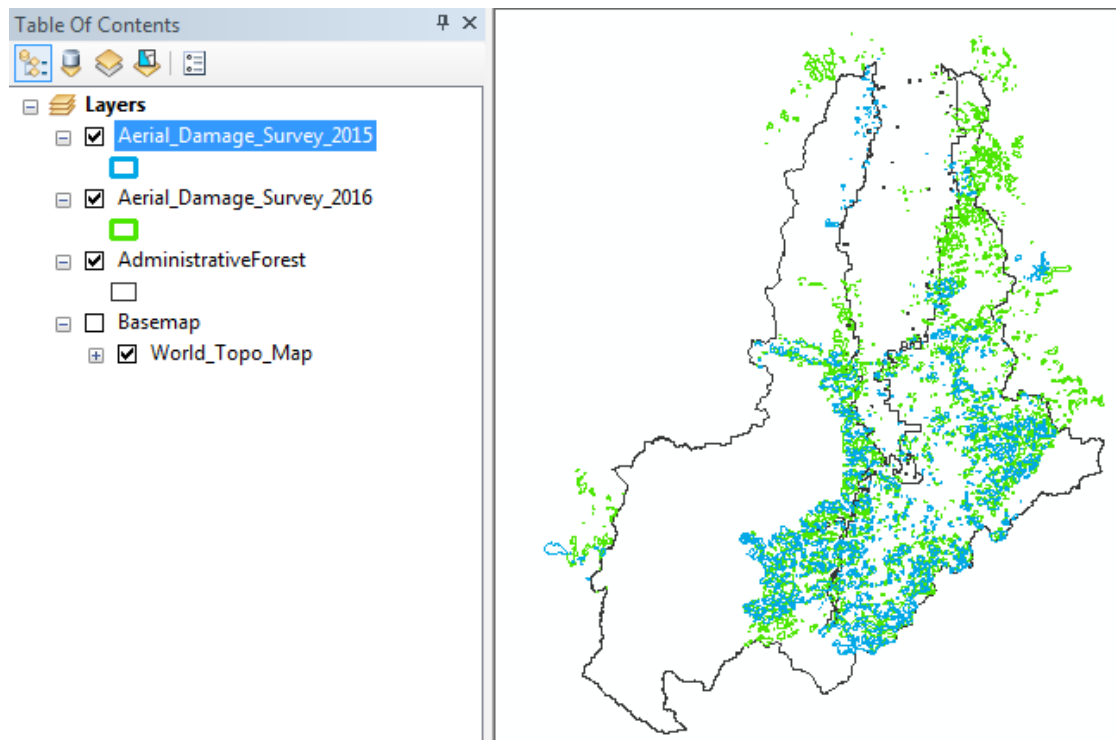
After creating and linking the attribute domains, explore how the table attributes behave when you edit their values from ArcMap.

### A. Open the Geodatabases.mxd.

1. From the Catalog Tree, navigate to the ...\**Data** folder.
2. From the Contents pane, double-click **Geodatabases.mxd**.

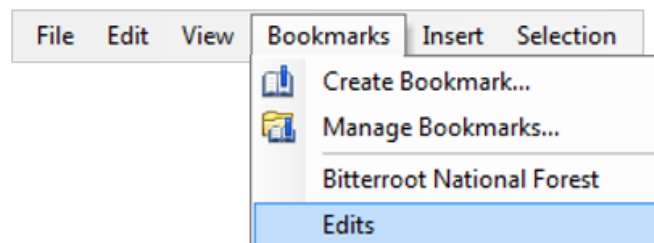


3. ArcMap opens displaying the data view of the Geodatabases map document.



## B. Change the Data Frame's View using Bookmarks.

1. From the **Bookmarks** menu choose, **Edits**.



2. The Data View zooms to the spatial bookmark.


*These damage survey polygons are missing codes for Damage Type, Damage Severity and Defoliation Patterns. In this step, we will update these features with the correct values. The coded value domains will provide drop-down lists in the Attributes window to ensure you are assigning the field a valid value.*

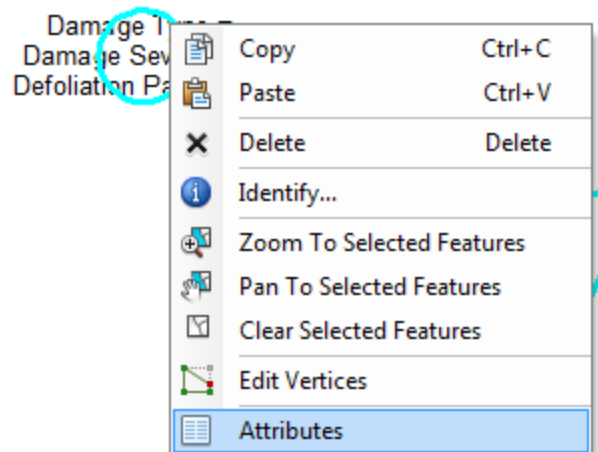
## C. Start an Edit session to edit the Aerial\_Damage\_Survey\_2015 layer.

1. From ArcMap's *Table of Contents*, right click **Aerial\_Damage\_Survey\_2015** | select **Edit Features** | **Start Editing**.
2. The Editor Toolbar appears.



## D. Select and update the Damage Type for the visible Damage Survey Polygons by performing a GLOBAL edit.

1. From the Editor Toolbar, activate the **Edit tool**. 
2. Select the **2 Damage Survey** polygons. Tip: Hold the SHIFT key while making a selection.
3. If it is not already open, activate the **Attributes** window. (Hint: Right-click within the selected features) Activating the Attributes button from the Editing toolbar will also open the Attributes window.

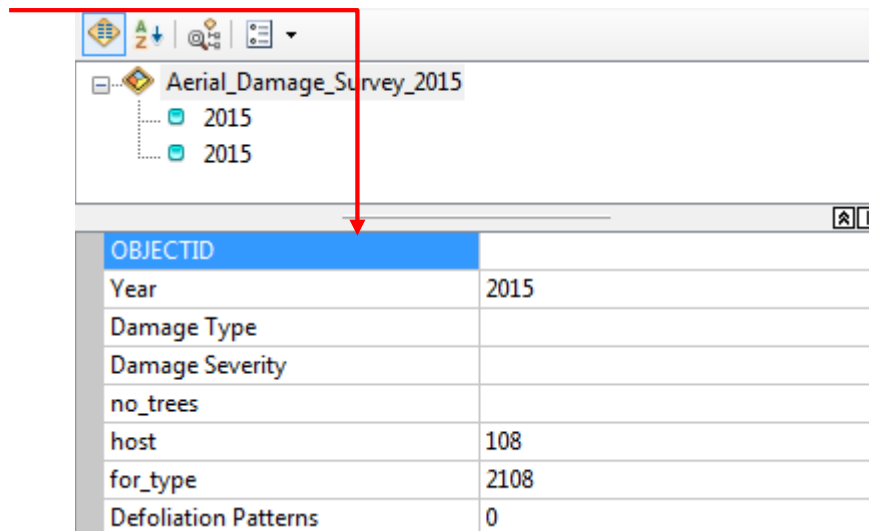


**NOTE:** The Attributes window displays attributes of “selected” features and allows you to edit the values. The top panel of the window shows the layer to which the selected feature or features belong, while the bottom panel shows the attribute values of that feature—including any related or joined information.

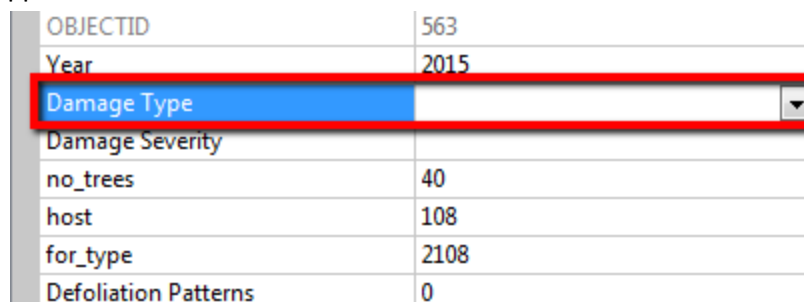
4. If needed, expand the **Basemap** layer in the **TOC** and **check the box** to have it draw in the background.

*In the Attributes window, two “2015 Aerial Damage Survey” records are listed. Both records need their **Damage Type** attributes changed to “**Defoliation**.” We can edit each record independently, or, since the attribute changes are the same for both records, we can save time and edit both records simultaneously. To edit multiple records, we need to highlight the layer’s name (i.e. Aerial Damage Survey 2015).*

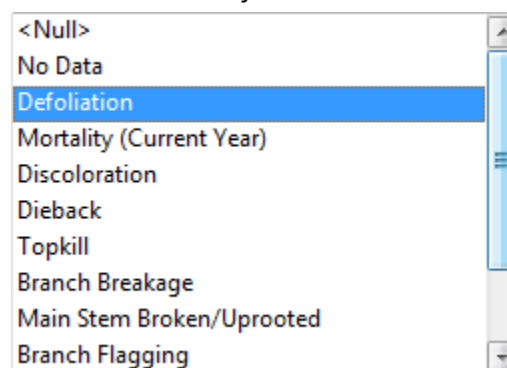
5. In the top panel of the Attributes window, **highlight** the layer name **Aerial\_Damage\_Survey\_2015**.
6. As needed, **resize** the **Property column** of the lower panel to read all the field names.



7. From the lower pane, select **Damage Type**. After you select the field name, a dropdown arrow appears at the end of the row.



8. Click the dropdown arrow adjacent to Damage Type and select “**Defoliation**” from the list of values. *The list of suitable values comes from the attribute domain you created.*

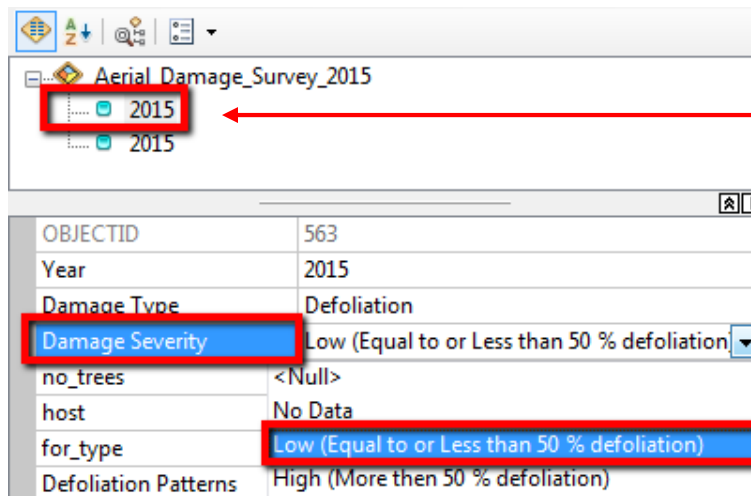


*You can verify your edits by toggling the selection of each feature from the top panel of the Attributes window. The next set of edits requires editing each feature separately as their values are different.*

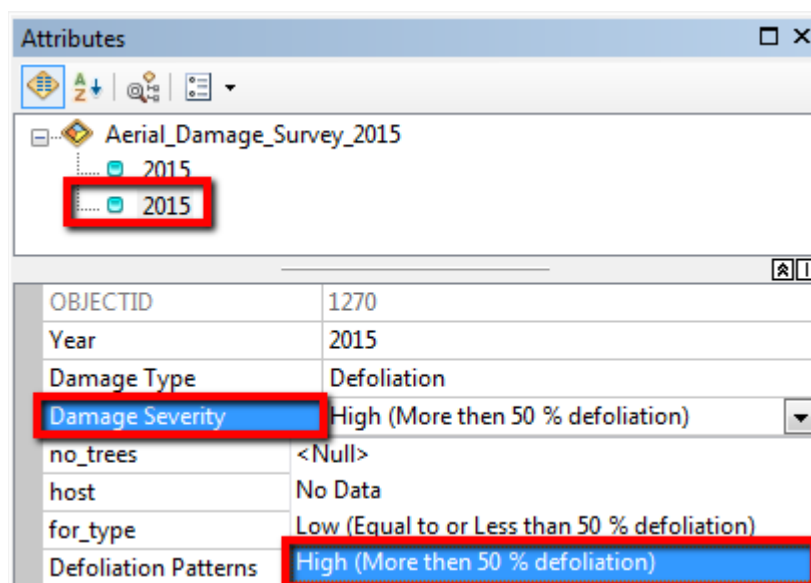
## E. Update the Damage Severity attributes for the selected Damage Survey Polygons.



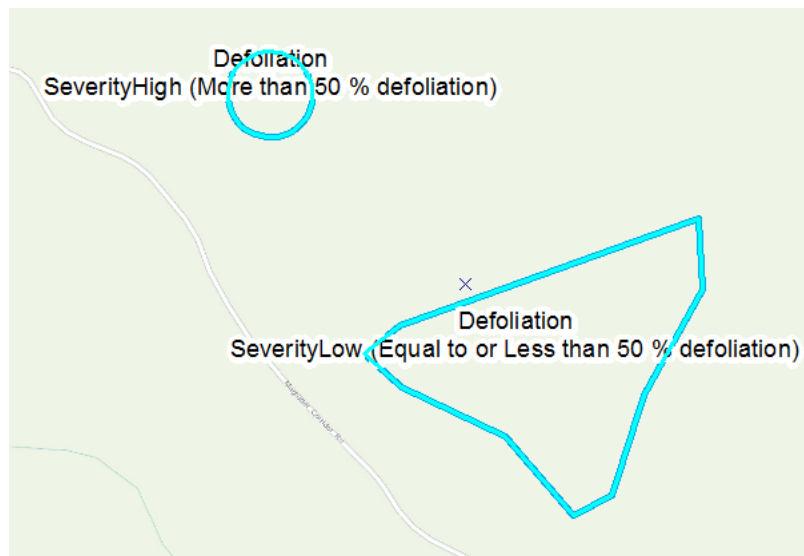
1. If it is not already open, activate the Attributes window.
2. Select the first feature listed in the top panel of the Attribute Window.
3. From the lower pane, select **Damage Severity**. After you select the field name, a dropdown arrow appears at the end of the row.
4. Click the dropdown arrow adjacent to *Damage Severity* and select “**Low (Equal to or Less than 50% defoliation)**” from the list of values.



5. Select the second feature listed in the top panel of the Attribute Window.
6. From the lower pane, select **Damage Severity**. Again, after you select the field name, a dropdown arrow appears at the end of the row.
7. Click the dropdown arrow adjacent to *Damage Severity* and select “**High (More than 50% defoliation)**” from the list of values.

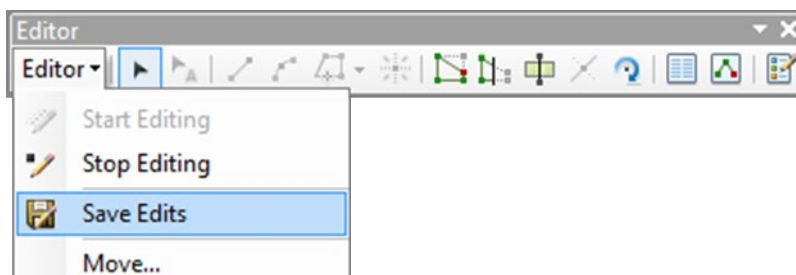


8. Highlight each record, and confirm your changes. You can also verify the changes in the labels from the Data View.



## F. Save your edits.

1. From the Editing toolbar, select **Editor | Save Edits**.



## Part 5: Editing Attributes with Range Value Domains

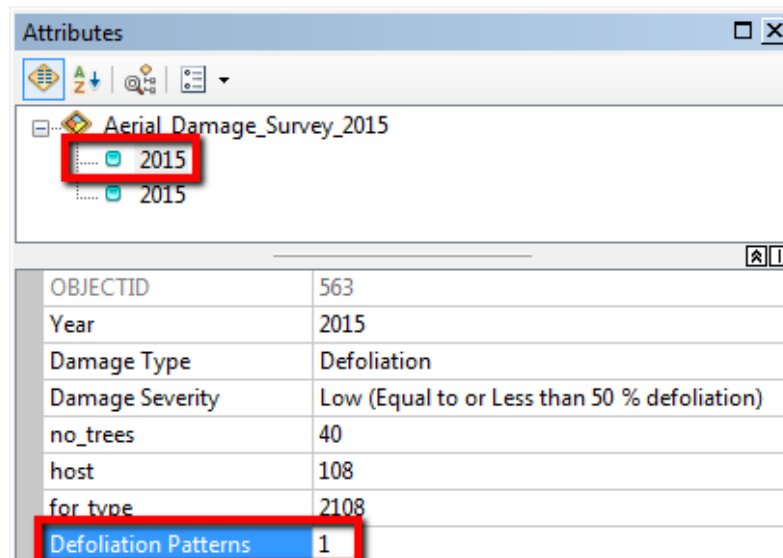
Damage Pattern Codes & Descriptions	
-1	No Data
1	Host type or species is > 50 % and the damage is contiguous (relatively continuous)
2	Host type or species is > 50 % and damage is patch (concentrated in discrete pockets or individual trees)
3	Host type or species < 50 % and damage is continuous
4	Host type or species < 50 % and damage is scattered

### A. Update attributes for the Defoliation Patterns field on the selected Damage Survey Polygons.

1. Select the *first* feature from the top panel of the Attribute window.
2. From the lower pane, select **Defoliation Patterns**.

*Although Defoliation Patterns is linked to an attribute-range domain (-1 thru 4), you won't see a drop-down list of numbers. The value must be entered manually.*

1. Enter the number **1**.



OBJECTID	563
Year	2015
Damage Type	Defoliation
Damage Severity	Low (Equal to or Less than 50 % defoliation)
no_trees	40
host	108
for type	2108
<b>Defoliation Patterns</b>	<b>1</b>

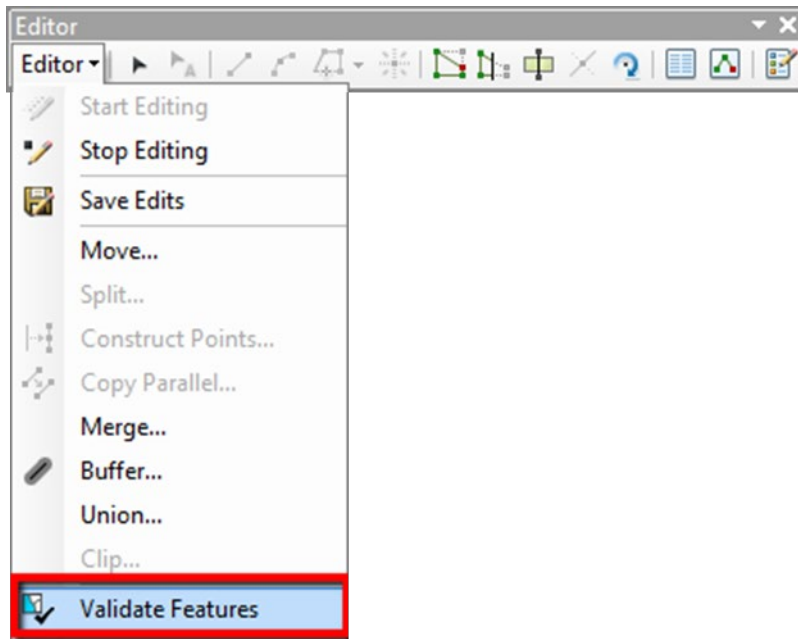
2. Select the *second* feature listed in the top panel of the Attribute window, and enter the number **30** for **Defoliation Patterns**.

**CAUTION:** *Technically, you can enter any number you want (e.g., 30), and the edit is accepted. However, when you use the Validate Features command, you will receive a message that the number is out of the field's specified range.*

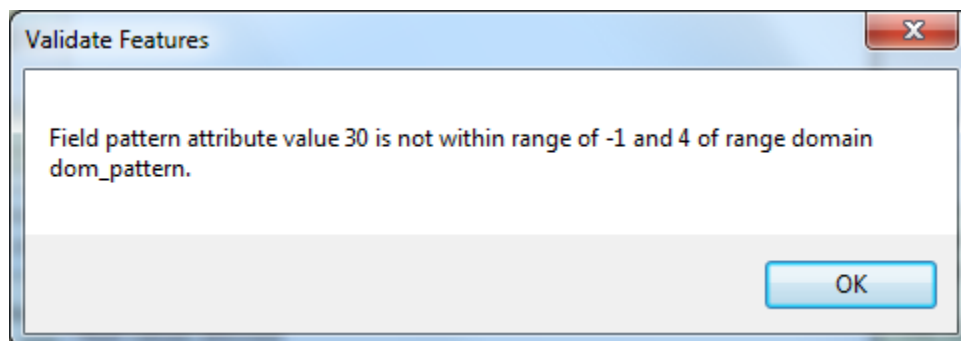
3. **Save** your edits. (Do not stop editing).

*Before we stop editing, we will validate the features to verify that the feature's domain values match values stored within the geodatabase feature class.*

4. From the *Editor* menu, choose **Validate Features**.



5. Read the *Validate Features* message, and then click **OK** to close the dialog. Only the feature found in error remains selected.



**QUESTION:** What is the range of valid values for the Defoliation Patterns field? Hint: Look at the information at the bottom of the Attributes window? \_\_\_\_\_

**QUESTION:** Does the value you entered fall within the valid values for the range domain? \_\_\_\_\_

**Defoliation Patterns**  
Short Integer  
Range domain: dom\_pattern (-1 - 4)  
Null values allowed

6. Select the remaining feature listed in the top panel of the Attribute window, and enter the number **3** for **Defoliation Patterns**.

7. Again, save your edits but do not stop editing.
8. From the *Editor* menu, choose **Validate Features**. This time ALL features are valid. Click **OK** to close the Validate Features notification.

*Is it possible to validate existing feature attribute data?*

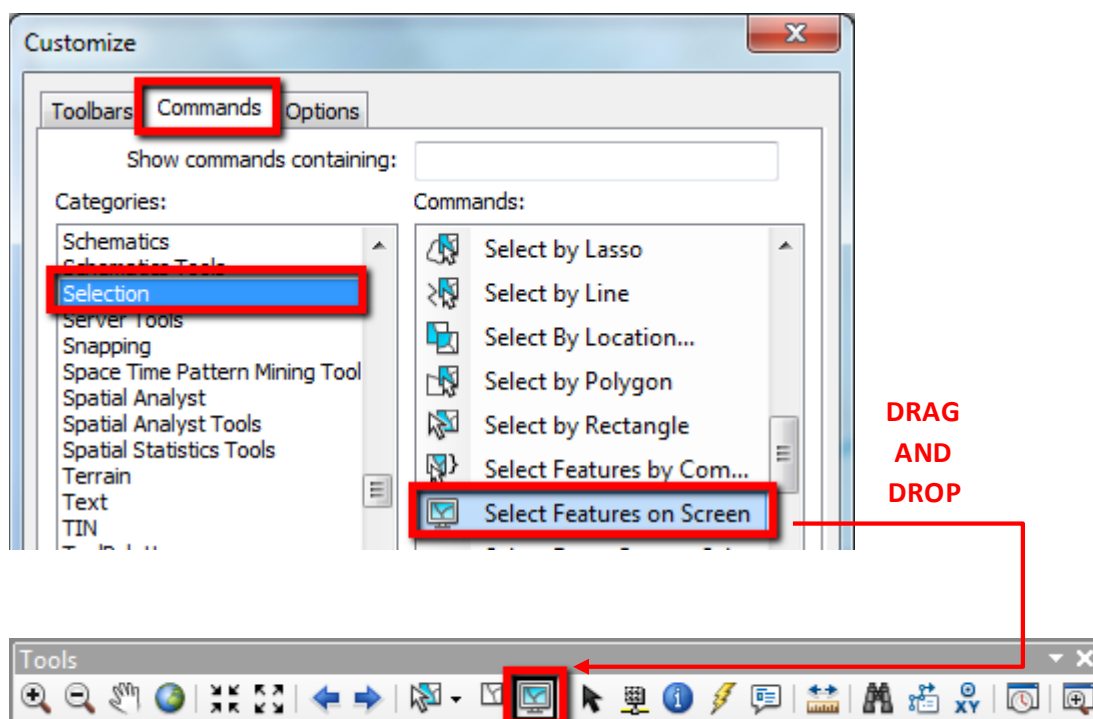
*The answer is **YES**. The Validate Features command allows you to verify that ALL selected attributes adhere to attribute domains.*

## Part 6: Employ the Validate Features Command

*For this step, we will customize the tools toolbar by adding the Select Features on Screen command. We will then validate the selected features of the Aerial Damaged Survey feature class.*

### A. Add the Select Features on Screen command to the Tools Toolbar.

1. Double-click in the gray area where the toolbars are docked. *The Customize dialog appears.*
2. **Activate** the **Commands** tab in the Customize window.
3. Highlight **'Selection'** in the Categories list and locate the **'Select Features on Screen'** button under the commands list.
4. With the **'Select Features on Screen'** button highlighted, drag the selection onto your **Tools** toolbar.



5. The Select Features on Screen command is now ready to use. Close the **Customize** window.

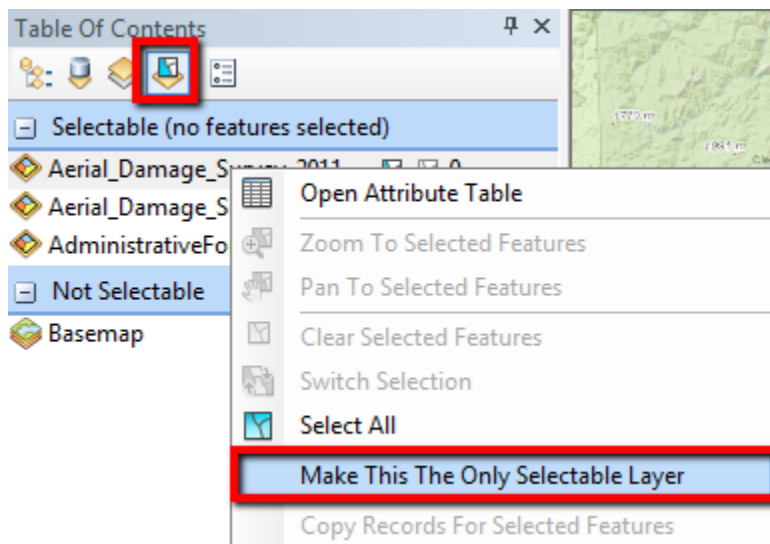
### What you should know about the Validate Features command:

- Only geodatabase feature classes can be validated.
- The tool is disabled if no features are selected. When validation is complete, only invalid features remain selected.
- The tool does not validate topology or any type of spatial edit.
- Features flagged as invalid should have their attributes inspected on a case by case basis. Some values may be exceptions to the validation rules.

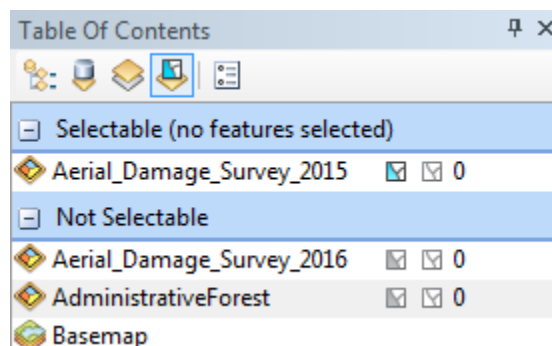
*For more information, please refer to ArcGIS's Desktop Help.*

### B. Make Aerial\_Damage\_Survey\_2015 the only selectable layer.

1. From ArcMap's Table of Contents, click the **List by Selection** button.
2. Right-click Aerial\_Damage\_Survey\_2015 and select Make This The Only Selectable Layer.



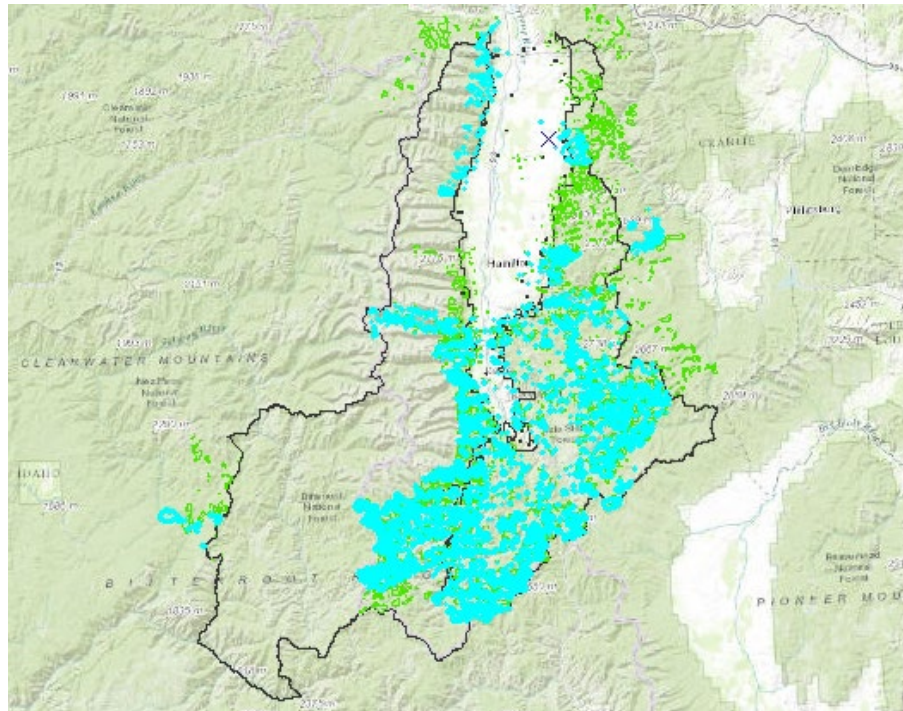
3. Aerial\_Damage\_Survey\_2015 is now the only layer listed as Selectable.





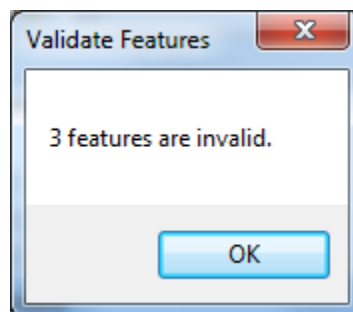
### C. Select all Features from the Full Extent of the Data View.

1. From ArcMap's Tools Toolbar, Click the **Full Extent Button**.
2. Click the newly added "**Select Features on Screen**" button.
3. All selectable features visible at the Data View's current map scale are selected. Remember, we made Aerial\_Damage\_Survey\_2015 the only selectable layer.



### D. Validate the selected Features.

1. From the **Editor** menu, on the Editor Toolbar, select **Validate Features**. The Validate Features dialog indicates several invalid features. Let's see what attribute values we need to fix.



### E. Review and correct the attributes of the invalid features.

1. Open the **Attribute Table** for the Aerial\_Damage\_Survey\_2015 layer. Hint: From the Table of Contents, right-click **Aerial\_Damage\_Survey\_2015** | select **Open Attribute Table**.

2. Display only the selected features. Hint: Click the **Show Selected Records** button from the bottom of the attribute table.

Year	Damage Type	Damage Severity	no_trees	host	for_type	Defoliation Patterns
2015			30	108	2108	12
2015			30	108	2108	12
2015			50	108	2108	12

The *Validate Feature* command has flagged these records because their **Damage Type** and **Damage Severity** fields have no values and because their **Defoliation Patterns** have unacceptable values extending beyond what is allowable for that field; the range domain assigned to this field only accepts values between -1 and 4. We will update these attributes to **No Data** (-1).

Editing attributes from the Attribute Table is similar to performing attribute edits in the Attribute window. For example, a field with a coded value domain has a drop-down list of acceptable values and a field with range domains allows the editor to enter the correct value.

The attributes of the three features identified through validation are displayed in the attribute table. We will give all three features **No Data** values for **Damage Type**, **Damage Severity** and **Defoliation Patterns**, (the **No Data** code for **Defoliation Patterns** is -1).

3. Click within the first empty box under **Damage Type**, and then select **No Data** from the list of valid values.

Year	Damage Type	Damage Severity	no_trees	host	for_type	Defoliation Patterns
2015	No Data		30	108	2108	12
2015			30	108	2108	12
2015			50	108	2108	12

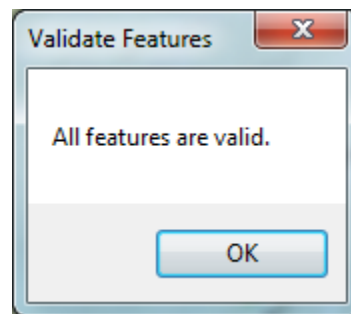
4. Using the same process, update the remaining records to reflect **Damage Type = No Data**.
5. For all three records, enter **No Data** for **Damage Severity** and **-1** for **Defoliation Patterns**. (Remember, **Defoliation Patterns** uses a range domain, these records will need to be entered manually).

Table						
Aerial_Damage_Survey_2015						
Year	Damage Type	Damage Severity	no_trees	host	for_type	Defoliation Patterns
2015	No Data	No Data	30	108	2108	-1
2015	No Data	No Data	30	108	2108	-1
2015	No Data	No Data	50	108	2108	-1

6. Close the Attribute Table.

## F. Revalidate Features and Stop Editing.

1. Re-run the Validate Feature command. You should get a notification stating: "All features are valid". If the notification states anything different, go back and check the previous attribute edits. There should also be no selected features.



2. Click **OK** to close the notification.
3. **Stop Editing** and **Save** your edits.
4. Unless you plan to continue with the Challenge, **exit ArcMap**.

## Part 7: Challenge: Export Schema to an XML file

*There may be instances where you need to create an empty geodatabase feature class, complete with defined field names and links to attribute domains, but without the GIS data. One of the primary methods to share geodatabase schemas is to export it to a geodatabase XML workspace document.*

*In this step, we will export the Aerial Damage Survey 2015 feature class to an XML Schema file. This will allow us to apply the schema to a new feature class for a new forest in the next step.*

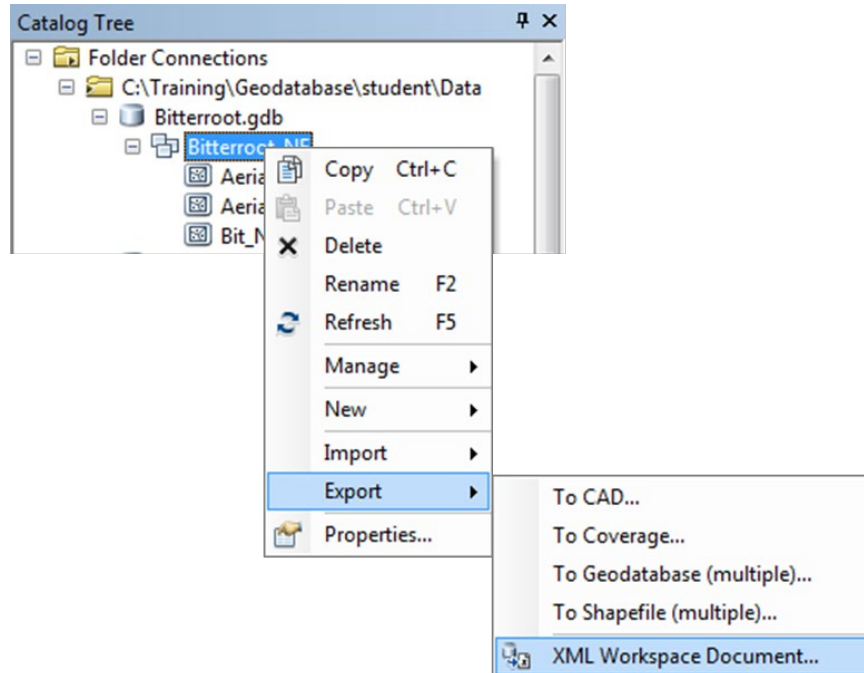
*In addition to creating an XML Schema of feature classes, you can create workspace documents of geodatabases, feature datasets and tables.*

### A. If needed, open ArcCatalog.

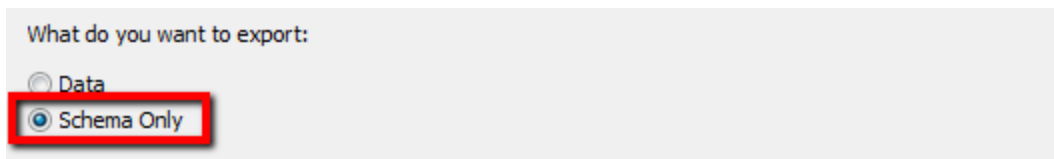
1. Browse to and highlight ...\\Data\\Bitterroot.gdb\\Bitterroot\_NF.

## B. Export a Feature Class Schema.

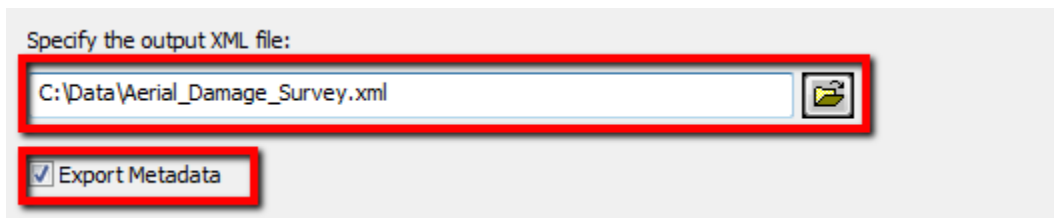
1. Right-click the **Bitterroot\_NF** feature dataset, point to **Export**; then click **XML Workspace Document**.



2. Because we want to export the schema without any records from the feature class we will select **Schema Only**.



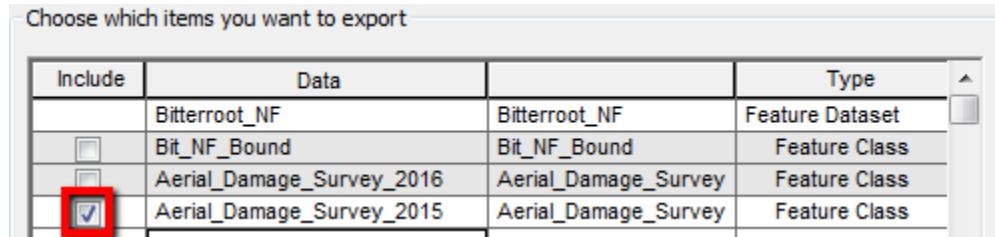
3. Browse to ...\\Geodatabase\\Data\\ and name the file **Aerial\_Damage\_Survey.xml**. (If needed, click the browse button).



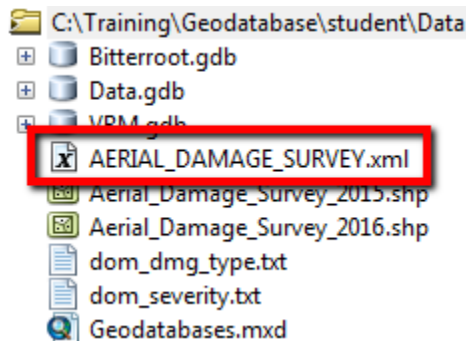
4. Because we want to export associated metadata we will **check** the **Export Metadata** check box.

Now we will specify the path and name of the new XML file. NOTE: You can save the document as an XML file or as a compressed ZIP file by giving the file an .xml or .zip extension when you type the path and name into the text box.

- Click **Next** to preview the contents of the schema information to be copied. This panel lists all the data items for which schema information will be copied.
- Ensure the include box is enabled adjacent to **Aerial\_Damage\_Survey\_2015**.



- If you would like to review a summary of the extraction contents and other optional settings, click **Summary**.
- When you are ready, click **Finish**. The .xml schema is created and placed in the ...\\Geodatabase\\Data folder.



## Part 8: Challenge: Import Schema from an XML file and load data

After a schema has been exported to an XML workspace document, it can be shared with other ArcGIS users who can import it into their own geodatabase, feature dataset or feature class. In this step, we will import an XML file, containing the schema needed to create your geodatabase feature class. Remember, an XML schema is a set of rules for creating standard information formats using customized tags, for example, the tag below creates a range domain:

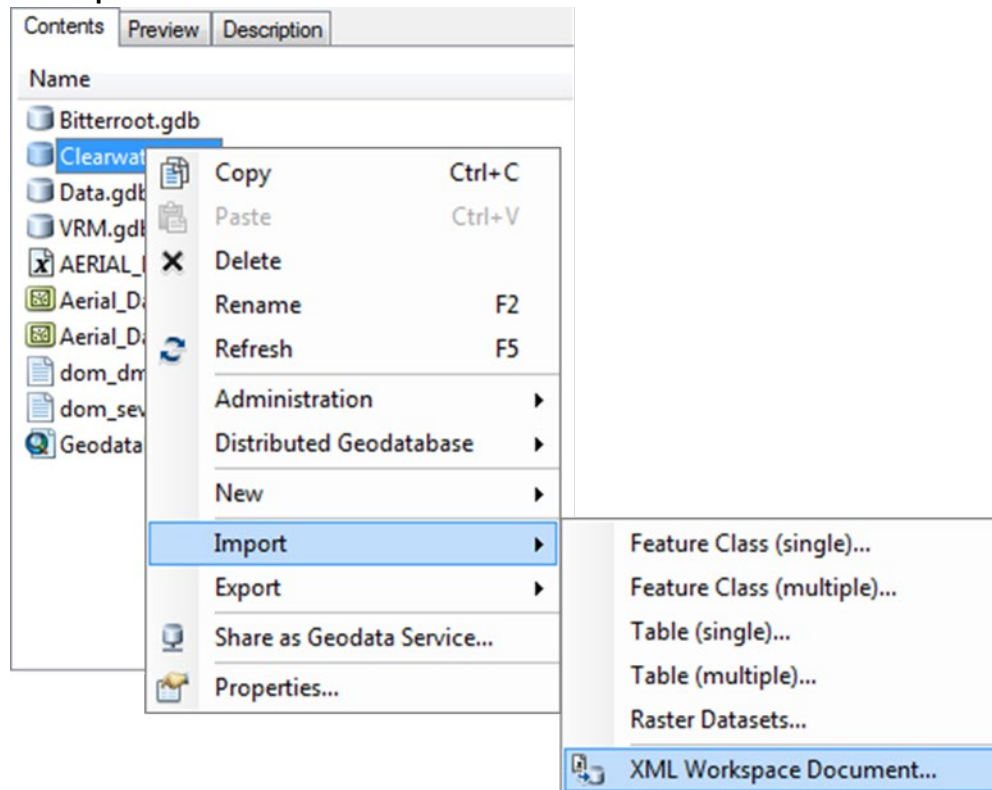
```
<Domain xsi:type="esri:RangeDomain">
  <DomainName>dom_pattern</DomainName>
  <FieldType>esriFieldTypeSmallInteger</FieldType>
  <MergePolicy>esriMPTDefault</MergePolicy>
  <SplitPolicy>esriSPTDefault</SplitPolicy>
  <Description>Defoliation Pattern Codes</Description>
  <Owner/>
  <MaxValue xsi:type="xs:short">4</MaxValue>
  <MinValue xsi:type="xs:short">-1</MinValue>
</Domain>
```

## A. Create a new geodatabase and feature class to import the schema.

1. Open the Catalog window within ArcMap.
2. Right click the ...\\Data\\ folder and select **New | File Geodatabase**.
3. Right click the New File Geodatabase, select **Rename**, and name it **Clearwater**.

## B. Import a Geodatabase Schema into the Clearwater File Geodatabase.

1. To import the schema into the new geodatabase, right click **Clearwater.gdb | Import | XML Workspace Document**.



2. Enable the option to import **“Schema Only.”**
3. For the XML source to import: browse to and select **Aerial\_Damage\_Survey.xml** from the ...\\Data folder.



Importing data to: C:\Training\Geodatabase\student\Data\Clearwater.gdb

What do you want to import:

☐ Data

☒ Schema Only

Specify the XML source to import:

C:\Data\AERIAL\_DAMAGE\_SURVEY.XML

4. Click **Next**. In the next window of the Import XML Workspace wizard, (below) a list of what the framework will include is displayed. Review the items and then answer the questions that follow.

Import XML Workspace Document

Name conflicts are displayed in red. To change a suggested name, type a new name in the Target Name column. If importing into a file or ArcSDE geodatabase, you can choose a configuration keyword from the Config Keyword drop-down list.

Type	Source Name	Target Name
Feature dataset	Bitterroot_NF	Bitterroot_NF
Feature class	Aerial_Damage_Survey_2015	Aerial_Damage_Survey_2015
CV domain	dom_dmg_type	dom_dmg_type
CV domain	dom_severity	dom_severity
Range domain	dom_pattern	dom_pattern

QUESTION: Will a feature dataset be created? \_\_\_\_\_

QUESTION: What will be the name of the new feature dataset? \_\_\_\_\_

QUESTION: What will be the name of the new feature class? \_\_\_\_\_

QUESTION: How many attribute domains will be created? \_\_\_\_\_

QUESTION: What will be the name of the new domains? \_\_\_\_\_

QUESTION: Will the domains be Code Values or a numeric range? \_\_\_\_\_

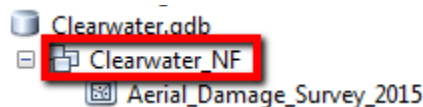
5. If you would like to see a preview a summary of the import, click the **Summary** button. (Click **OK** to close the summary).
6. Click **Finish**. The feature dataset is now ready to receive data.

## C. Load the new feature class with preexisting data.

1. Press the <F5> key to refresh ArcCatalog's **Contents** and to display the contents of the **Clearwater.gdb**.

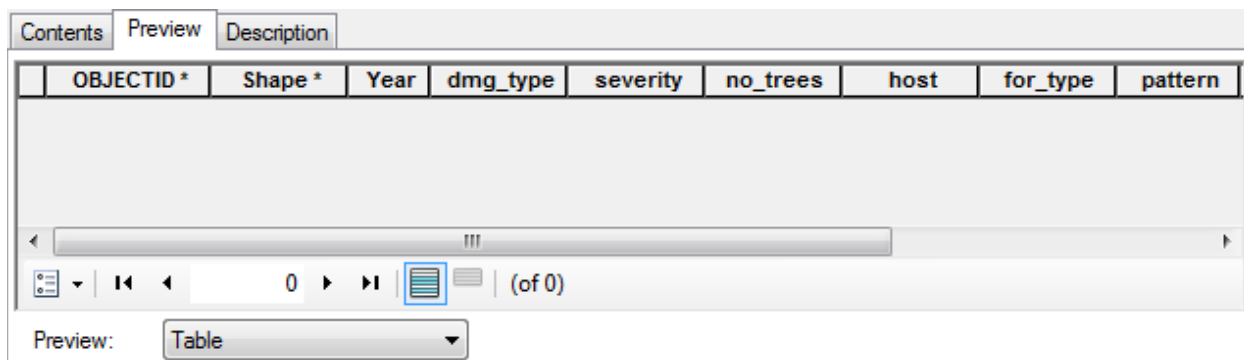


2. Change the name of the *Bitterroot\_NF* feature dataset to **Clearwater\_NF**. (Hint: right click the feature dataset).

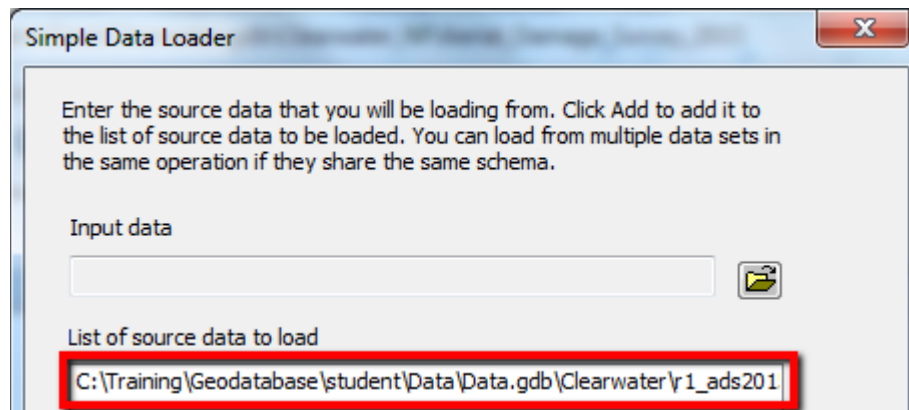


You have acquired feature classes containing 2015 Aerial Damage Surveys for Clearwater National Forest. You want to import the feature class features and attributes into the *Clearwater\_NF | 2015\_Aerial\_Damage\_Survey* feature class. We can use the **Simple Data Loader wizard** in ArcCatalog to do this.

3. Preview the table for the **Aerial\_Damage\_Survey\_2015** feature class. (HINT: Click the Preview tab and change the Preview method, bottom of window, to **Table**). The table contains all of the fields from the original dataset, but without any features.

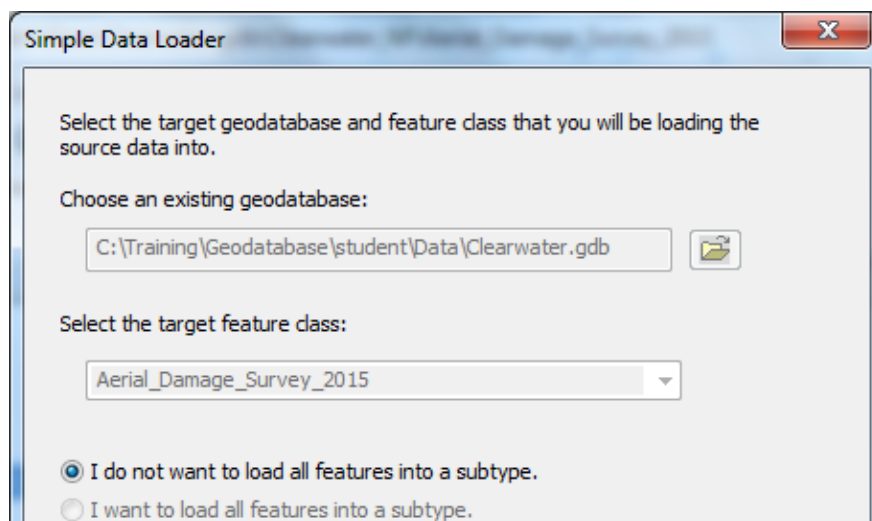


4. Activate the **Contents** tab and highlight the **Aerial\_Damage\_Survey\_2015** feature dataset in the Catalog Tree.
5. Right-click the **Aerial\_Damage\_Survey\_2015** feature class and choose **Load | Load Data**. The Simple Data Loader appears.
6. The first window of the Simple Data Loader provides a brief overview of the wizard. Read the description and then click **Next**.
7. The next page allows us to choose the source data to load. Browse to and add **r1\_ads2011dmg** from the **Data\Data.gdb\Clearwater** directory.



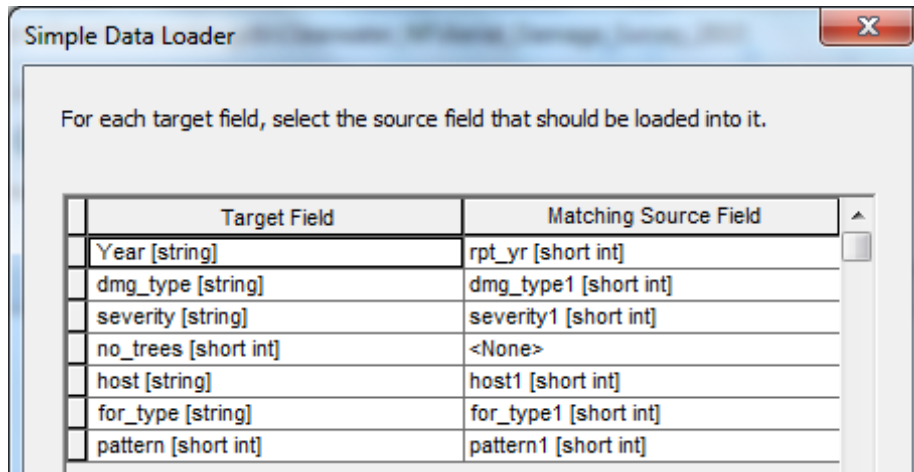
8. Click **Add**, and then click **Next**.

*In this window (pictured below), notice all parameter fields are disabled. This is because we launched the Simple Data Loader DIRECTLY from the Aerial\_Damage\_Survey\_2015 feature class and the tool already knows the names of the geodatabase and target feature class. Depending on a geodatabase's schema, it is possible to load source data into a subtype. However, because our geodatabase has no subtypes, the option is unavailable.*



9. Click **Next**.

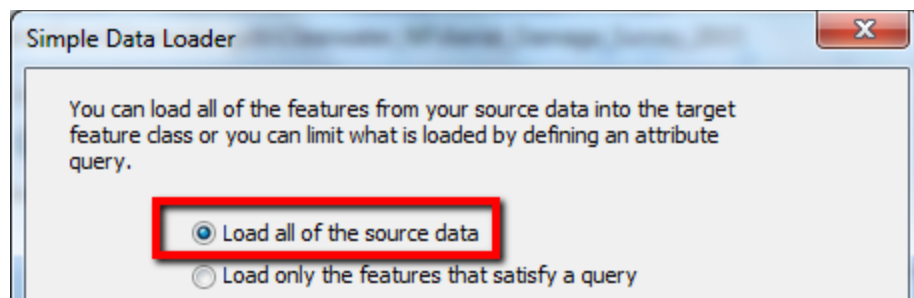
10. In the next window (right) you can change how the Source fields correspond to the Target fields. For this example, match each field as displayed below: *(HINT: each Matching Source Field contains a list of values from the source feature class).*



For each target field, select the source field that should be loaded into it.

Target Field	Matching Source Field
Year [string]	rpt_yr [short int]
dmg_type [string]	dmg_type1 [short int]
severity [string]	severity1 [short int]
no_trees [short int]	<None>
host [string]	host1 [short int]
for_type [string]	for_type1 [short int]
pattern [short int]	pattern1 [short int]

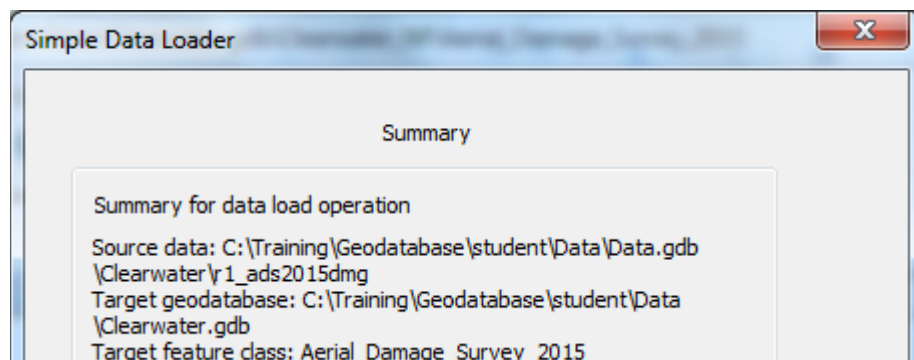
11. Click **Next**.
12. The next window (pictured below), allows you to load the entire source data, or build a SQL query to extract only those features that satisfy the conditions of the query. We will **load all of the source data**. Click **Next**.



You can load all of the features from your source data into the target feature class or you can limit what is loaded by defining an attribute query.

☒ Load all of the source data  
☐ Load only the features that satisfy a query

13. The last page of the Simple Data Loader provides a summary of the parameters chosen for the operation. Verify the parameters of the operation, then click **Finish** to execute the process.



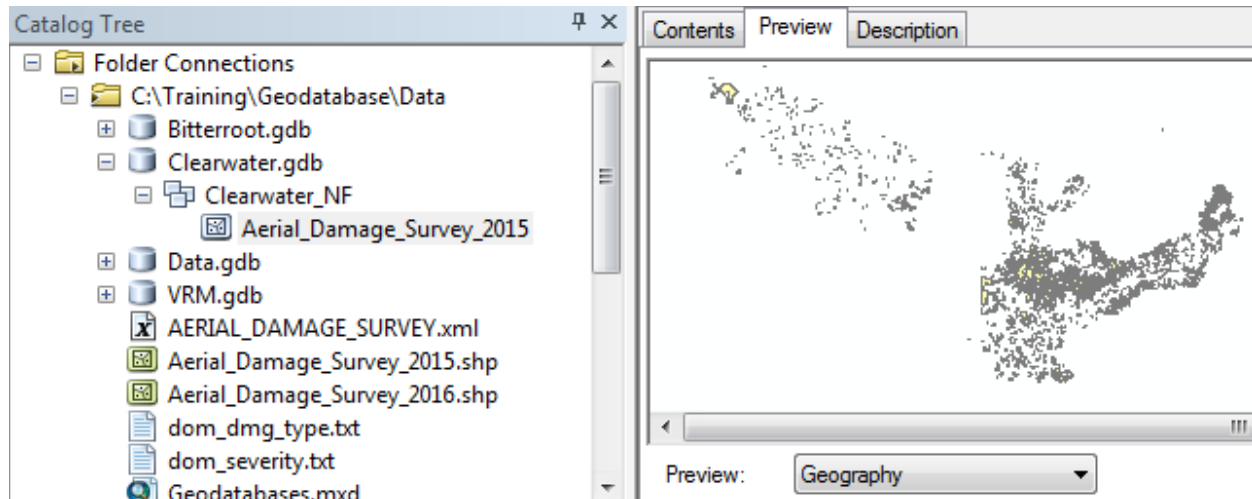
Summary

Summary for data load operation

Source data: C:\Training\Geodatabase\student\Data\Data.gdb  
 \Clearwater\1\_ads2015dmg  
 Target geodatabase: C:\Training\Geodatabase\student\Data  
 \Clearwater.gdb  
 Target feature class: Aerial\_Damage\_Survey\_2015

## D. Preview the Geography and Attributes of Clearwater NF's 2015 Aerial Damage Survey.

1. Ensure **Clearwater.gdb/Aerial\_Damage\_Survey\_2015** is selected in the Catalog Tree, and then select **Geography** from the **Preview** dropdown. Your dataset should look like the data displayed below.



2. Change the Preview tab to Table.

Contents

Preview

Description

	Year	dmg_type	severity	no_trees	host	for_type	pattern	
▶	2015	Mortality (Current Year)	No Data	<Null>	202	1202	-1	
	2015	Defoliation	High (More then 50 % defoliation)	<Null>	263	4263	1	
	2015	Mortality (Current Year)	No Data	<Null>	108	2108	-1	
	2015	Mortality (Current Year)	No Data	<Null>	108	2108	-1	
	2015	Mortality (Current Year)	No Data	<Null>	108	2108	-1	
	2015	Mortality (Current Year)	No Data	<Null>	108	2108	-1	
	2015	Mortality (Current Year)	No Data	<Null>	108	2108	-1	
	2015	Defoliation	High (More then 50 % defoliation)	<Null>	263	4263	1	
	2015	Defoliation	High (More then 50 % defoliation)	<Null>	263	4263	1	

1

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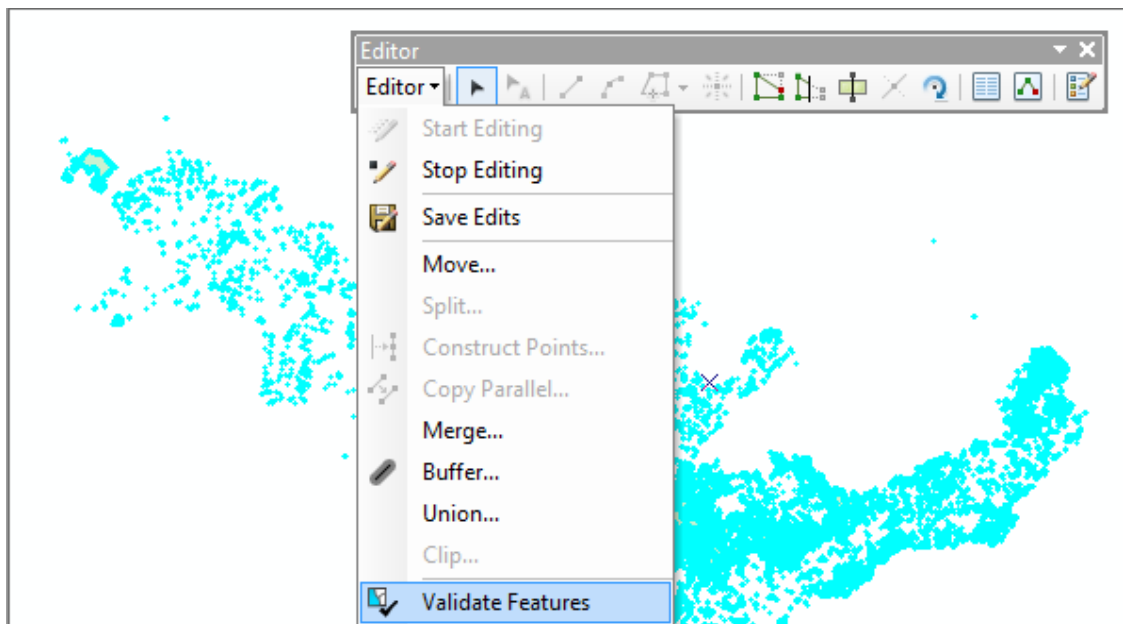
Preview: Table

Pay close attention to the **dmg\_type**, **severity** and **pattern** fields. Because the domains created earlier were included as part of the XML export and import, these fields reflect the properties of the domains assigned to the original feature class fields. So not only do we retain properties like field names and types, but also, the attribute domains that were assigned to those fields. Let's validate this dataset's attributes.

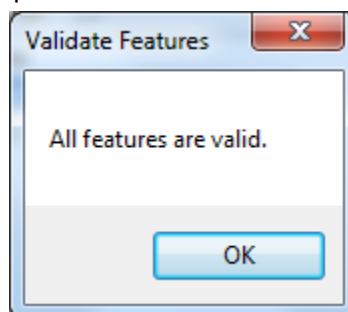
## Part 9: Challenge: Import Schema from an XML file and load data

## A. Add the **Aerial\_Damage\_Survey\_2015** Layer to ArcMap and Start an Edit Session.

1. Launch ArcMap.
2. From the **ArcMap—Getting Started** dialog, click **Cancel** to open a *New Empty Map*.
3. Drag **Clearwater NF's Aerial\_Damage\_Survey\_2015** from *ArcCatalog* to *ArcMap's Data View*.
4. Exit *ArcCatalog*.
5. From ArcMap's Table of Contents, start an edit session by right clicking *Aerial\_Damage\_Survey\_2015*, selecting **Edit Features | Start Editing**.
6. If needed, click the **Zoom to Full Extent** button.
7. From the *Tools Toolbar*, click the **Select Features on Screen** button you added earlier. (If the tool is no longer there, refer to Step 6 on page 17).



8. From the Editor toolbar, Select **Editor | Validate Features**.
9. The Validate Features popup should state **All features are Valid**. Click **OK**.



10. **Stop Editing** and **Save** your edits and exit ArcMap.

You have completed Exercise 2