

Chapter 8 - Stage 1 Analysis

Introduction

The focus of this chapter is the transition from gathering data on all stands to specific Areas of Interest (AOIs). To decide which areas are AOIs, all interested parties must be involved. Most AOIs will be developed because of the potential for treatment or special designation (e.g. - SCA)

This chapter is divided into 4 sections:

- Definition of Terms
- Making Decisions
- Analysis Tools – Data Layers, Standard Stage 1 Reports and more information on the Symbol Picker and Query Ladder.
- Determining 'Areas of Interest' (AOIs)

Definition of terms

Area of Interest (AOI) – An Area of Interest is just that – a contiguous area that is of interest for management purposes, either strategic or tactical. Where stands are based on cover type, an AOI may be both cover type and management based. It may have the same geography as a stand, or may be a portion of a stand.

In some limited cases with designations of Special Conservation Areas, an AOI could overlap multiple stands and even cross compartment boundaries.

AOIs generally are nominated for two reasons:

Treatments - The parent stand (or a portion of it) are of interest for a potential treatment.

Designations - A stand (or collection of stands) meets the criteria to be a Special Conservation Area (SCA, as outlined in WI 1.4), and is not currently identified in the Spatial SCA database in the GDSE.

Making Decisions

Once we have a basic inventory of the entire compartment (Stage 1), the focus shifts to management opportunities, and the designation of Areas of Interest for treatment or designation. It is important that stand examiners continue to work throughout the inventory year with co-managers (Forestry, Fisheries, and Wildlife Staff). Be sure to notify your co-managers at each step in the inventory process at which new data or management proposals are available for review.

Whenever one of the following milestones is accomplished, it would be appropriate to notify all individuals that regularly participate in the Compartment Review process.

- Pre-Inventory stands are transferred to Stage 1 Forested and Nonforested data layers.
- The stand examiner's initial AOIs are developed and created in the AOI layer.
- Draft Treatment proposals are complete and available for review in the Treatments layer.
- Site Conditions layer is digitized.

What do we need to decide?

- First – decide which stands should be AOIs based on current stand geography...
- Then decide the shape of the AOI. Does it encompass all or part of an existing stand?
- Then decide if any additional data is needed, and a return trip to the field is necessary.

What to look for when determining Areas of Interest

As defined above, there are two reasons to name an AOI:

- The area may be considered for **treatment** this decade. Treatments vary, and include common activities like commercial timber harvests, or nonforested opening maintenance, and less common activities such

as changes in water level control structures or stream bank stabilization. Some of these areas may need site specific information to help make treatment decisions, or currently available information from Stage 1 may suffice.

- The area may meet criteria for a specific **designation** (Special Conservation Area). If site specific information is needed to help determine potential designations, an AOI could be nominated and further data collected. Please refer to Work Instruction 1.4 and Appendix H for more details on coding SCAs.

When selecting potential AOIs, consider the following factors:

- Based upon information presented at your FMU Pre-Inventory Meeting (e.g. - forest cover type and age class composition) should additional AOIs be nominated to meet goals and objectives for the landscape? Should fewer AOIs be nominated for the same reason? An example of this would be an area where quarter township aspen harvests were done in the past, and there is an abundance of 30-40 year old aspen. An interested party may wish to see AOIs created to determine the possibility of breaking that age distribution up. What is happening with cover type and age class composition in the adjacent compartments? Across the Management Area? Eco-region? Review the Frozen OI layer to determine possible Green-up conflicts.
- Silvicultural readiness: Using the Stage 1 data, consider age, density, and species composition. Which areas have potential for treatment based on those features? Hint: use the symbol picker on the Forest Stands and choose "Meets Generic Silvicultural Criteria".
- Stand condition: Has past treatment or another situation made an area of interest for a potential follow-up treatment?
- Forest Health: General and/or specific forest health concerns often lead to management considerations. For example, ash concentrations in a stand may be too high to withstand an EAB outbreak, or the beech bark disease killing front may impact specific stands in this compartment.
- Habitat concerns: Does wildlife management point to potential treatment? For example, is an area scheduled for Kirtland's Warbler management in the next 10 years?

- Regeneration concerns: Did the Stage 1 survey show failed or poor regeneration in an area that was previously harvested? The area may be of interest for a regeneration survey and/or follow-up cultural treatment.
- Unique site: Is this area nominated to be included as a Biodiversity Stewardship Area? **Only use the Unique Site characteristic for the capturing of areas that are to be nominated for inclusion as SCA's.** Do not code AOI's that are of Interest for other reasons (Treatment, etc.) as "Unique Site". Do not code existing SCA's (see the Biodiversity layers) as AOI's for "Unique Site". **Refer to Appendix H for further direction.**
- Program specific concerns: Is further data needed to aid in decision making related to specific program concerns? For example, is a recreational trail site present or planned that may give an area treatment potential such as removal of some of the pine overstory above a cross-country ski trail to allow more snow to reach the forest floor.
- Is there another reason that additional information may need to be gathered or an area may need treatment? These can be described in comments.

Stage 1 Data Analysis & Tools

The Data

While the GDSE has dozen's of data sets that may be useful for analyzing your stand data, and determining potential management options, this portion of the manual will focus on the stand data directly generated during the inventory process. This includes:

- Forested stands
 - Canopy species
 - Subcanopy species
- Nonforested stands

The Tools

Each person will develop ways to look at the compartment from their own point of view. The tools below allow you to look at the same data in different ways, allowing you to choose which option best answers the questions you may have. Become familiar with each tool so you can feel confident looking up answers to questions you may have. Many tools work best in combination with others. Try each and see which tools or combinations of tools work best to answer your questions about the data.

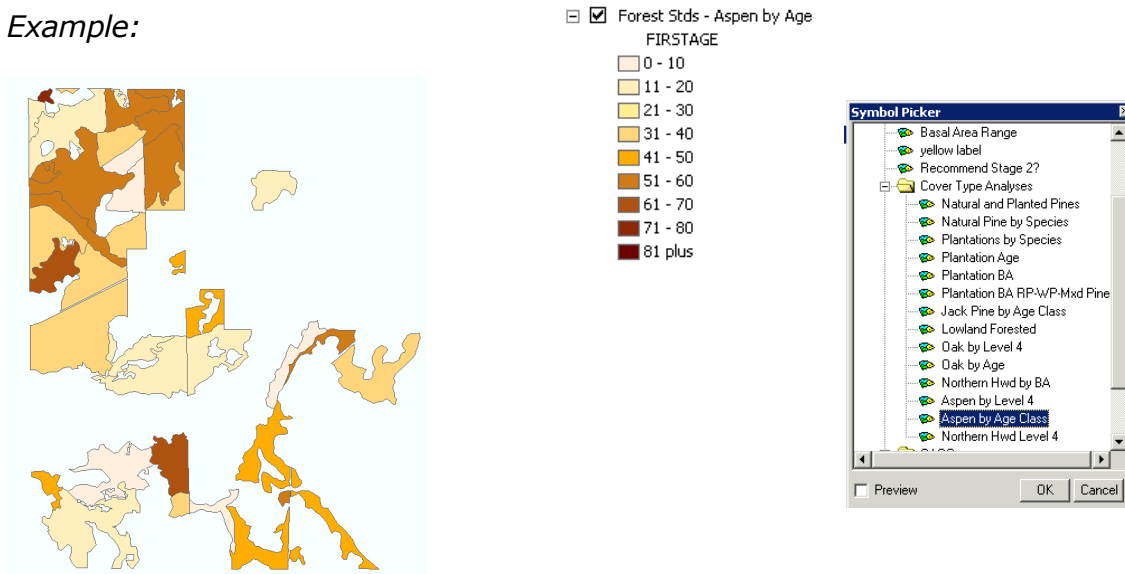
- **Symbol Picker** – spatial tool, best used to view stand data in specifically symbolized ways (e.g. – color coded by covertime, age, etc.)
- **Stage 1 Info Tool** - creates an electronic “stand sheet” that gives you an at-a-glance view of most stand data. Can be used to generate a printable stand sheet report too.
- **Stand Listing Reports** – Used for Open House/Compartment Review packets. They contain the standard stand details we customarily report, and are available using the RAD Tools application. They are also useful for a Pre-Review meeting.
- **Standard (GDSE) Stage 1 Reports** – generates electronic stand sheets for a selection (from one stand, to a whole compartment or more) in Excel format for easy sharing, printing, etc. Best used to make your Stage 1 data somewhat ‘portable’ and easy to share with anyone.
- **Covertime, Acres, and Age summary** – generates the breakdown of acres by covertime and age class for a compartment. This report is generated using the RAD Tools application.
- **Definition Queries** – can be used to customize how a layer is displayed. You can filter out stands that only meet certain criteria, etc. Many of the Symbol Pickers are built with Definition Queries.
- **Custom Queries in ArcMap**
 - Attribute Query – can be used to find stands that meet certain criteria (covertime and ages, etc.).
 - Spatial Overlay Query – can be used to locate stands geographically as they relate to other features (e.g. – northern hardwood stands within ¼ mile of a deer yard).
- **Custom Stage 1 Reports** – These generate custom exports to Excel or Access for specific analysis projects.

- **Site Conditions Layer** – spatial tool, best used in conjunction with symbol picker (meets silvicultural criteria). Analysis tool can be run after AOIs (optional) and/or Treatments (required) have been created.

Symbol Picker

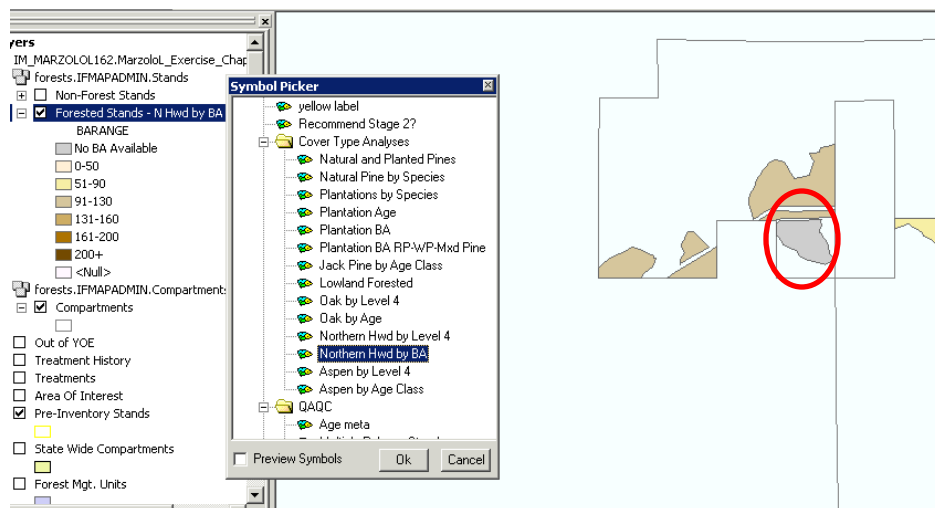
The Symbol Picker is introduced in Chapter 2 and Appendix Z. Specific renderings of the Forested Stands Layer have been developed to assist in analysis of potential Areas of Interest.


Example:

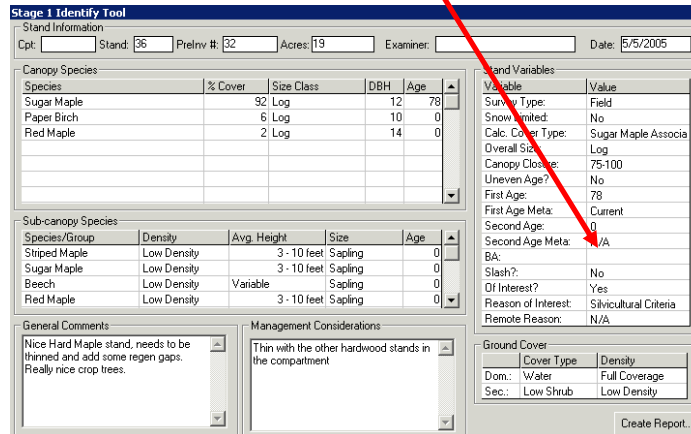


For example, this "Aspen by Age Class" symbol picker can be used to identify the spatial distribution of aspen ages across a compartment, land type association, or other geographical area.

Symbol pickers can also be used for quality control. In the example below, the symbol picker is set to show northern hardwood stands (level 3 = 411) by Stage 1 basal area range. You can see that the stands in general range in BA from 91-130, but no basal area is available for stand 36.



Using the Stage 1 Attributes Tool, , you can verify that, indeed, no BA was entered. You could then discuss this with the stand examiner to find out if that information is available.



Stage 1 Identify Tool

Stand Information
 Cpt: [] Stand: 36 Prelim #: 32 Acres: 19 Examiner: [] Date: 5/5/2005

Species	% Cover	Size Class	DBH	Age
Sugar Maple	92	Log	12	78
Paper Birch	6	Log	10	0
Red Maple	2	Log	14	0

Species/Group	Density	Avg. Height	Size	Age
Striped Maple	Low Density	3 - 10 feet	Sapling	0
Sugar Maple	Low Density	3 - 10 feet	Sapling	0
Beech	Low Density	Variable	Sapling	0
Red Maple	Low Density	3 - 10 feet	Sapling	0

Stand Variables

Variable	Value
Sun. Type:	Field
Snow. Limited:	No
Calc. Cover Type:	Sugar Maple Associa
Overall Size:	Log
Canopy Closure:	75-100
Uneven Age?	No
First Age:	78
First Age Meta:	Current
Second Age:	0
Second Age Meta:	N/A
BA:	N/A
Slash?:	No
OI Interest?:	Yes
Reason of Interest:	Silvicultural Criteria
Remote Reason:	N/A

General Comments: Nice Hard Maple stand, needs to be thinned and add some regen gaps. Really nice crop trees.

Management Considerations: Thin with the other hardwood stands in the compartment.

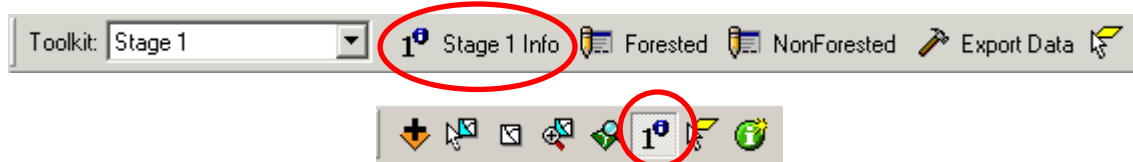
Ground Cover:

Cover Type	Density
Dom.: Water	Full Coverage
Sec.: Low Shrub	Low Density

Create Report...

Stage 1 Info tool

The Stage 1 Info tool allows the user to view Stage 1 information for any stand. The tool is available either from the Stage 1 Toolkit or from the standard IFMAP toolbar.



Click on the button and then click on any Forested or Non-forested Stand to return the info form.

Stage 1 Identify Tool

Stand Information
 Cpt: 61033 Stand: 111 Prelv #: 107 Acres: 60.01 Examiner: Scott Lint Date: 6/2/2003

Species	% Cover	Size Class	DBH	Age
Red Maple	45	Log/Pole	14	0
Black Cherry	30	Log/Pole	14	0
Sugar Maple	20	Log/Pole	14	0
Beech	5	Log	14	0

Species/Group	Density	Avg. Height	Size	Age
Eastern Hemlock	Low Density	Variable	Pole	0
Serviceberry(Juneberry)	High Density	3 - 10 feet	Tall Shrub	0
Black Cherry	Medium Density	10 - 20 feet	Sapling	0
American Beech	Low Density	3 - 10 feet	Sapling	0

General Comments
 stand was thinned last entry period, cherry stumps sprout regen. "carpet of blackberry and raspberry"

Management Considerations
 few wet areas, vernal pools, access requires some road improvement and permission to cross Consumers Energy property

Stand Variables

Variable	Value
Survey Type:	Field
Snow Limited:	No
Calc. Cover Type:	Maple, Beech, Cherry
Overall Size:	Log
Canopy Closure:	75-100
Uneven Age?	Yes
First Age:	0
First Age Meta:	Unspecified
Second Age:	0
Second Age Meta:	Unspecified
BA:	
Slash?:	No
Of Interest?:	No
Reason of Interest:	N/A
Remote Reason:	


	Cover Type	Density
Dom.:	Forb/Fern	High Density
Sec.:	Seedlings	Low Density

Create Report...

If desired, use the Create Report button on lower right corner of the form to generate a Stage 1 Details report (described below) for the selected stand.

Stand Listing Reports

These reports are created using the RAD Tools application. They are used in the postings for our Open House and Compartment Review packets.

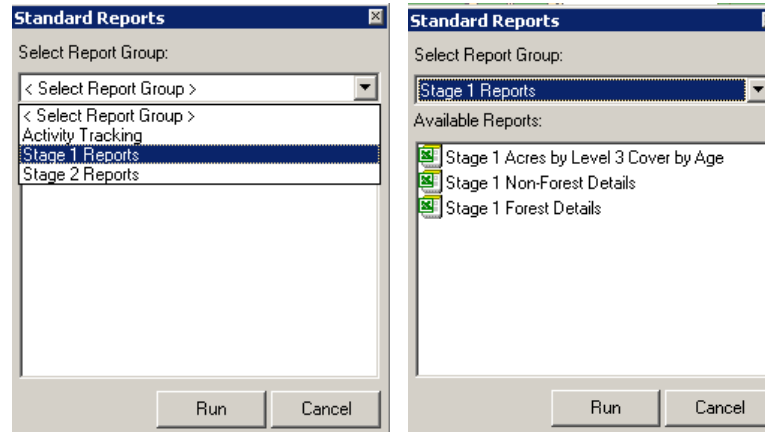
Stand	Traverse City Mgt. Unit		FORESTED STAND LISTING REPORT			Compartment: 012	 Page 1 of 4
	Level 4 Cover Type	Size Density	Acres	Stand Age	BA Range	Date 04/07/2009	
2	6120 - Lowland Cedar	Medium Density Pole	10.9	113	111-140	Small amounts of paper birch, basswood. Fair amount of blowdown.	
3	4110 - Sugar Maple Association	High Density Log	26.5	89	111-140	Small amounts of red oak, yellow birch, black cherry. Middling quality hardwoods. Little CWD, snags, or vertical diversity. Red maple and quaking aspen are on lower part of slope at NW end of stand. Scattered understory hemlock.	
4	4130 - Aspen	High Density Pole	20.7	32		Scattered red oak, sugar maple, black cherry, white ash poles.	

Standard GDSE reports


The basic reports that can be generated within the GDSE can be found from the QRM Toolkit > 'Reports' for both Forested and Non-Forested Stands.

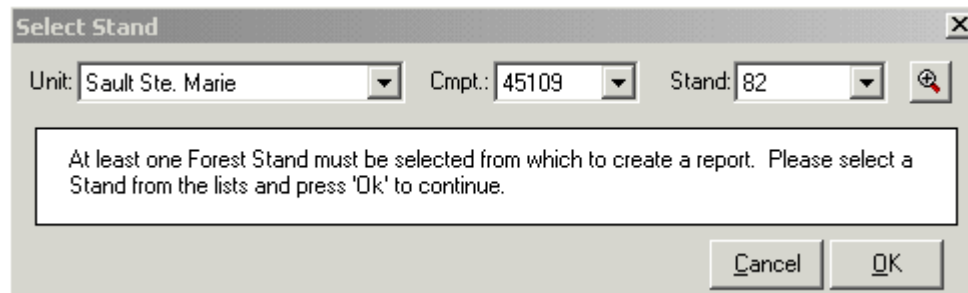


Select the QRM Toolkit and click the 'Reporting' button.



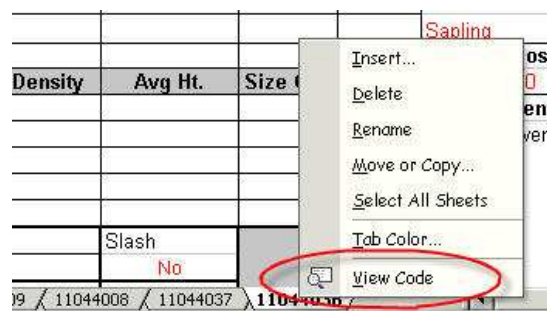
The Standard reports form is displayed. Select Stage 1 from the drop down menu. Select the desired report.

Stage 1 Forest (or Non-Forest) Details Reports: If Stage 1 Forest Details is selected; once "Run" is pushed the tool will ask you to select a stand. If you would like to make a report of more than one stand (or the whole compartment), select those stands using the "Select features" tool. 

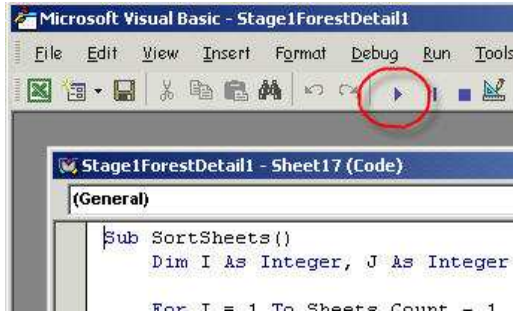



Vertical Layer		Species	%Cover	Size Cl. S-P-L-X	Avg. Dbh	Age	Stand Variables	
		Beech	2%	Log/Pole	10	0	Survey Type	Calc. Cov Type
		Paper Birch	30%	Log/Pole	12	0	Field	4119 - Mixed Northern Hardwoods
		Sugar Maple	18%	Log/Pole	10	0	Plantation	Uneven Age?
		Red Maple	50%	Log/Pole	10	68	No	No
Forest Canopy							1st Age:	1st Age Meta:
							68	Current
							2nd Age:	2nd Age meta:
							0	Unspecified
							Overall Size:	Stand of Interest?
							Log	No
							Canopy Closure:	Why of Interest?
							75-100	Unspecified
		Species/Group	Density	Avg Ht.	Size Cat.	Age	Management Considerations:	
Sub-Canopy	Serviceberry (Juneberry)		Low Density	3 - 5 feet	Tall Shrub	0	If/when manage stand, it will be a combination of selection and shelterwood.	
	Red Maple		Medium Density	20 - 30 feet	Sapling	0		
	Beech		Low Density	10 - 20 feet	Sapling	0		
	Sugar Maple		Low Density	20 - 30 feet	Sapling	0		
must be taller than 3'		Balsam Fir	Medium Density	10 - 20 feet	Sapling	0		
Ground Cover	Predom.			Slash				
	Secondary			No				
				Snow ?				
BA Range	81-110			No				
General Comment:								
Has some potential where sugar maple is present. There are pockets of low quality red maple with paper birch; and balsam understory heavy here. Paper birch dying out.								

TIP for Excel workbooks of multiple stands: If you create a workbook of multiple stands, it is helpful to sort them by stand number. To do this, right click on the workbook tab at the bottom of the page, then choose "View Code" from the list of options.



A window will pop-up for Microsoft Visual Basic Editor. Just look for the "Play" button in the upper left part of the screen.



Click this "Play" button, then close the pop-up window by clicking the "X" in the upper right of the screen. 

Your sheets should now be sorted.

Covertime, Acres, and Age summary: This report is generated using the RAD Tools application. It is included as part of the Open House web packets. Disregard the report that can be generated using the QRM Toolkit. The official record of this data is generated using the RAD Tools application.

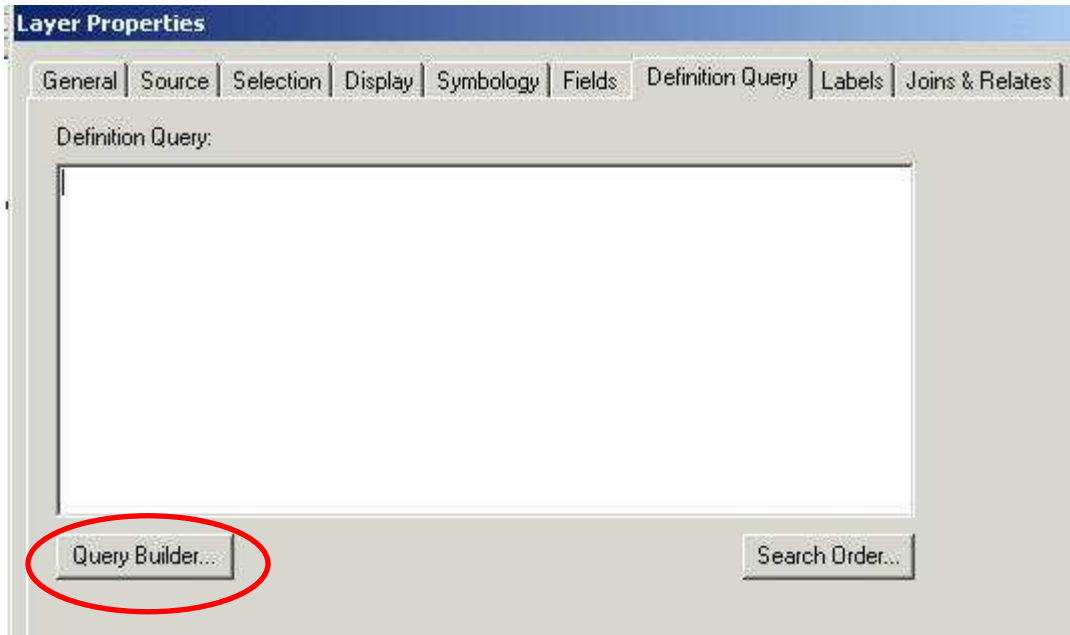
These reports is summarizes cover type and age information for an entire compartment.

	Age Class														Total	
	Non-Forested	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	120 +		Uneven Age
Aspen Types	0	135	209	386	0	0	20	0	26	37	0	0	0	0	34	845
Emergent Wetland	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
Herbaceous Openland	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
Low-Density Trees	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Lowland Coniferous Forest	0	0	0	137	0	40	45	17	4	2	4	0	14	0	0	262
Lowland Deciduous Forest	0	0	12	0	0	0	0	7	0	0	0	0	0	0	0	19
Lowland Mixed Forest	0	0	13	0	0	0	0	0	0	0	0	0	8	0	0	21
Lowland Shrub	410	0	0	0	0	0	0	0	0	0	0	0	0	0	0	410
Mixed Upland Conifers	0	0	0	7	13	0	9	0	0	0	0	0	0	0	0	28
Mixed Upland Deciduous	0	0	0	0	0	0	0	0	47	4	0	0	0	0	0	51
Natural Pines	0	0	0	0	0	0	0	20	8	0	0	0	0	0	0	28
Northern Hardwood	0	0	0	0	0	0	0	21	0	10	0	0	0	0	0	31
Other Upland Conifers	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Other Upland Deciduous	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
Planted Pines	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	32
Road/Parking Lot	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Sand, Soil	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Upland Mixed Forest	0	0	0	0	0	0	0	8	0	0	10	0	0	0	0	17
Water	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
Total	526	135	237	563	13	40	74	73	88	53	13	0	22	0	34	1868

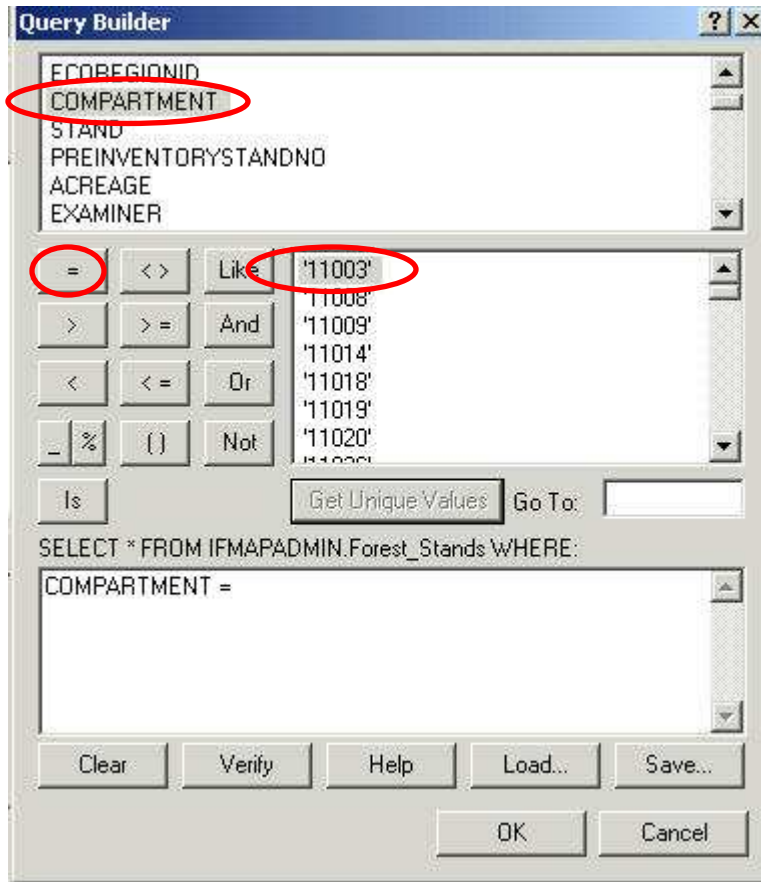
Definition Queries

Definition Queries can be used to customize how a layer is displayed. You can filter out stands that only meet certain criteria, etc. Many of the Symbol Pickers are built with Definition Queries.

To create a Definition Query, open the layer properties for the data you'd like to analyze (e.g. Forest Stands). Next, click on the "Query Builder..." button:



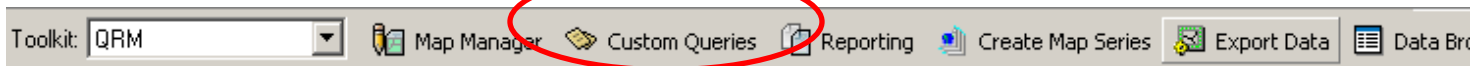
Using the Query Builder, write a query statement that narrows the data down to exclude what you don't want to show, or have it include only very specific information.



The example above is being written so that only **Forested** stands in **Compartment 11003** will be displayed. Any adjacent stands will not show on the screen.

To “undo” a definition query, simply highlight and delete the text in the query statement.

Custom Queries in ArcMap



The 'Custom Queries' tool is located on the QRM toolkit. It can be used to create a query that can have multiple steps, allowing you to save those queries and run them again without re-writing them.

Decide if you want to run an Attribute Query or Overlay Query, then follow the instructions below:

Attribute Query

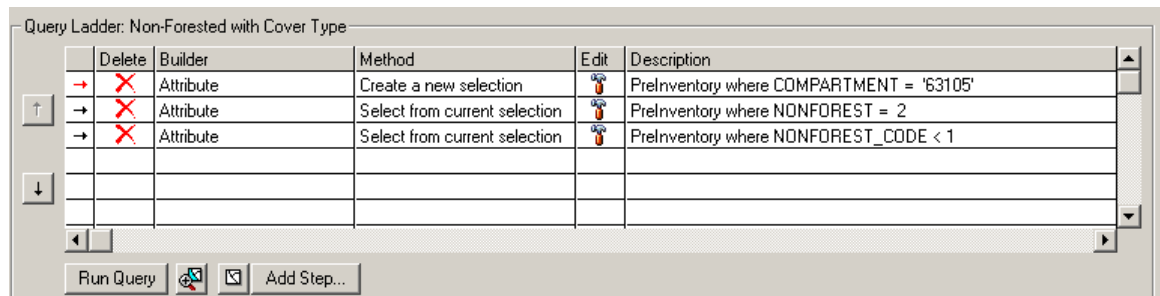
An attribute query is a selection of records/features using attribute values (i.e. non-spatial database definitions). For example, selecting all non-forested stands in compartment 63105 where the non-forest code is unspecified. Several custom queries are already pre-made in the System Queries tab.

Using the query ladder, select Attribute as the builder.

This example would take 3 steps:

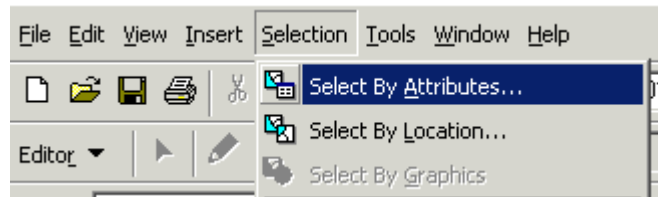
1. Select all stands in compartment 63105.
2. From that selection, select the non-forested stands.
3. From that selection, select those with non-forest code = unspecified.

The custom query would look something like this using the query ladder:



That selects all Pre-Inventory Stands in Compartment 63105 that are Non-forested and have no valid Non-forest code label.

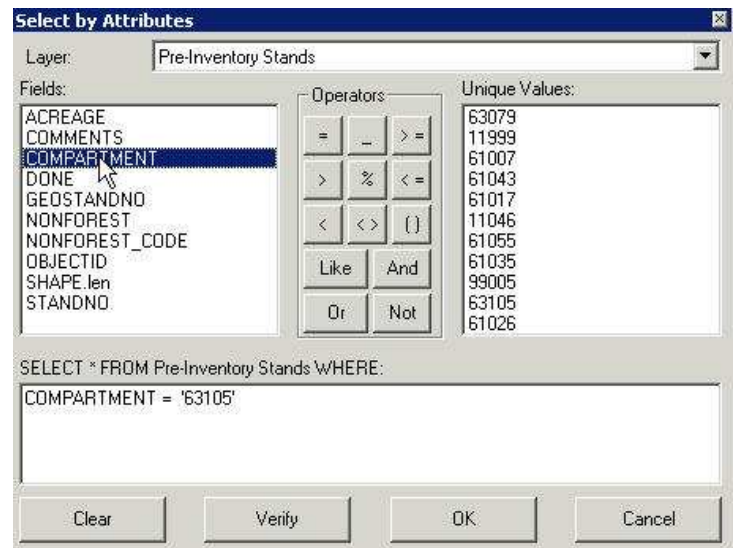
Using the Select by Attributes



To build each query step, you must select:

1. the layer to select from (i.e. Pre-Inventory Stands)
2. the field you wish to query (e.g. 'Compartment')
3. the values you wish to select (e.g. 63105).

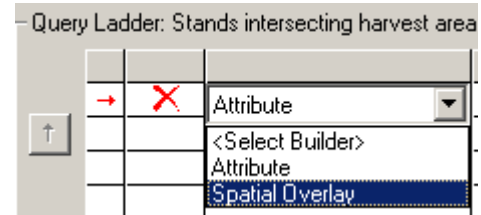
Attribute values can be selected from the "Unique Values:" list or can be keyed in.




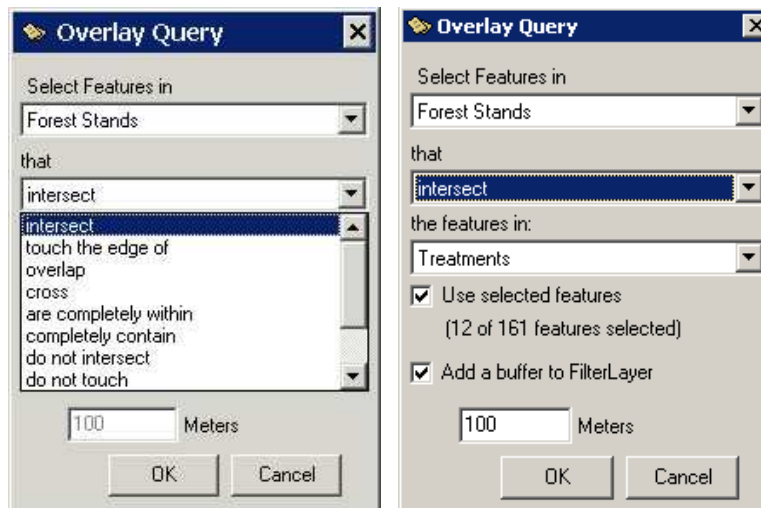
Overlay Query

An overlay query uses spatial definitions such as proximity or intersection to select a feature. For example, selecting all forested stands that come within 300 feet of an existing treatment area.

You would start again with the query ladder, this time selecting Spatial Overlay as the builder.



Continue with the query. When you select the edit tool , you will get an overlay query screen:



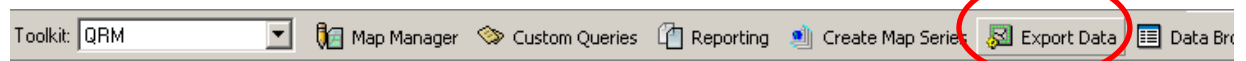
To define an overlay, you need to define:

1. the layer you are selecting features from (i.e. Forest Stands)
2. the method of spatial overlay you wish to use (i.e. intersect).
3. the features you wish to use to select from (i.e. intersect with existing selected Treatment Areas). This is referred to as the Filter Layer.

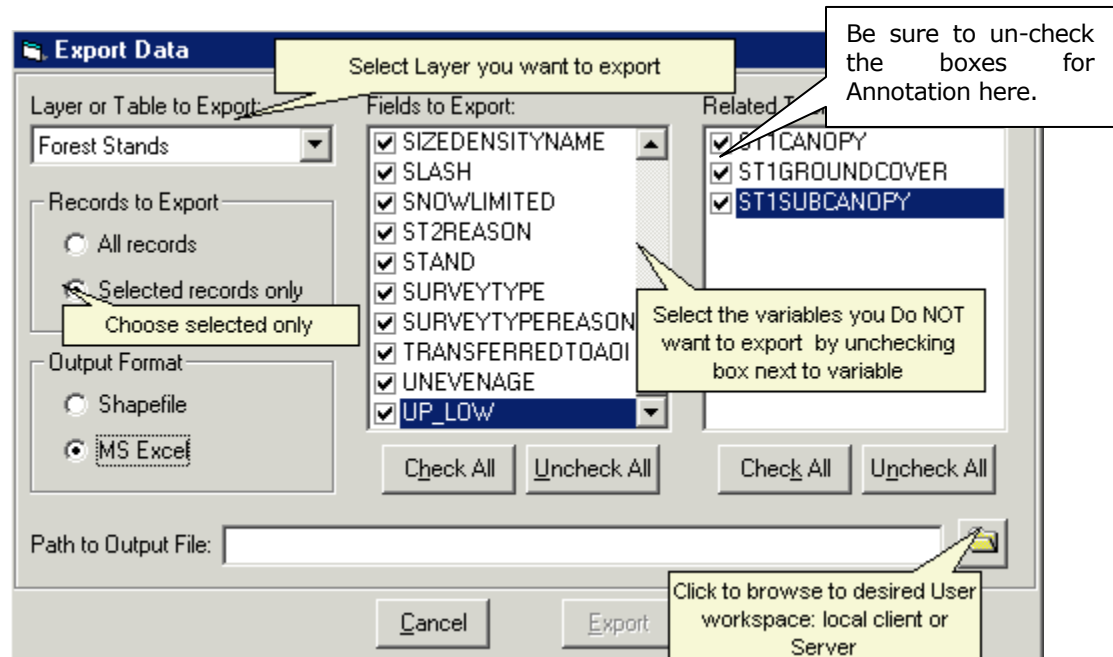
NOTE: Be sure to select the geographic area you wish to work in on any query. IFMAP is a statewide database – if you don't limit the area, you will be querying the entire state. **This will slow down all actions and could crash your session.** Some strategies to consider in order to make your query run include using preliminary selection steps that decrease the number of records being compared or analyzed at each step, and even running sequential queries that build off of the previous selection.

Custom Stage 1 Reports – Export to Excel

To create your own report/queries in Excel or Access, use the Export to Excel option.



- Select the desired record set (e.g. specific compartment or region of interest).
- Click the Export Data button. Select items in graphic on next page:



If desired, these tables could then be imported into an Access database and the table joins reestablished to take advantage of flexible Access reporting & charting capability across the related tables.

Determining 'Areas of Interest'

Using the analysis tools above, review your initial "Of Interest? = Yes or Maybe" calls from the field. **Hint:** use the symbol picker on Forest Stands and choose "Of Interest?".

- Should all of these stands be flagged for potential treatment or designation?
- Are there additional stands that should also be identified as AOIs?
- Are there stands that after further Stage 1 review, are no longer "Of interest?".

Compile a list of stands that you want to nominate as AOIs and then proceed to use the Management Notes tool (as outlined in the next chapter) to complete the process for creating AOIs.

Remember that Forested stands of interest that were identified as "Of Interest? = Yes or Maybe" during Stage 1 data collection will be automatically identified and require further review.

Nonforested stands of interest must be identified and manually added as Areas of Interest during the Post Stage 1 process.

Again, follow the instructions in the next chapter to nominate Nonforested AOIs and any additional Forested AOIs.