SIMFOR Version 3.01 User Manual

Ralph Wells and Arnold Moy
Centre for Applied Conservation Research
Faculty of Forestry
University of British Columbia
Vancouver B.C.

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SIMFOR Web Page: www.forestry.ubc.ca/simfor

Acknowledgments

SIMFOR has been developed under the direction of Fred Bunnell of the Centre for Applied Conservation Biology (now Centre for Applied Conservation Research), at the University of British Columbia. The initial design was developed by Fred Bunnell, Dave Daust and Rob McCann. The software was designed and programmed through a number of versions by Dave Cowperthwaite, Dave Daust, Mark Hafer, Dave Gizowski,, Arnold Moy, Glenn Sutherland and Ralph Wells. The development has been helped considerably by the feedback and comments of many, including Dave Byng, Reg Davis, Devon Haag, Stephanie Melles, Susan Paczek and Eric Valdal (thank you, SIMFOR "beta testers").

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History

The development of SIMFOR began in 1991 in the Center for Applied Conservation Biology, Faculty of Forestry, University of British Columbia. SIMFOR was originally developed by Fred Bunnell, Dave Daust and Rob McCann, as a research tool to facilitate asking questions about amounts and distribution of old-growth habitat that arose from the provincial government's Old Growth Strategy. Approaches to addressing the questions were encouraged by Bill Bourgeois. The original version was coded in Pascal for a DOS platform. At the outset, SIMFOR did its own harvest scheduling, but this approach was quickly recognized to be a duplication of John Nelson's (Faculty of Forestry, University of British Columbia) work with the ATLAS harvest scheduler. Subsequent development has allowed SIMFOR to respond to any spatially explicit harvest-scheduler, though it has most often been linked to ATLAS.

Over the next 4 years (1991-1994), Dave Daust redeveloped SIMFOR in QuickBasic, still utilizing a DOS platform. The original focus of the tool – to help design spatially-explicit research – was never wholly attained. However, SIMFOR was quickly able to expose unforeseen consequences of rule-based approaches to sustaining habitat. In response to requests from government agencies and industry, SIMFOR became increasingly used as a planning tool.

The arrival of the Forest Practices Code in British Columbia (1995) necessitated the use of spatially-explicit planning tools that allowed projections of impacts of forest policy and practices. In response, the redevelopment of SIMFOR in a Windows environment, with a more formal linkage to the ATLAS harvest scheduler, was initiated. The software was linked to a Microsoft Access database, and core algorithms were divided into 2 modules – Habitat and Landscape. Mark Hafer coded modules in C++. Glenn Sutherland, Dave Gizowski and Ralph Wells developed and coded the linkage with Access and a Windows interface for SIMFOR in VisualBasic. In 1998-1999, Ralph Wells worked with programmer Dave Cowperthwaite to develop a new viewer and interface, allowing the output of ASCII files from Access for use in SIMFOR modules. In 2000-2001, Wells and programmer Arnold Moy designed SIMFOR Version 3, linking SIMFOR to the ESRI Arcview 3 viewer and binary grid data format. A new interface, linked to a re-designed Access database, was coded in Visual Basic and core algorithms were coded in C.

Overview

SIMFOR Version 3.0 is a decision support tool designed to help managers and researchers evaluate the impacts of forest harvesting scenarios against landscape and habitat indicators. SIMFOR can be used to evaluate the response of forest vegetation to harvesting treatments or natural disturbance events, and to calculate projected landscape and wildlife habitat conditions.

The conceptual framework of SIMFOR habitat analysis is shown in Figure 1. A harvest scheduler, such as ATLAS, produces a list of stand units that are treated according to a specific harvesting scenario. SIMFOR combines this list of treatments with an aging routine to determine the future ages of stands (seral stages) and their expected structural values. SIMFOR can also incorporate natural disturbance events that are generated by a scheduler. Stand structure is represented by the abundance of selected habitat attributes or variables. By matching wildlife species requirements with these habitat attributes, SIMFOR estimates species-specific habitat suitability. In addition, the software uses spatial relationships to project simple landscape metrics: seral stage, patch size and edge characteristics. SIMFOR also allows projection of stand succession resulting from stand aging or harvest treatment. Finally, SIMFOR is designed to maximize model transparency. so that model components (e.g. input variables such as habitat attribute curves) can be readily observed.

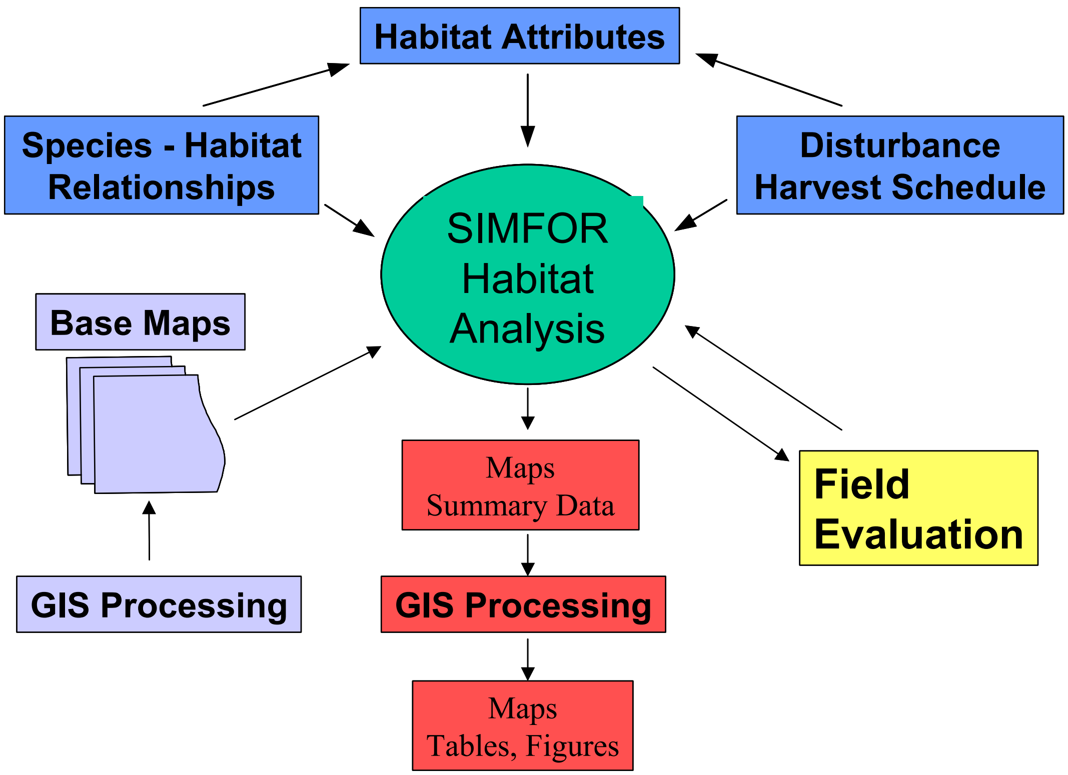


Figure 1: SIMFOR flowchart showing general classes of model inputs and outputs.

New Features in Version 3.0

- full featured expression builder
- habitat attribute input maps (static and dynamic)
- allows stand succession
- direct link to ArcView 3.x with Spatial Analyst
- stratified reporting on output maps
- many refinements

Introduction

SIMFOR uses a raster-based spatial data format (ESRI ArcInfo binary grid data format) to spatially and temporally project simple landscape parameters and wildlife habitat conditions in response to harvesting and other disturbance events. Harvest schedule and disturbance events are provided by an ASCII input file. A user interface with full data entry and editing capability links to the model database (Microsoft Access 97 or greater). The map viewer is Arcview 3.x with a "view stepping" tool designed to facilitate viewing model output. The core software module of SIMFOR is coded in pure C to provide maximum speed for model runs.

SIMFOR operates under Windows 9x, NT, 2000 and XP, and can run on fairly low-end machines effectively (e.g. 75Mhz PC with 32Mb of RAM), though performance will be affected accordingly. There are no design limitations on the size of area or number of habitat attributes that can be handled by SIMFOR during a run. We have undertaken habitat runs of moderate to high complexity on areas of more than 1 million hectares (1 hectare cell resolution); these runs took less than 5 minutes on a 600Mhz PC with 256Mb of RAM.

This user manual is primarily intended as a guide to the SIMFOR software. An overview of SIMFOR's basic functionality and design can be found on the SIMFOR web page at www.forestry.ubc.ca/simfor. Perspective users should take time to review the web content. An example project and citations of publications of SIMFOR projects can also be found on the website.

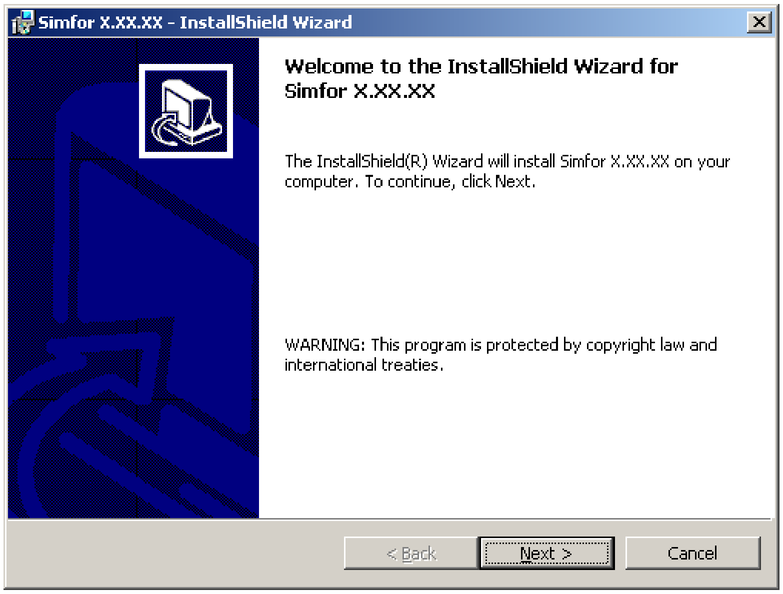
SIMFOR installs with a sample database and two example analyses (one landscape and one habitat analysis). These analyses are included at the end of the manual to assist users in learning the software. Hot links to appropriate sections of the manual are included in the example analyses and throughout the manual (text in blue font).

Installation

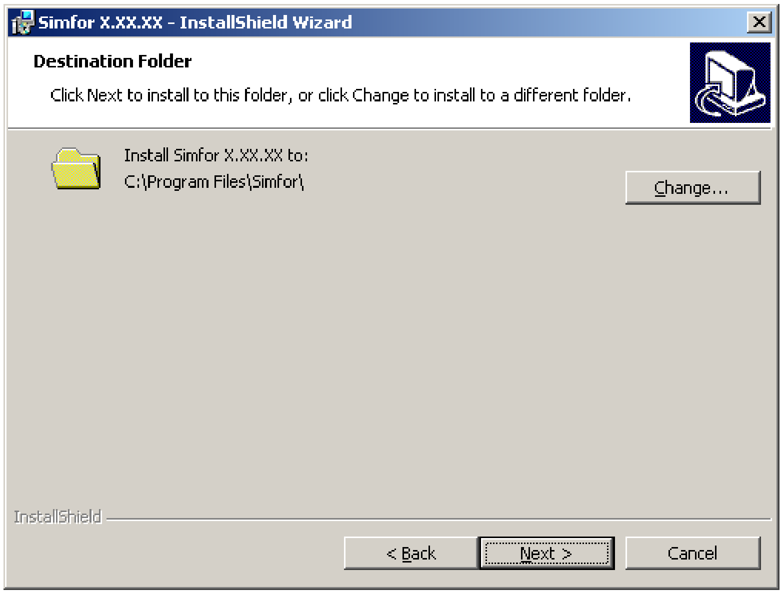
SIMFOR uses the ESRI GRID IO library to read and write ESRI GRID coverages. ArcView 3.x or greater must be installed to enable this functionality.

To install SIMFOR complete the following instructions.

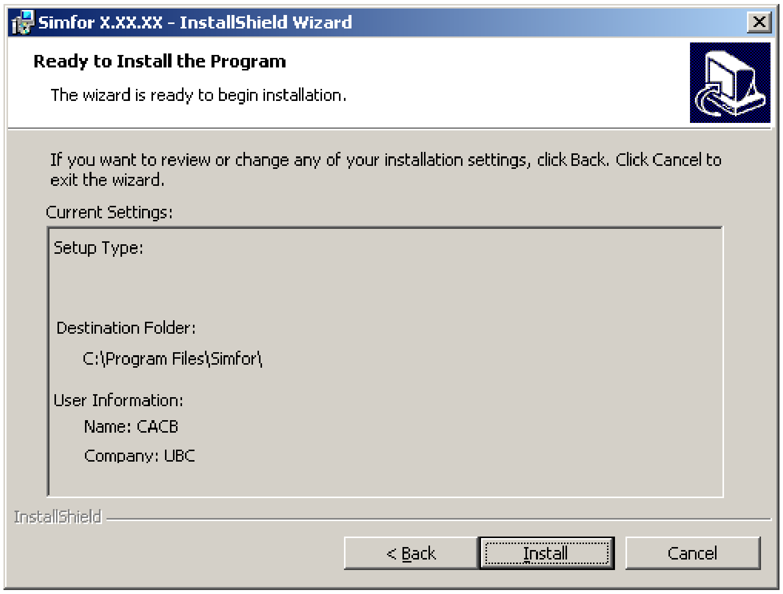
1) Locate the executable SIMFORXXXXX.exe (where XXXXX is the version number).
2) Double-click on the file to start the installer.



3) Select the installation directory and then press **[Next]**.



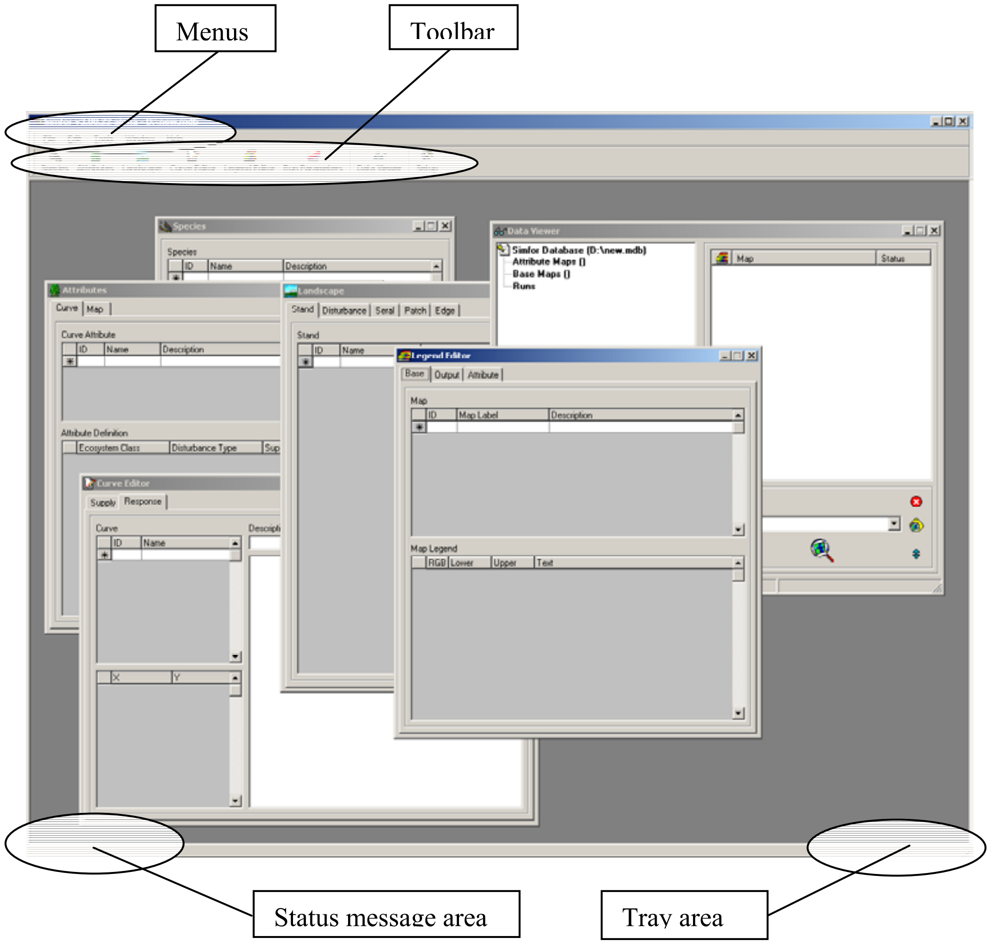
4) Press **[Install]** and wait for the installer to finish.



5) After the install has completed, you will be asked to reboot the computer.
6) SIMFOR uses ActiveX Data Objects (ADO), which requires the MS Data Access Components to be installed. Some operating systems like Windows 2000 will already include the Data Access Components. If you see the following dialog box while trying to open a database, you will need to install the components.

The latest RTM release of the MS Data Access Components can be found in the Downloads section of the Microsoft Universal Data Access home page at http://www.microsoft.com/data/.

Interface



The interface is a multi-document interface or MDI. The main MDI form has a menu, toolbar, status message area, and tray area. All opened forms are contained within the main MDI form with the exception of the View Stepper.

Menu

File

New – creates a new blank database
Open – open existing database
Save As – save the current database as another database
Close – close current database
Exit – exit program

Edit

Setup – settings for map directories, ArcView, Data Viewer and programs

Tools

Data Viewer – opens the Data Viewer
View Stepper – opens the View Stepper
Curve Calculator – opens the Curve Calculator
Map Diagnostics – opens the Map Diagnostics tool

Window

Arrange – not implemented yet

Help

About – splash screen for credits and other information

Toolbar

Species – opens the Species form
Attributes – opens the Attributes form
Landscape – opens the Landscape form
Curve Editor – opens the Curve Editor form
Legend Editor – opens the Legend Editor form
Run Parameters – opens the Run Parameters form
Data Viewer – opens the Data Viewer
Setup – opens the Setup form

Status message area

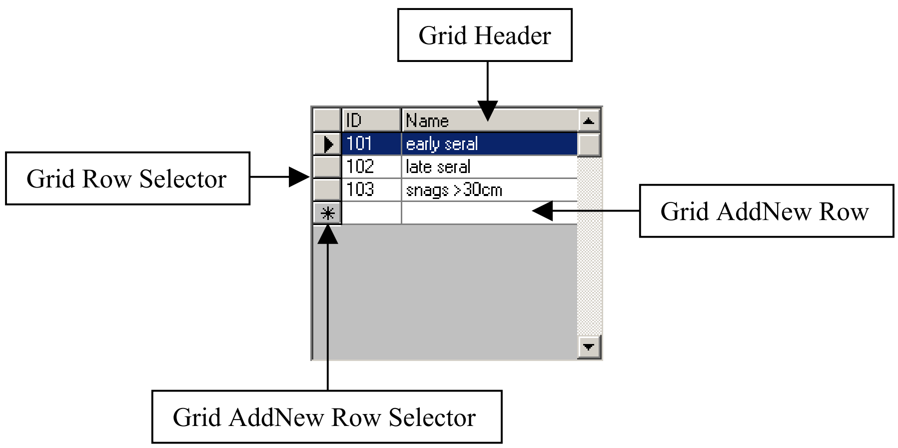
- application messages will appear

Tray area

- forms that are minimized will appear as icons in this section

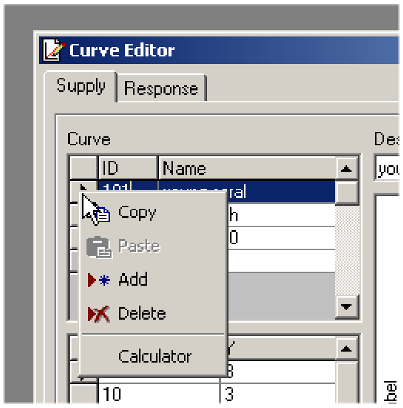
Using the Grid Control

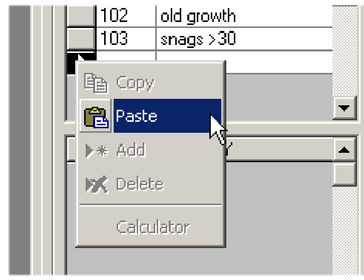
Here is a list of terminology used to describe the different parts of a Grid control.



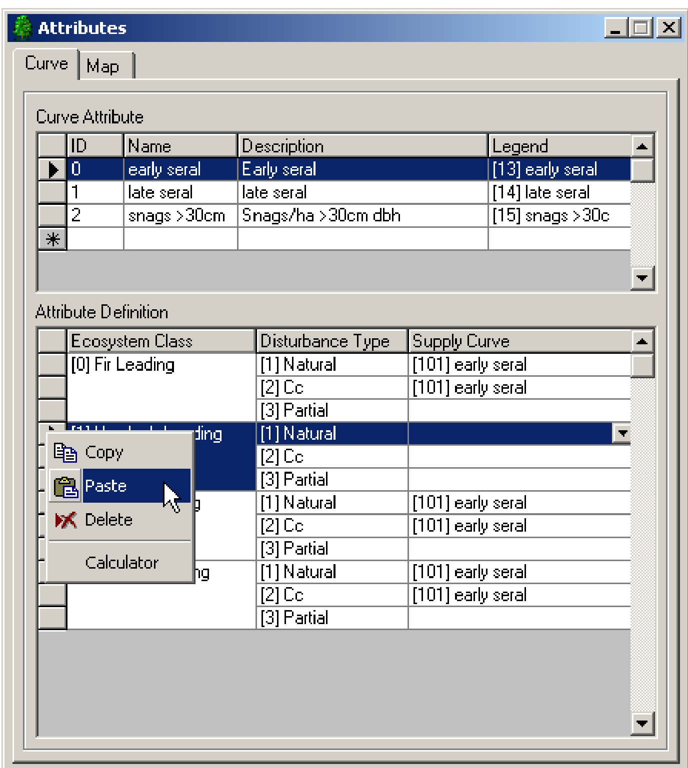
Grid Header – the header usually contains the name of the data column
Grid Row Selector – selects the row when clicked on
Grid AddNew Row – the row in which new data is added
Grid AddNew Row Selector – selects the AddNew Row when clicked on

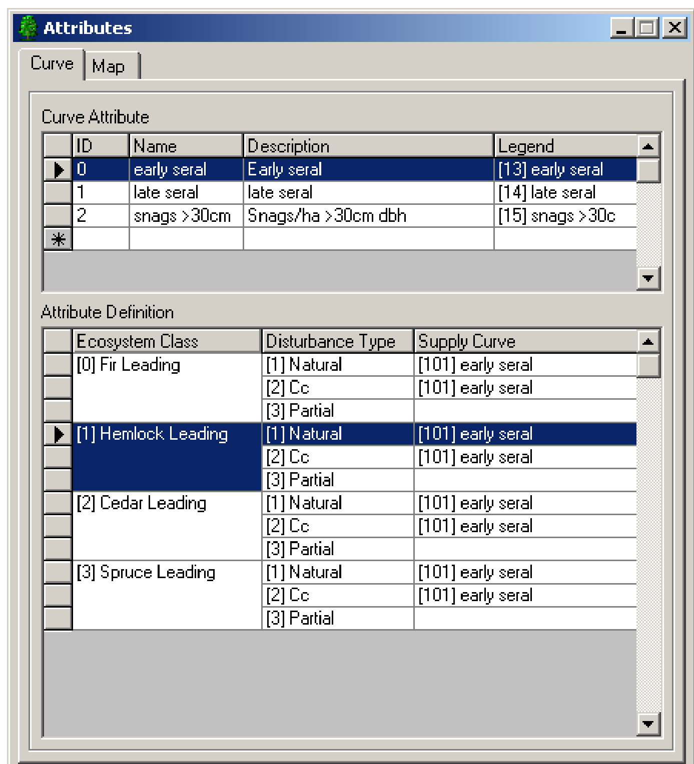
Most forms that contain a grid control share a common methodology for performing editing operations.





Editing functions are available in the context menu by right-clicking the mouse on the grid control row selector. By holding down the shift key while clicking on a row, records can be selected and the appropriate context menu function can be applied. Pasting new records can done in one of two ways: (1) right-clicking the mouse on the AddNew row selector (row selector with ✱ icon) and selecting the paste function on the context menu, or (2) left-clicking the mouse on the AddNew row selector and using the shortcut key combination (ctrl-v). When the AddNew row is selected, the icon will change from ✱ to ▶ . The source data for pasting must be tab delimited between each field value.





Where there is no AddNew row selector, the editing functions operate the same way with the exception of where the pasting begins. The above example shows what happens when two new records are pasted in the Attribute Definition section on the Attributes form.

Base maps

SIMFOR requires five maps to establish the initial state of the landscape; these base maps must be present before any runs can be performed. The five base maps are AGE, DISTURBANCE, STAND, BLOCK, and CALC. All maps must be ARC/INFO binary GRIDs and must share the same spatial extent and data area (see Map Diagnostics Tool). Also, the maps must be located in the same directory to be properly referenced by the program. See the Setup section and Run Options section for more information on setting up the base maps.

AGE

This map is used to set the initial age of each raster cell in the landscape. The cell age value is used to (1) determine the supply of a curve-based attribute, (2) determine when a disturbance event occurs in the schedule file, and (3) determine the appropriate seral stage. Age values change for each run period and/or can be modified by a disturbance event in the schedule file.

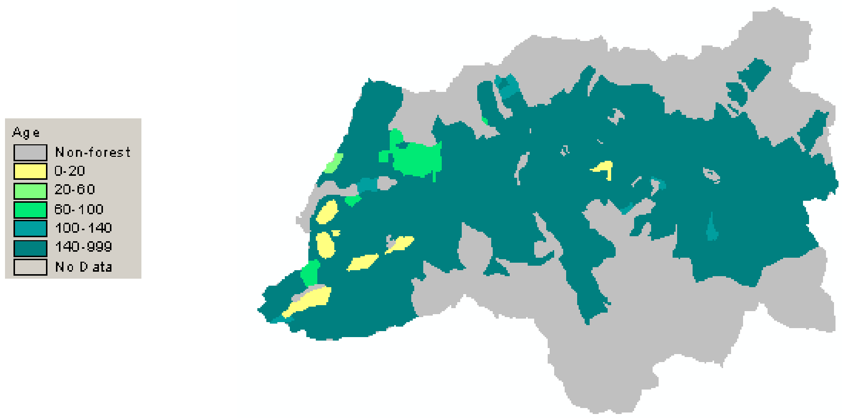


Figure 2: Example of an age map.

DISTURBANCE

This map is used to set the disturbance type for each raster cell in the landscape at the time of run initiation. Subsequent disturbances are introduced by the schedule.out file (see Schedule File). The disturbance type cell value is used in conjunction with the stand type cell value to determine the appropriate supply curve required to calculate the supply of an attribute. Disturbance type values will change when another disturbance type is applied to the same cell during the simulation.

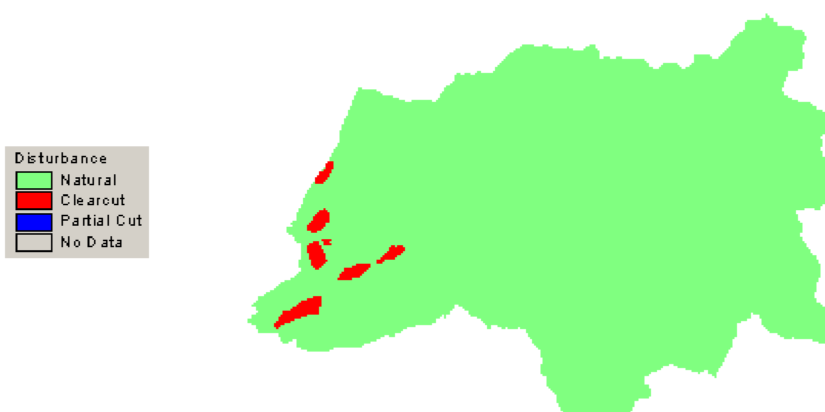


Figure 3: Example of a DISTURBANCE map.

STAND

This map is used to set the most recent stand type for each cell in the landscape. The stand type cell value is used in conjunction with the disturbance type cell value to determine the supply curve required to calculate the supply of an attribute. Stand type values can change through *scheduled succession* or *natural succession*. *Scheduled succession* occurs at the time of a scheduled disturbance event in the schedule file. *Natural succession* occurs when a defined age threshold is exceeded.

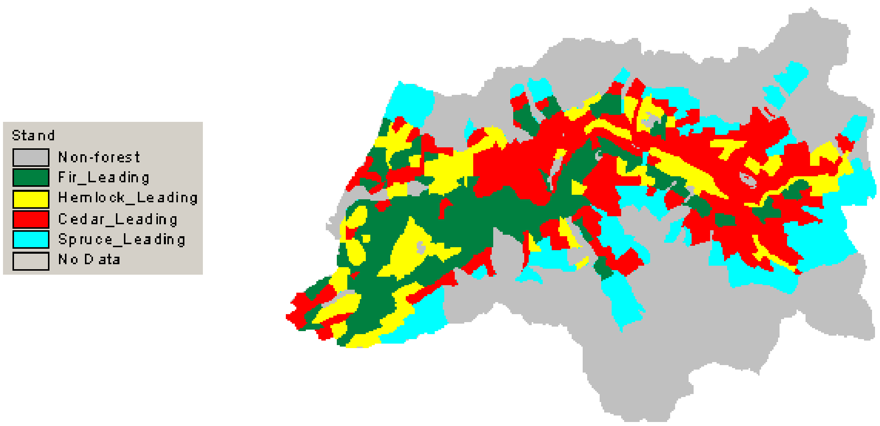


Figure 4: Example of a STAND map.

BLOCK

This map is used to set the block ID for each cell in the landscape. A block is the area to which a disturbance type is applied, as determined by the schedule file (see Schedule File). The block map is static and does not change values throughout the simulation.

Figure 5: Example of a BLOCK map.

CALC
This map is used to establish whether or not a calculation is to be performed on a particular cell. Using binary values, the map defines the portions of the landscape that are to be analyzed. A calc cell value of 1 means a calculation will occur. A cell value of 0 means a calculation will not occur. The calc map is static and does not change values throughout the simulation.

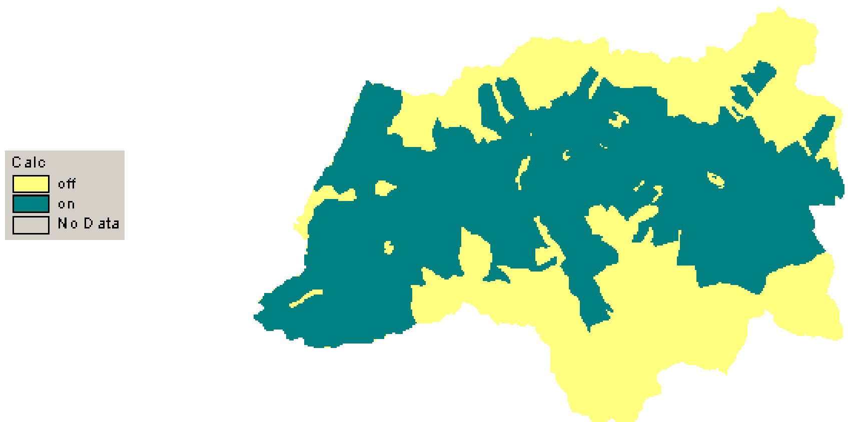
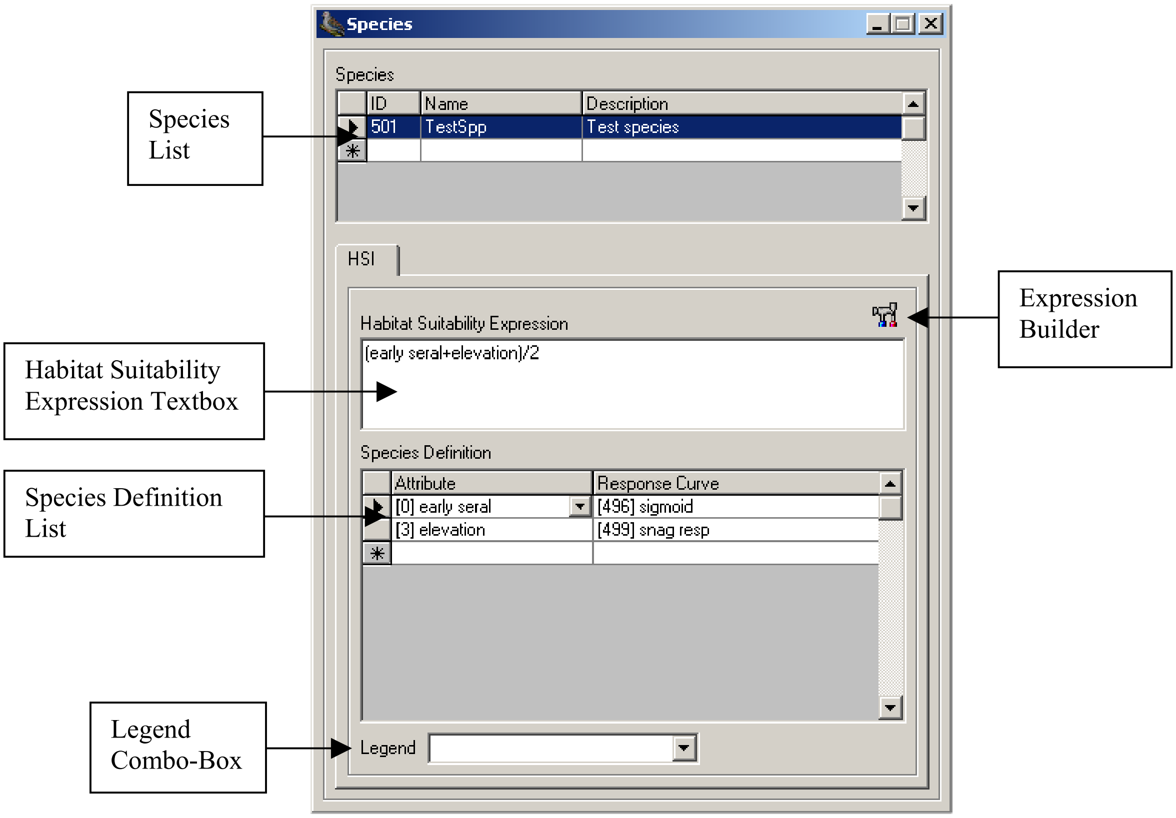
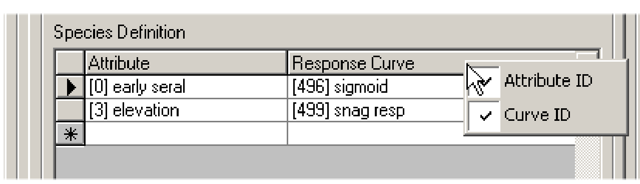


Figure 6: Example of a CALC map.

Species



The **Species** form is used to define the vertebrate species to be modeled. Each species must have a *species definition* and a *habitat suitability expression*. To add a new species, enter a unique ID, name and description in the **Species List**. Next, select attributes and response curves to create a species definition for the model. Attributes and response curves are selected either by (1) using the drop-down, or (2) directly entering the ID value in the appropriate **Species Definition List** column. For more information on attributes and response curves, see the Attributes and section. After creating the species definition, build a habitat suitability expression either by (1) using the Expression builder, or (2) directly entering and editing the equation within the **Habitat Suitability Expression Textbox**. A legend can be assigned to each species by selecting a legend from the **Legend Combo-box**. For more information on legends, see the Legend Editor section.

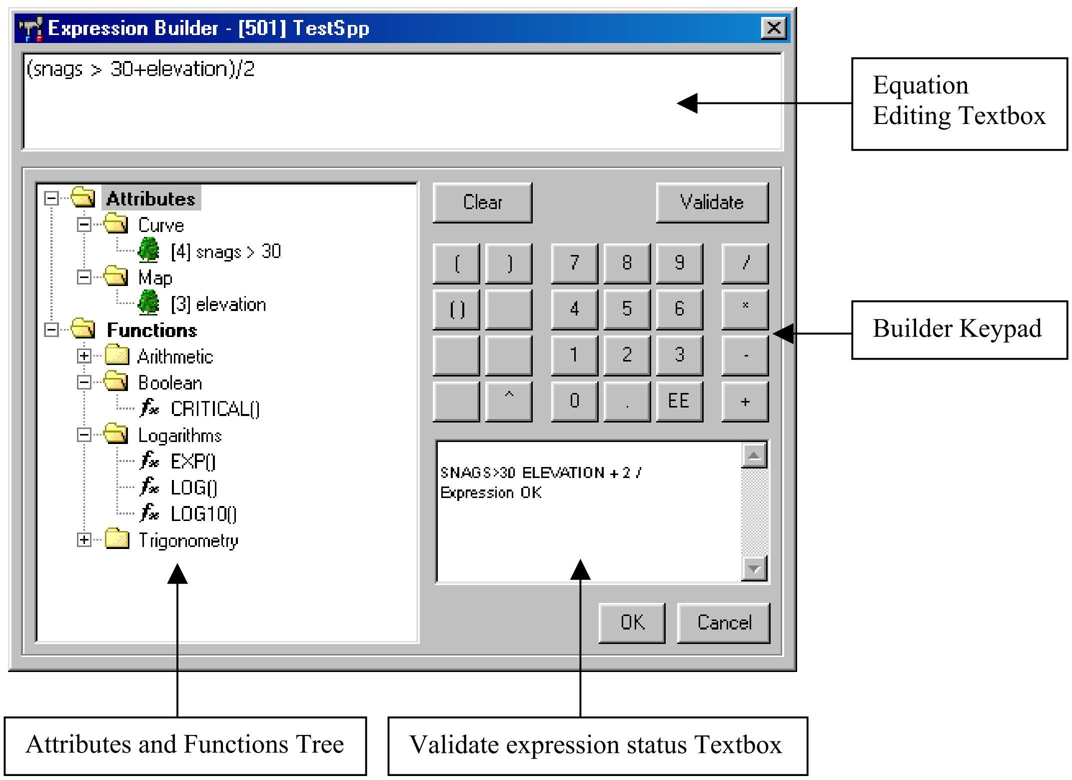


The IDs of the Attribute or Response curve can be toggled on or off by right-clicking on the Species Definition data grid header and selecting the appropriate option to toggle.

When a request is made to produce habitat suitability maps for a species, the values in the output habitat suitability map will be dependent on the species habitat suitability expression. To produce a legend for species habitat maps, first set the map label and then set the lower and upper map legend bounds for each suitability class. Then associate the legend for the species as explained in the above paragraph. See the Legend Editor section for more information on legends. Also, see Habitat in the Run Parameters section for more information on how to create output habitat suitability maps.

An area summary table can be created for habitat suitability maps by using the area reporting script “S4_area stats” in ArcView. Ensure that the habitat suitability legend is setup correctly as the reporting script will use the legend to determine the total area for each suitability class. See the avenue script “S4_area stats” in the ArcView Reporting Scripts section for more information.

Expression builder



The **Expression Builder** form is used to create a mathematical expression that calculates habitat suitability through the combination of individual attributes and mathematical functions. The form has several key features - an **Equation Editing Textbox**, an **Attributes** and **Functions Tree**, a **Validate Expression Status Textbox** and the **Builder Keypad**. The **Attributes Tree** node is broken down into curve and map attributes. As the contents of the **Attributes Tree** are linked to the species definition, ensure that all the attributes to be used in the expression are defined in the Species Definition List. The **Functions Tree** node contains supported functions that can be used to build an equation.

To create an equation, select the appropriate attributes and functions by double clicking on the nodes, then use the **Builder Keypad** to add operators and brackets. To check for errors in the equation, use the **Validate** button. The validated equation will appear in the **Validate Expression Status Textbox** located just below the **Builder Keypad**. The **Validate Expression Status Textbox** displays the Reverse Polish Notation (RPN) form of the equation and will help debug any problems with the equation. It is especially helpful when resolving precedence and bracket issues. Once the equation has been validated, click **OK** to return to the **Species** form; the equation will appear in the **Habitat Suitability Expression textbox**.

The following is a list of supported functions that can be used in an expression:

Functions

Arithmetic

ABS() – computes the absolute value of its numeric argument
CEIL() – computes an integer value equal to the greatest integer less than or equal to its numeric argument
FLOOR() - computes an integer value equal to the greatest integer less than or equal to its numeric argument
NEG() – reverses the sign of its numeric argument
SQR() – computes the square of its numeric argument
SQRT() – computes the square root of its numeric argument

Boolean

CRITICAL() – returns 0 for values of 0 and all other values return 1. Mainly used in setting critical habitat elements.

Logarithms

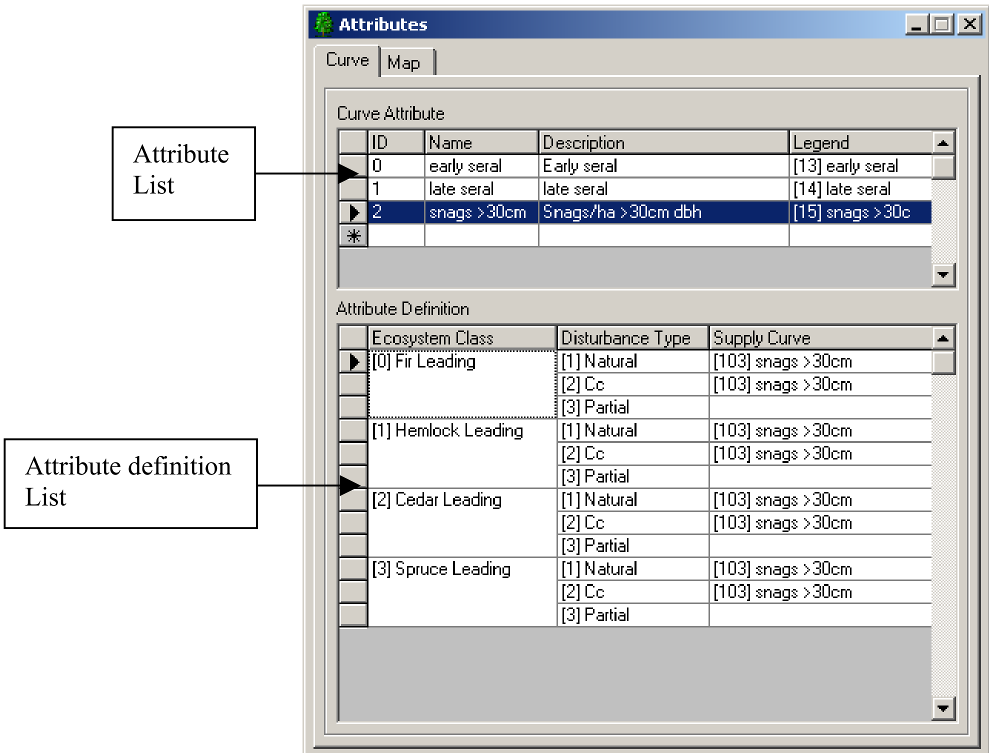
EXP() - computes *e* to the power of its numeric argument
LOG() - computes the natural logarithm of its numeric argument
LOG10() – computes the common logarithm (base 10) of its numeric argument

Trigonometry

ACOS() - computes the arccosine of its numeric argument
ASIN() - computes the arcsine of its numeric argument
ATAN() - computes the arctangent of its numeric argument
COS() - computes the cosine of its numeric argument(in radians)
SIN() - computes the sine of its numeric argument(in radians)
TAN() - computes the tangent of its numeric argument(in radians)

Attributes

Curve

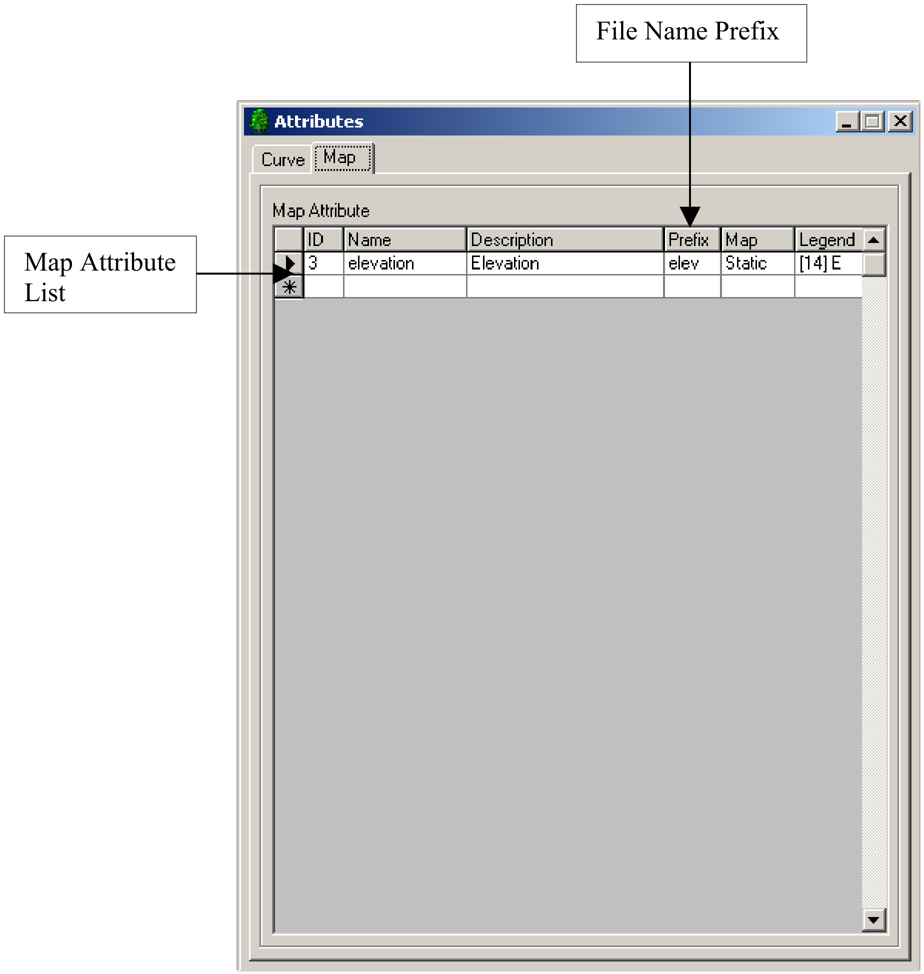


The **Attributes** form is divided into 2 sections: *curve*- and *map-based* attributes. To add a new *curve-based* attribute, first enter a unique ID, name and description in the **Curve Attribute List**. Second, create an attribute definition by assigning the appropriate supply curve to the different Ecosystem/Disturbance type combinations that occur in the **Attribute Definition List**. The supply curve can be assigned either by (1) selection from the combo-box, or (2) direct entry of the correct supply curve ID into the Supply Curve column. A legend can then be assigned to each attribute in the **Curve Attribute List** either by (1) selecting a legend from the combo-box, or (2) entering the ID directly into the Legend column. For more information on legends, see the Legend Editor section.

When a request is made to produce output curve based attribute maps, the values in the output attribute map will be dependent on the Attribute definition. To produce a legend for attribute maps, first set the map label and then set the lower and upper map legend bounds for each attribute class. Then associate the legend for the attribute as explained in the above paragraph. See the Legend Editor section for more information on legends. Also, see Attribute in the Run Parameters section for more information on how to create output attribute maps

An area summary table can be created for curve based attribute maps by using the area reporting script “S4_area stats” in ArcView. Ensure that the attribute legend is setup correctly as the reporting script will use the legend to determine the total area for each attribute class. See the avenue script “S4_area stats” in the ArcView Reporting Scripts section for more information.

Map



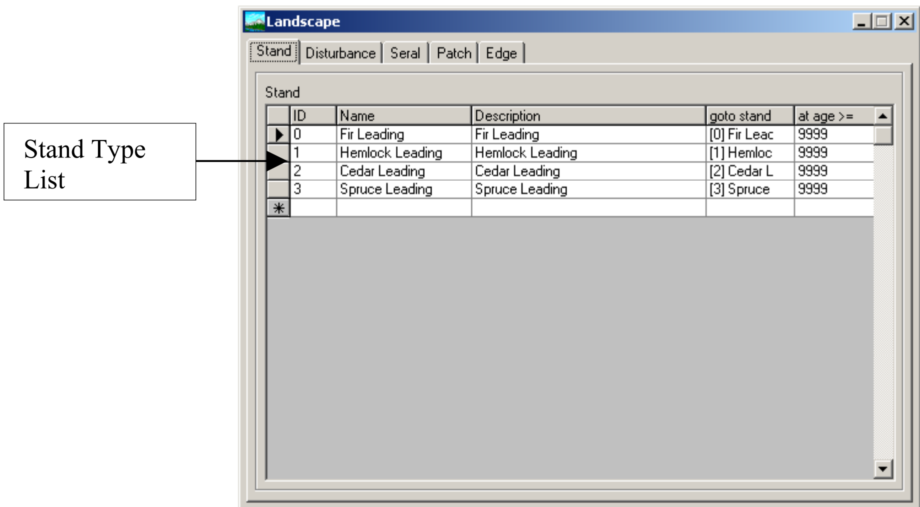
Map attributes are file-based and are referenced using a file name prefix. Map attributes can be either static or dynamic. In the case of static maps, the prefix is the same as the file name. For example, the prefix for an elevation map named 'elev' is 'elev'. In the case of dynamic attribute maps, the prefix is the file name excluding the year designation. For example, the prefix for the series of dynamic map attributes attrib001, attrib010, attrib050 is 'attrib'. For attribute maps to be properly referenced, they must reside in the same directory. The correct directory for map attributes is the **Attribute Maps Directory**, found in the **Map Directories** tab on the Setup form. See the Setup section for more information.

To add a new *map-based* attribute, enter a unique ID, name and description in the **Map Attribute List**. Reference the correct file using the appropriate file name prefix. An attribute legend can also be assigned either by (1) selecting the legend from the combo-box, or (2) entering the ID directly in the Legend column. For more information on legends, see the Legend Editor section.

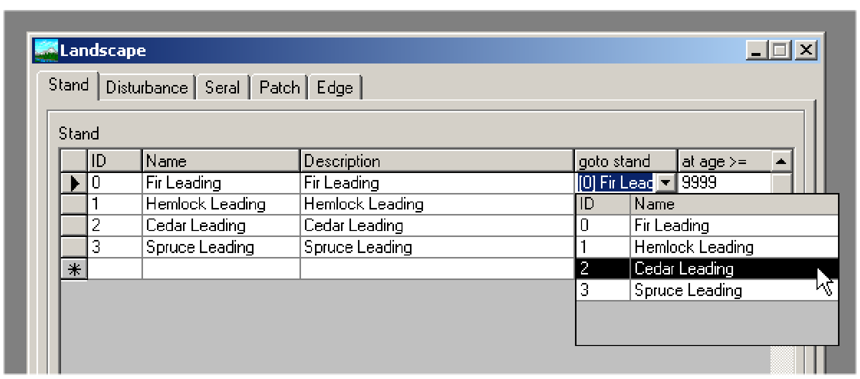
Landscape

The **Landscape** form contains stand, disturbance type, seral, patch and edge parameters.   These parameters must be defined prior to conducting any landscape-level or habitat analyses.

Stand



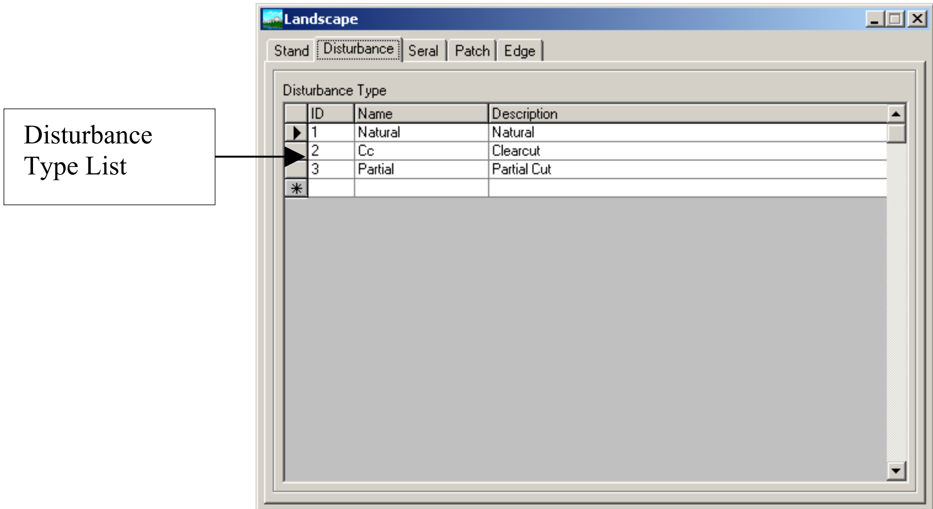
The different stands to be included in the model are entered in this list. The **Stand ID** must correspond to the values that are contained in the base stand map.



Stand succession can be modeled by specifying a **goto stand** and a **succession age.** The **goto stand** can be defined either by (1) selecting it from the drop-down, or (2) entering it directly. If stand succession is not desired, ensure that both the stand name and the goto stand are the same; alternatively, define a succession age greater than what can be modeled (e.g. 9999 years). When the ID or name of an existing stand is altered, the changes are simultaneously updated in all related forms that contain the stand.

When a request is made to produce output stand maps, the values in the output stand map will be dependent on the occurrence of any succession events, otherwise the stand map values will remain the same from one run year to the next.   To produce a legend for stand maps, first set the map label as STAND and then set the lower and upper map legend bounds using the **Stand Type List** ID values. The stand legend can also be generated automatically using the auto-fill function in the Legend Editor. The auto-fill feature will use the ID and Name values from the **Stand Type List** to produce the legend. See the Legend Editor section for more information on legends. Also, see Landscape in the Run Parameters section for more information on how to create output stand maps.

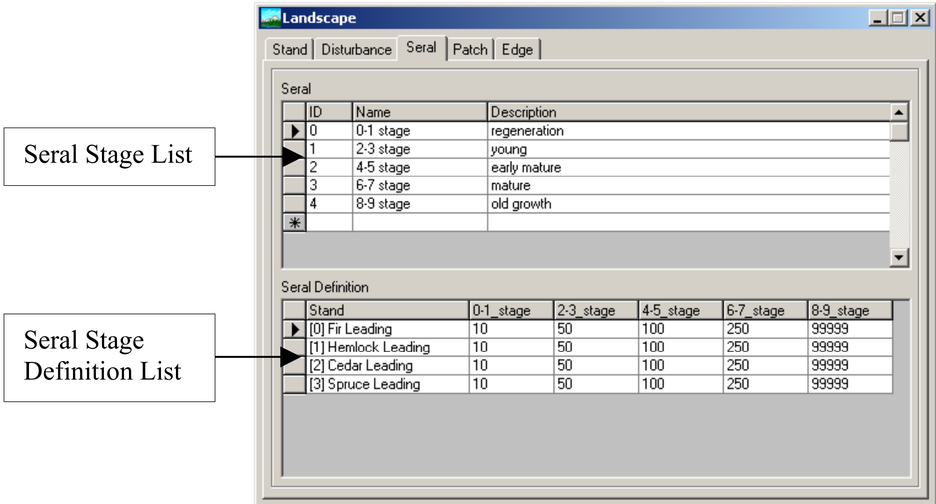
Disturbance



Disturbance includes the scheduled harvest events or natural disturbance events that are to occur on the landscape. The different disturbance types to be included in the model are entered in the **Disturbance Type List**. The ID of each disturbance must correspond to the values found in the disturbance type basemap and harvest schedule file. When the ID or name of an existing disturbance type is altered, the changes are simultaneously updated in all related forms that contain the disturbance.

When a request is made to produce output disturbance maps, the values in the output disturbance map will be dependent on the disturbance type set by the harvest schedule file (see Schedule File), otherwise the disturbance map values will remain the same from one run year to the next. To produce a legend for disturbance maps, first set the map label as DISTURBANCE and then set the lower and upper map legend bounds using the **Disturbance Type List** ID values. The disturbance legend can also be generated automatically using the auto-fill function in the Legend Editor. The auto-fill feature will use the ID and Name values from the **Disturbance Type List** to produce the legend. See the Legend Editor section for more information on legends. Also, see Landscape in the Run Parameters section for more information on how to create output disturbance maps.

Seral

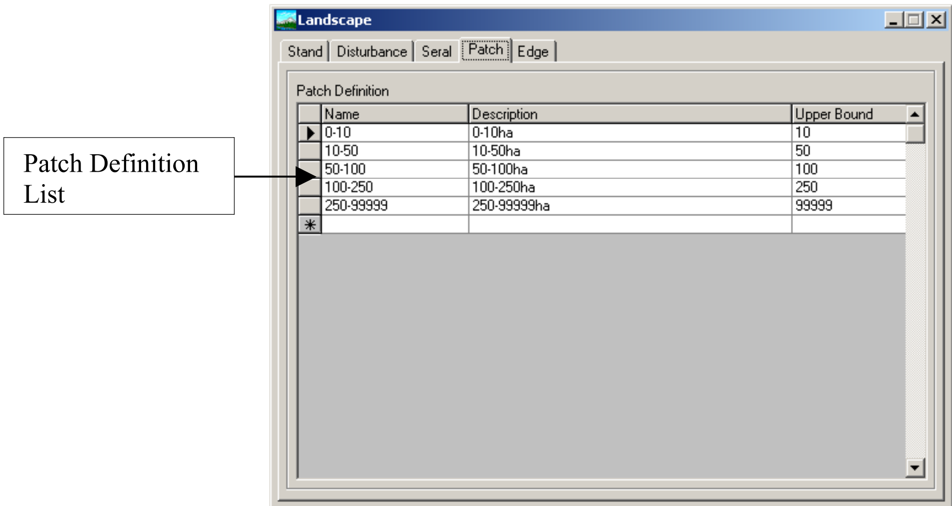


Seral definitions are used for calculating different landscape statistics, including the distribution of seral stages, seral patches and seral edges. User-defined seral stages are entered in the **Seral Stage List**. In the **Seral Definition List**, an upper age limit can be set to define the seral stage of each stand type.

When a request is made to produce output seral maps, the values in the output seral map will contain Seral stages that are identified by the **Seral Stage List** Seral ID values. To produce a legend for seral maps, first set the map label as SERAL and then set the lower and upper map legend bounds using the **Seral Stage List** ID values. The seral legend can also be generated automatically using the auto-fill function in the Legend Editor. The auto-fill feature will use the ID and Name values from the **Seral Stage List** to produce the legend. See the Legend Editor section for more information on legends. Also, see Landscape in the Run Parameters section for more information on how to create output seral maps.

An area summary table can be created for seral maps by using the area reporting script “S4_area stats” in ArcView. Ensure that the seral legend is setup correctly as the reporting script will use the legend to determine the total area for each seral class. See the avenue script “S4_area stats” in the ArcView Reporting Scripts section for more information.

Patch

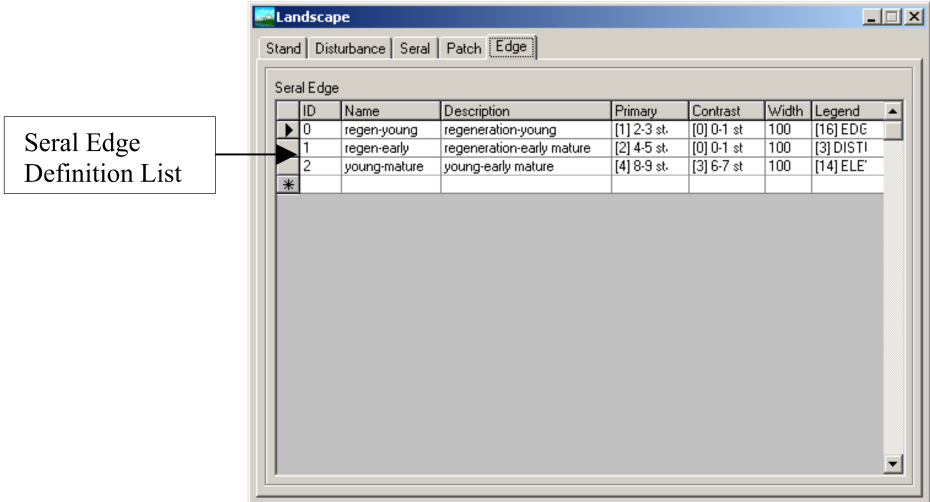


Patches are defined as clusters of cells that share the same seral stage and are contiguously connected in eight directions. This feature allows the user to analyze the distribution of patch sizes across the landscape that results from a given schedule of harvesting activity. Patch size classes are defined by the user in this table. Users should note that values from this table are here for documentation purposes, and are not directly used in the patch analysis algorithm. Rather, this table is used to setup a patch legend using the legend auto-fill as explained in the next section. Patch sizes are defined by entering the upper limit values (in hectares) for each size class in the **Patch Definition List**. Descriptions can either be numeric (e.g. 0-10ha) or text (e.g. very small).

When a request is made to produce output patch maps, the values in the output patch map represent the area of a patch in hectares. To produce a legend for patch maps, first set the map label as SERAL_PATCH and then set the lower and upper map legend bounds identifying the patch sizes. The patch legend can also be generated automatically using the auto-fill function in the Legend Editor. The auto-fill feature will use the Upper Bound and Name values from the **Patch Definition List** to produce the legend. See the Legend Editor section for more information on legends. Also, see Landscape in the Run Parameters section for more information on how to create output patch maps.

An area summary table can be created for patch maps by using the area reporting script "S4_area stats" in ArcView. Ensure that the patch legend is setup correctly as the reporting script will use the legend to determine the total area for each given patch size range. See the avenue script "S4_area stats" in the ArcView Reporting Scripts section for more information. Also, patches can be summarized by seral stages but seral maps must be used in this case. See Seral in the Landscape section for more information on seral reporting.

Edge

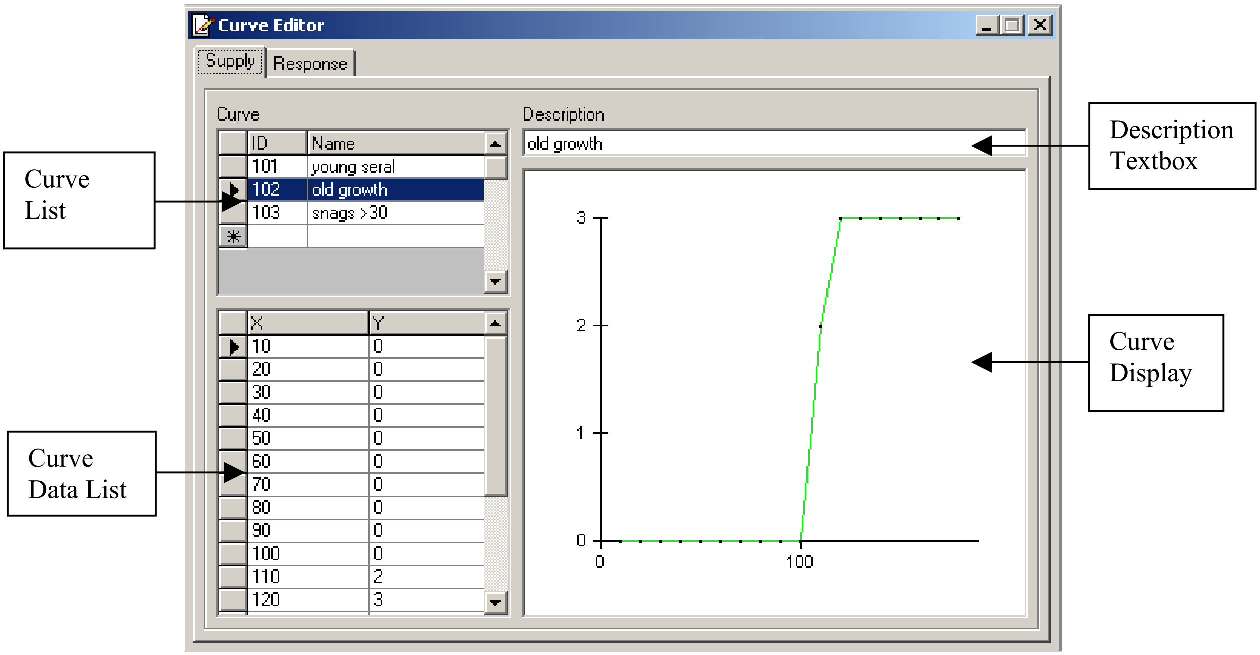


Edge class definitions are used to estimate the location and area of different edge/interior habitat types across a landscape. An edge is defined according to 3 parameters: "primary" age, "contrast" age and edge width. The primary age determines the lower age bound of cells (primary cells) on the "interior" side of an edge. The contrast age determines the upper age bound of cells (contrast cells) on the outside of an edge. Thus, a given edge type occurs wherever a primary cell lies adjacent to a contrast cell. The edge width is the distance that edge effects extend into the patch, and is defined size units. Edge types, age bounds and edge widths are entered in the **Seral Edge Definition List**.

When a request is made to produce output edge maps, the 3 output edge map values are: 0=not edge, 1=edge, 2=interior. To produce a legend for edge maps, first set the map label as SERAL_EDGE and then set the lower and upper map legend bounds identifying the three edge values: 0,1,2. The edge legend can also be generated automatically using the auto-fill function in the Legend Editor. See the Legend Editor section for more information on legends. Also, see Landscape in the Run Parameters section for more information on how to create output edge maps.

An area summary table can be created for edge maps by using the area reporting script "S4_area stats" in ArcView. Ensure that the edge legend is setup correctly as the reporting script will use the legend to determine the total area for edge class. See the avenue script "S4_area stats" in the ArcView Reporting Scripts section for more information.

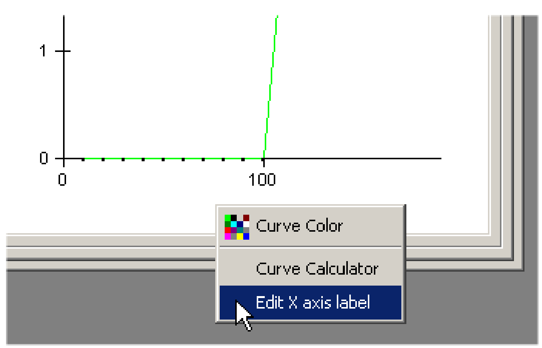
Curve Editor



Supply curves describe the change in quantity of a given attribute (habitat component) over time, with time on the x-axis and attribute abundance on the y-axis. Response curves describe the response of a species to those changes in attribute supply, with attribute abundance on the x-axis and an index of habitat suitability on the y-axis. See the Attributes section and the Species section for more information on supply and response curves.

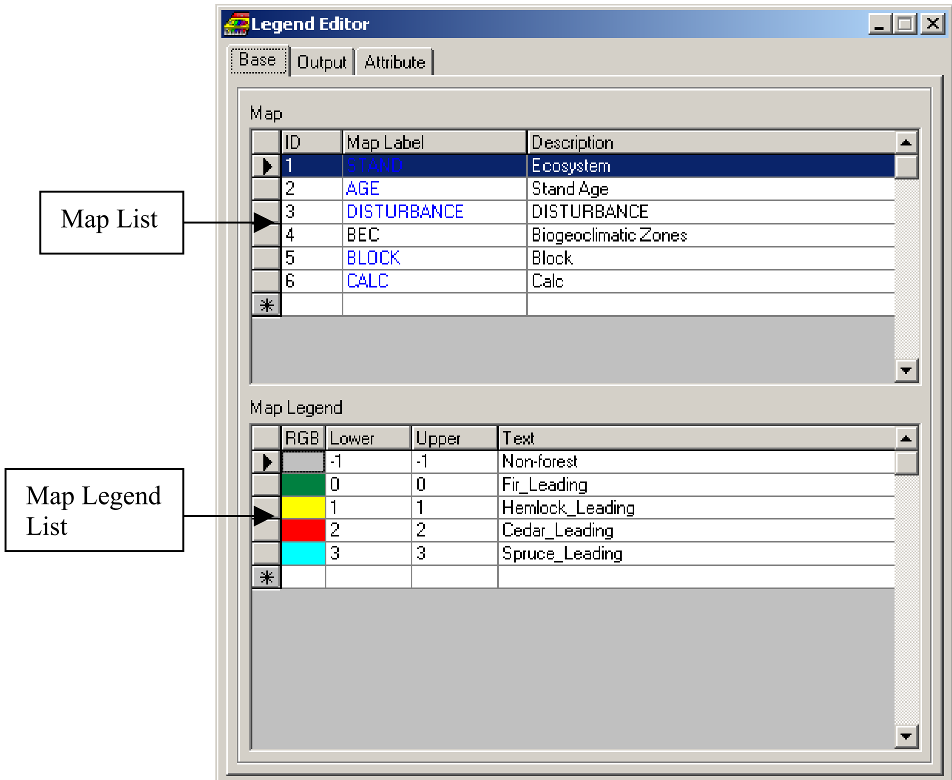
Supply and response curves are defined and edited within the **Curve Editor**. To add a new curve, select the appropriate curve tab (supply or response) then enter an ID in the **Curve List**, followed by a name and a description. Enter the X and Y values for the corresponding curve in the **Curve Data List**.

When the ID or name of an existing curve is altered, the changes are simultaneously updated in all related forms containing that curve. Changes to the ID or name of a supply curve will be reflected in the Attribute Definition List on the Attributes form. Similarly, changes to the name or ID of a response curve will be reflected in the Species Definition List on the Species form.

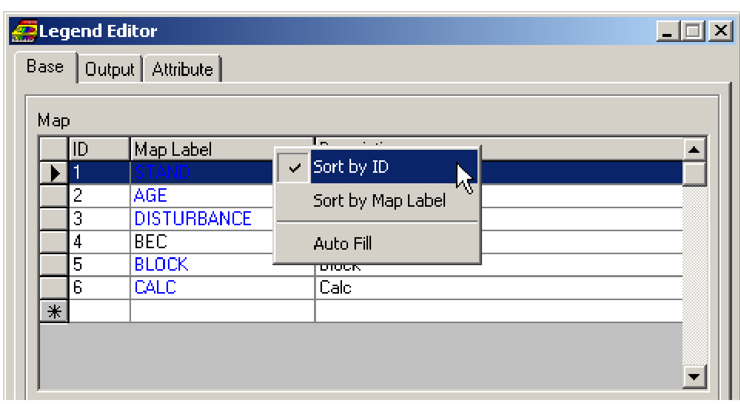


Axis labels can be added/edited by using the context menu (right-click) or by double-clicking on the appropriate axis within the **Curve Display** area. Curve colors can be changed by selecting the Curve Color option from the context menu (right-click) and picking a color from the Color Palette.

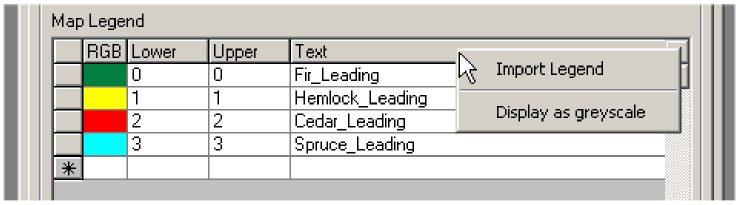
Legend Editor



Map legends, used when displaying maps in ArcView, are created and edited within the **Legend Editor**. To add a legend, select the appropriate map tab (base, output or attribute) then enter an ID in the **Map List**, followed by a map label and a description. Use the **Map Legend List** to enter the lower/upper bound and text for each legend class. To change the color of a legend class, double-click on the RGB value and choose a color from the Color Palette. When the ID or name of an existing map legend is altered, the changes are simultaneously updated in all related forms that contain the legend. To effectively use the legends with ArcView, ensure that you have read the section below: "**The data viewer uses the following criteria to determine how a map legend is assigned to a particular map**"



Maps can be sorted, either by ID or Map Label, by right-clicking on the Map Label header in the **Map List** and selecting the appropriate '**Sort By**' context menu item. The 'Auto Fill' context menu item can be used to automatically fill in the map legend with any missing core maps. Core maps have reserved Map Label names (AGE, BLOCK, CALC, DISTURBANCE, STAND, SERAL, SERAL_PATCH, SERAL_EDGE) and are highlighted in blue. These reserved Map Label names are required to link the appropriate map to the correct legend..



ArcView legend files can be imported, by right-clicking on the Map Legend header in the **Map Legend List** and selecting the '**Import Legend**' context menu item. To display the legends in greyscale, use the '**Display as greyscale**' context menu item.

The data viewer uses the following criteria to determine how a map legend is assigned to a particular map:

The map name is parsed and the following logic is used to link the map with the appropriate legend:

- If the map prefix is "**at**" and the proceeding 3 characters constitute a numeric code, the number is used to search for the matching AttributeID in the Attribute table. The MapInfo legend associated with the matching record is selected.

- If the map prefix is "**hs**" and the proceeding 3 characters constitute a numeric code, the number is used to search for the matching SpeciesID in the Species table. The MapInfo legend associated with the matching record is selected.

- If the map prefix is "**ss**", the MapInfo table is searched for the reserved MapLabel "SERAL". The SERAL legend is selected.

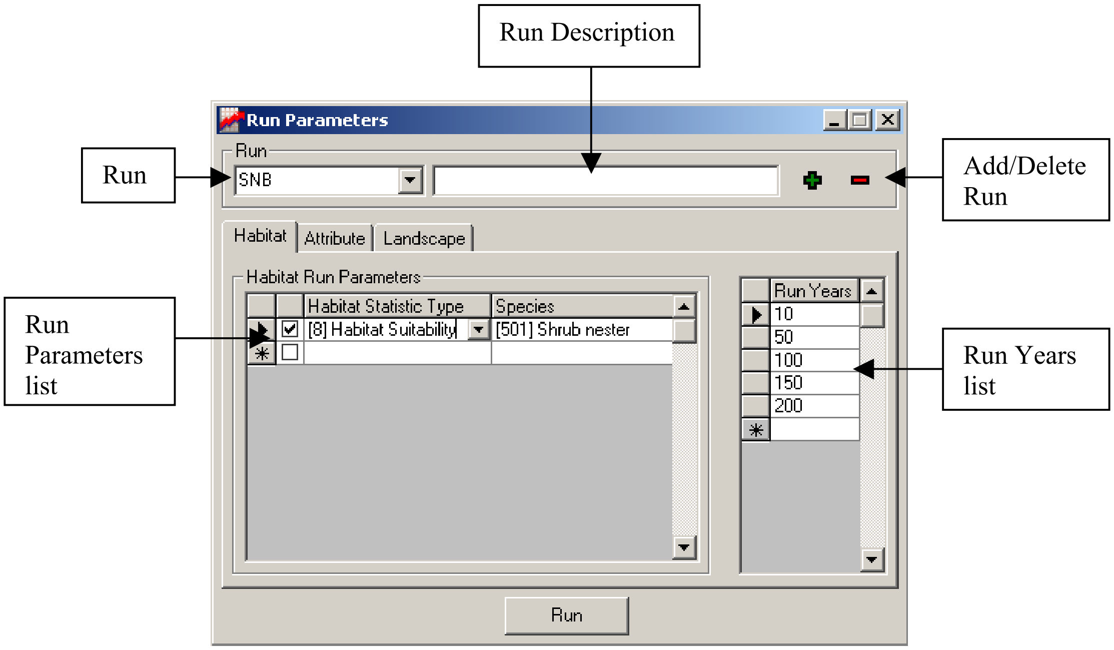
- If the map prefix is "**sp**", the MapInfo table is searched for the reserved MapLabel "SERAL_PATCH". The SERAL_PATCH legend is selected.

- If the map prefix is "**se**", the MapInfo table is searched for the reserved MapLabel "SERAL_EDGE". The SERAL_EDGE legend is selected.

- If the map name is **AGE**, **BLOCK**, **CALC, DISTURBANCE** or **STAND**, the MapInfo table is searched for the matching reserved MapLabel name (AGE, BLOCK, CALC, DISTURBANCE, STAND), and the appropriate legend is selected.

For all other maps, name matching is used to determine the appropriate legend. The legend for whatever MapLabel (or portion thereof) that matches the map name will be selected.

Run Parameters



The **Run Parameters** form is used to set up habitat, attribute and landscape level analyses for a set of defined periods.

Habitat
Select the 'Habitat Suitability' option from the Habitat Statistic Type column, then select the appropriate species from the Species column.

Habitat Statistic Type
[8] Habitat Suitability

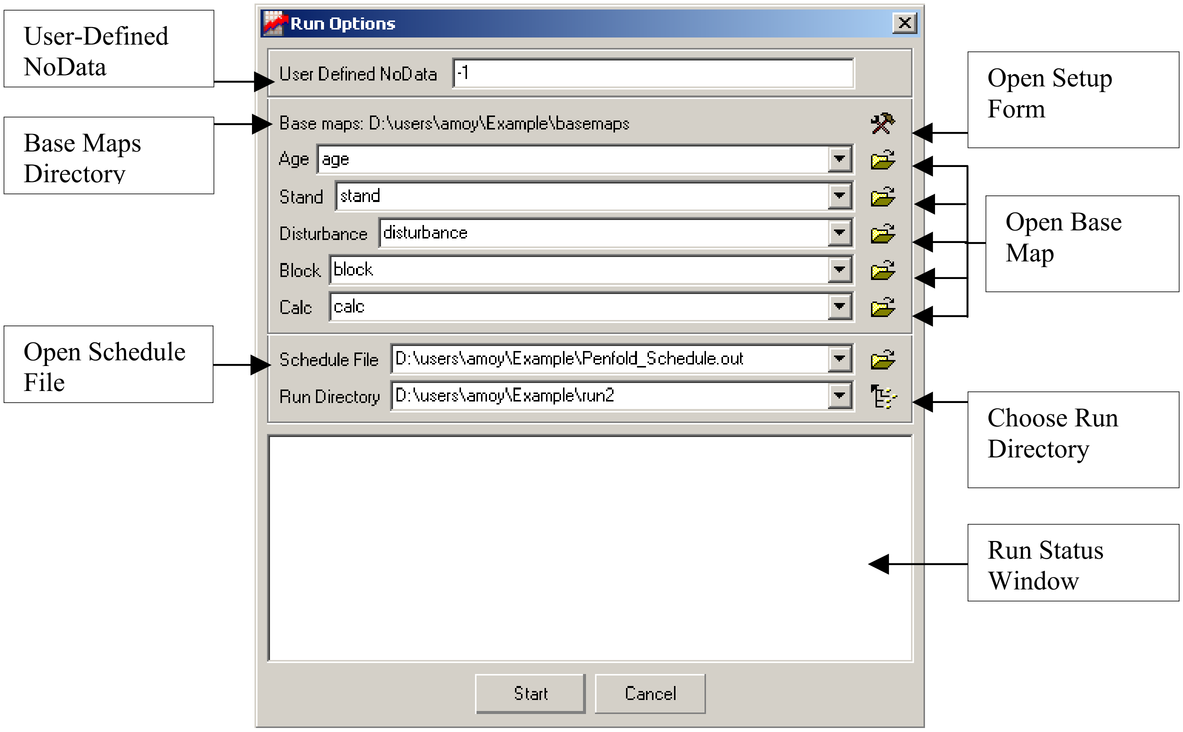
Attribute
To create a set of maps from a curve-based attribute, select the attribute from the Attribute drop-down or directly enter the attribute ID.

Landscape
Select a statistic from the Landscape Statistic Type column, then select the desired class from the Class column.

Landscape Statistic Type
[1] Seral Stages
[2] Stand
[3] Disturbance
[4] Patch Sizes
[5] Edge/Interior
[6] Age

Enter the years for which the analyses are to be evaluated in the **Run Years List**. Period-based output maps will contain year as part of the file name. These output maps include habitat suitability, attribute distribution, seral stages, stand, seral patch, seral edge and age.

Run Options



Before a run is executed, a user-defined no data value, base maps, schedule file and run directory must be chosen.

User-Defined NoData
The User-Defined NoData value is used to represent areas for which no data exists. While the NoData value can be any integer, it should be carefully chosen so that there is no possibility of overlap with actual map data values.

Base maps
The base maps to be used in a run are given in this section. The base maps directory was originally defined in the **Map Directories** tab on the **Setup** form; any changes to the location of the base maps directory must be made in the **Setup** form. See the Setup section for more information.

Schedule File
The schedule file used in SIMFOR is a tab delimited text file with the following format:

Year	Polygon ID	Disturbance Type	Reset Age	Goto Stand
5	3	2	0	-1
5	5	2	0	1
10	755	5	0	-1
10	889	2	0	-1

The **Year** field indicates when scheduled events are to occur. When a scheduled event takes place, the **Disturbance Type** is applied to the corresponding **Polygon ID** and the age of the polygon is reset to the age indicated in the **Reset Age** field.

The **Goto Stand** field is for optional use. When a disturbance event occurs, the **Goto Stand** value changes the existing stand to the Goto stand that has been specified for the polygon (block). The absence of this value or –1 indicates no change in the stand. Goto Stand values are defined in the Stand map/table; see the Stand tab in the Landscape section for more information.

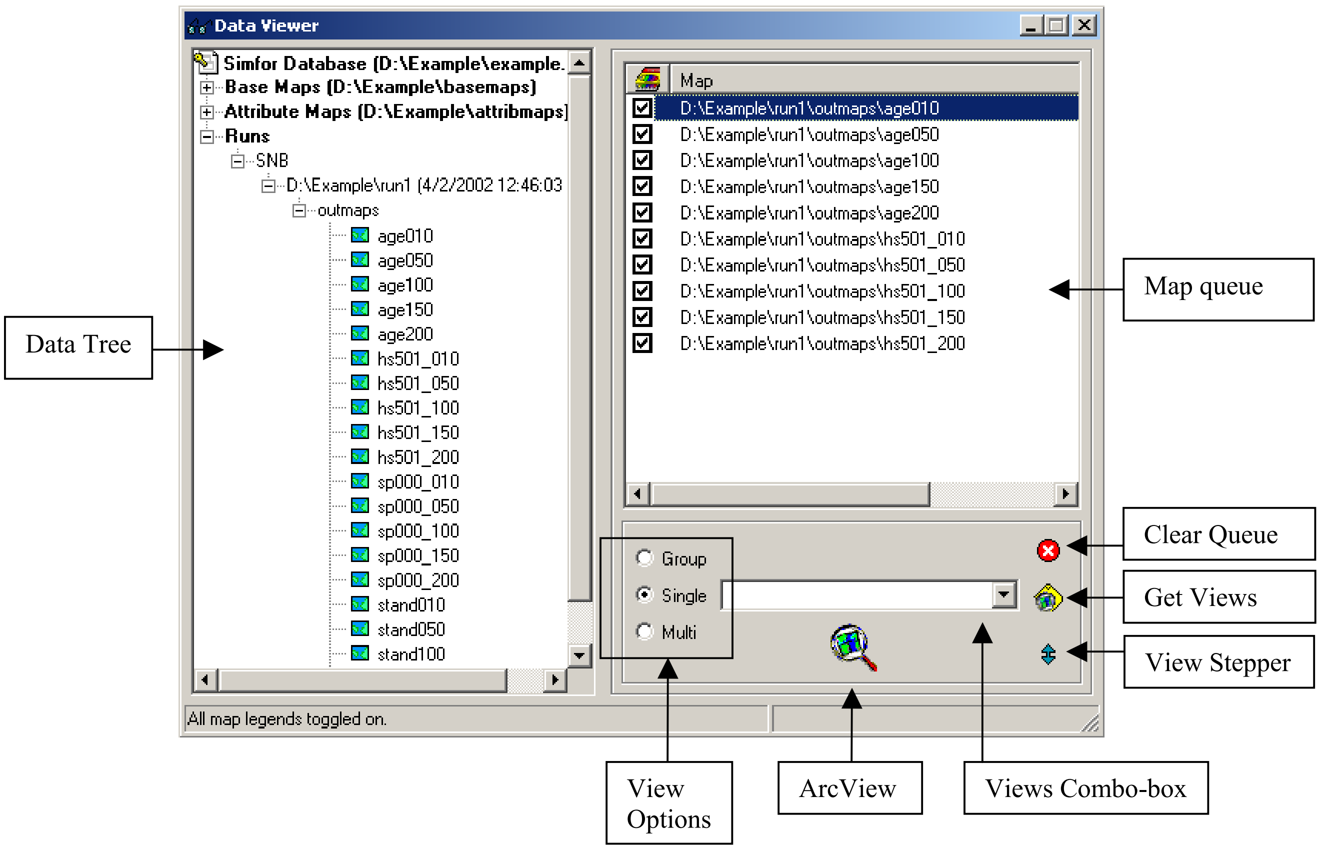
Run Directory

The results of each run are saved in a **Run Directory**. Output map files are saved in this directory under a sub-directory called 'Outmaps'. A log file, generated for each run, is saved in the root of this directory with the name log.txt.

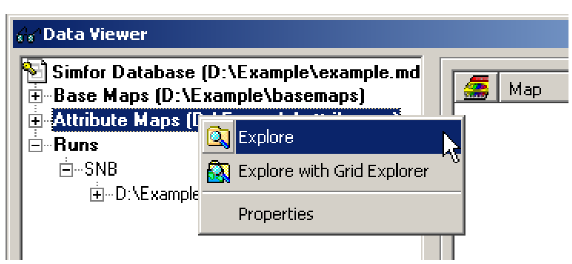
The run directory is specified by using the **Choose Run Directory** button to select the parent directory, after which a unique name for the given run is manually entered. The run directory must have a parent directory, or the run will not be performed. If an existing run directory is selected with the Choose Run Directory button, it will be overwritten.

Click the **Start** button to initiate a run. The progress of the run is displayed in the **Run Status Window** and the contents are saved as the log file (log.txt) in the root of the Run Directory.

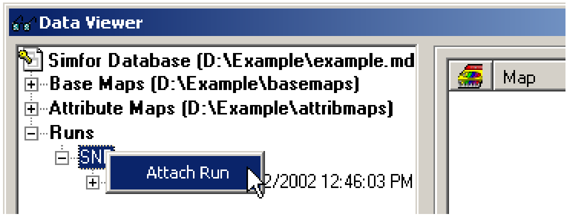
Data Viewer



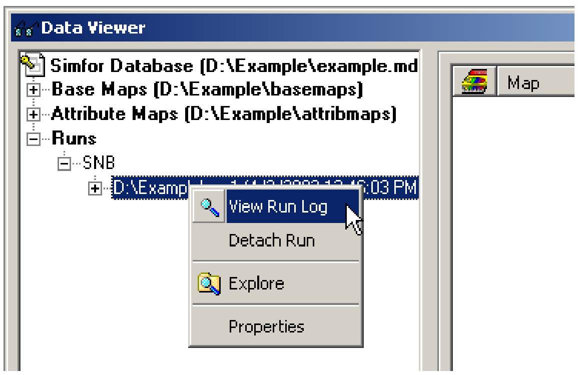
The Data Viewer is used to view output maps and other data from the currently loaded database. The **Data Viewer** consists of a **Data Tree,** a **Map Queue** and a **View Options** section. The **Data Tree** contains 4 main root nodes: **SIMFOR Database, Attribute Maps, Base Maps** and **Runs**. The SIMFOR database file can be opened in MS Access by double-clicking on the **SIMFOR Database** node. Clicking on the **Attribute Maps** and **Base Maps** nodes will list the various attribute and base maps. When a run is performed, the output data files are added to the Data Tree in the **Runs** node.



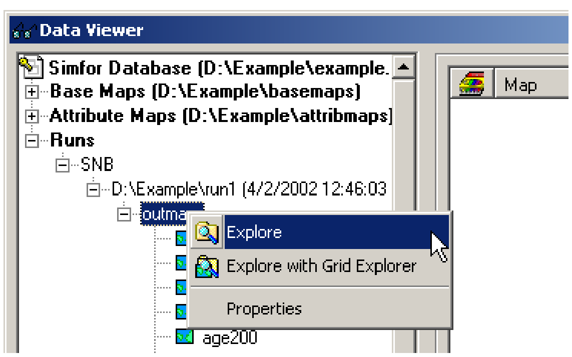
Right-clicking on either the **Base Maps** or **Attribute Maps** node will bring up the context menu as shown in the above figure. By choosing the '**Explore**' context menu item, this will open Windows File Explorer to the directory. By choosing the '**Explore with Grid Explorer**' context menu item, this will open Grid Explorer to the directory. For this option to work, ensure that Grid Explorer is installed and configured in Setup. Choosing the '**Properties**' context menu item will show the standard Windows file properties dialog for the directory.



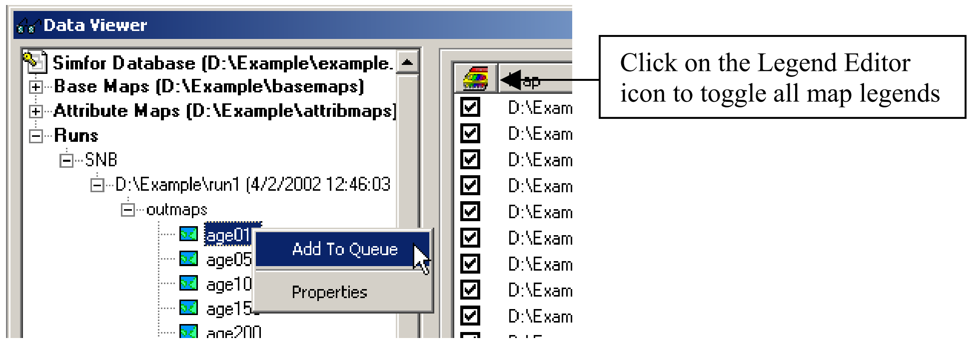
Right-clicking on the Run name node will bring up the context menu as shown in the above figure. By choosing the '**Attach Run**' context menu item, this will open the Browse for directory dialog, so that a run directory can be attached. This feature is particularly useful for re-mapping a run directory when the directory has moved or renamed. Caution should be taken when attaching runs, as the results may be incompatible with the current modeling parameters.



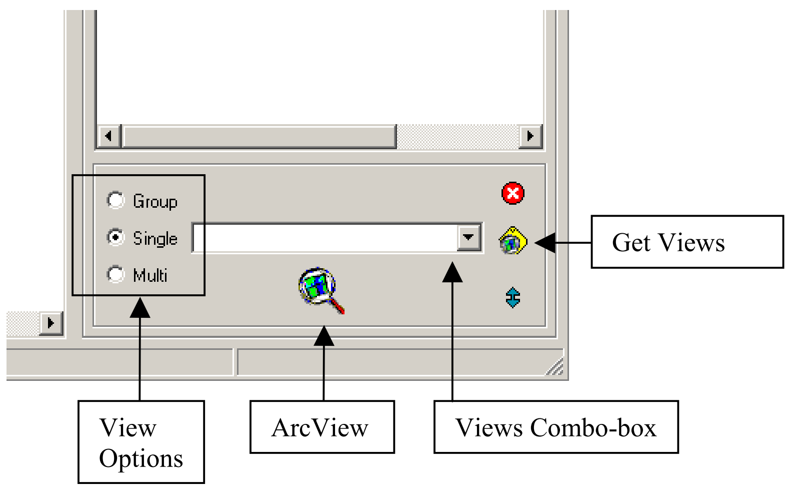
Right-clicking on the Run node will bring up the context menu as shown in the above figure. By choosing the '**View Run Log**' context menu item, this will open the log file for the run, so that it can be viewed. By choosing the '**Detach Run'** context menu item, a run can be removed from the data tree. To add the Run back, use '**Attach Run**' as outlined in the previous above section. By choosing the '**Explore**' context menu item, this will open the Windows File Explorer to the run directory. Choosing the '**Properties**' context menu item will show the standard Windows file properties dialog for the run directory.



Right-clicking on the **outmaps** node for a run will bring up the context menu as shown in the above figure. By choosing the '**Explore**' context menu item, this will open Windows File Explorer to the directory. By choosing the '**Explore with Grid Explorer**' context menu item, this will open Grid Explorer to the directory. For this option to work, ensure that Grid Explorer is installed and configured in Setup. Choosing the '**Properties**' context menu item will show the standard Windows file properties dialog for the directory.



There are several ways to place maps into the **Map Queue**. Double-clicking on a map will place it into the Map Queue to the right. To add several maps at once, highlight the maps while holding down the shift key and then either (1) right-click and use the **Add To Queue** context menu item, or (2) drag the selected items into the Map Queue. Once the map(s) have been transferred to the Map Queue, check the box to the left of the map name if you want to use SIMFOR legends in ArcView. Click on the box to check individual maps, or click on the legend editor icon in the upper left corner of the Map Queue to check all maps simultaneously. You can change this so that when queuing maps, the legend checkbox is turned on by default. See the Data Viewer section in Setup to change the default legend behavior when queuing maps. Also, see the Legend Editor section for more information on the criteria used for matching legends with maps.

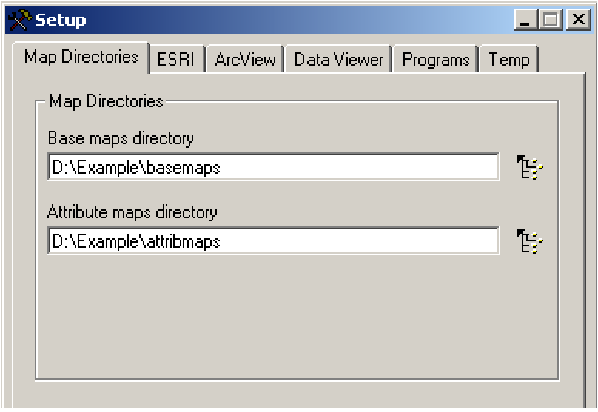


There are 3 ways to control the display of maps in ArcView using the **View Options** section: (1) display each map in a separate view [**Multi**], (2) group related maps into separate views [**Group**], or (3) display all maps in a single view [**Single**]. With the Single view option, the appropriate output view can either be selected from the **Views Combo-Box** to the right (use the **Get Views** button to refresh the list of Views) or typed in directly to create a new view/use an existing view. Once the desired viewing option has been selected, press the ArcView button to load the maps into an ArcView view.

Setup

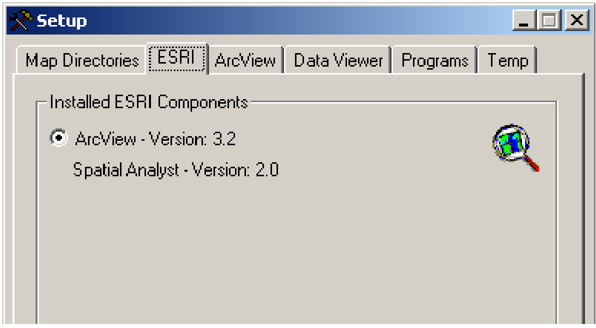
The Setup form is used to define parameters for the map directories, ArcView, Data Viewer, external programs and other resources.

Map Directories



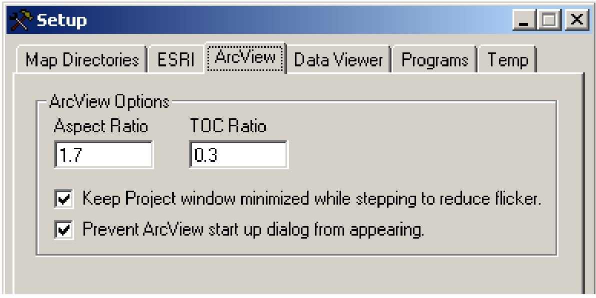
This section is used to define the location of the Base and Attribute maps. Click on the appropriate button to select the correct map directory. This section is also used to subsequently change the location of the Base and Attribute maps if necessary.

ESRI



This section displays the **ESRI** products that are currently installed on your computer.

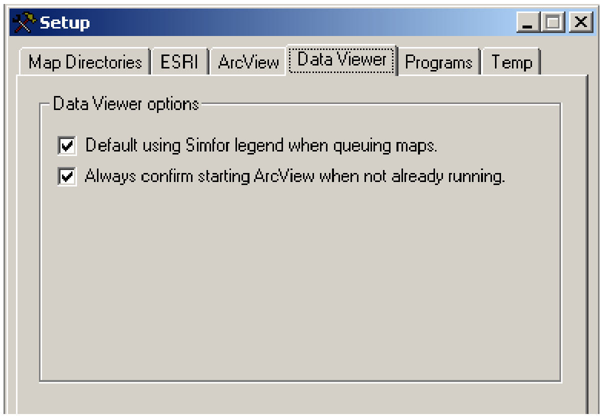
ArcView



This section is used to define viewing options for **ArcView**. The **View Aspect Ratio** sets the view area and is calculated by dividing the view width by the view height. The default View Aspect Ratio can be modified to maximize the view area for irregularly shaped landscapes. The **Table of Contents Ratio** sets the area in which the themes are listed for each view and is calculated by dividing the TOC width by the view width. The default TOC Ratio can also be modified to maximize the view area for irregularly shaped landscapes.

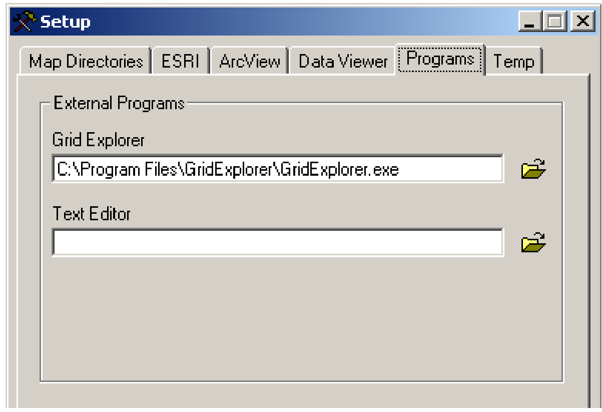
If the Project window is not minimized when using the View Stepper, a flickering effect may occur while stepping through maps. The flicker effect can be eliminated by choosing the **Keep Project window minimized while stepping to reduce flicker** option. For more information on the View Stepper, see the View Stepper section. To disable the ArcView 3.x Startup Wizard, choose the **Prevent ArcView start up dialog from appearing** option.

Data Viewer



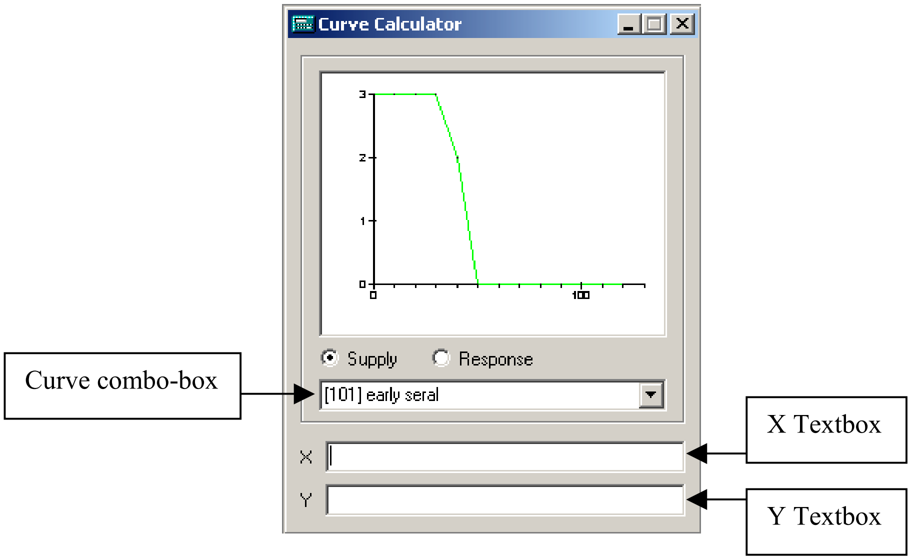
This section is used to define options for the **Data Viewer**. When maps are queued in the Data Viewer, the default SIMFOR legend can be set using the **Default using legend when queuing maps** option. When going to view maps in ArcView, the Data Viewer will confirm whether or not to load ArcView if it is not already running. This can be changed by using the **Always confirm to start ArcView when not already running** option. For more information on the Data Viewer, see the Data Viewer section.

Programs



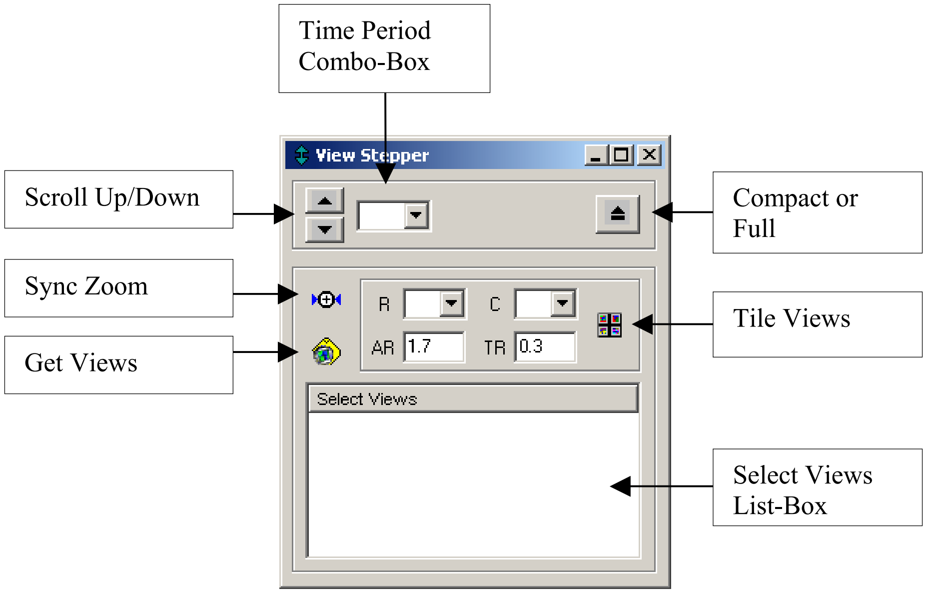
This section is used to define what external programs are to be used with SIMFOR. The **Grid Explorer** program aids with the management of grid coverages. It can be used to move (copy/paste) files without corrupting the grid data structure. To use Grid Explorer with SIMFOR, find where the Grid Explorer executable is located and select it.

Curve Calculator



The **Curve Calculator** can be accessed through the Tools menu. It is used to interpolate values of Y for a given X value, and is particularly useful for hand-verifying model results. To use the Curve Calculator, choose a curve type (supply or response) and select a curve either from the Curve combo-box or directly enter the curve ID. Then enter a value for X in the **X Textbox**; the Y value will be returned simultaneously in the **Y Textbox**.

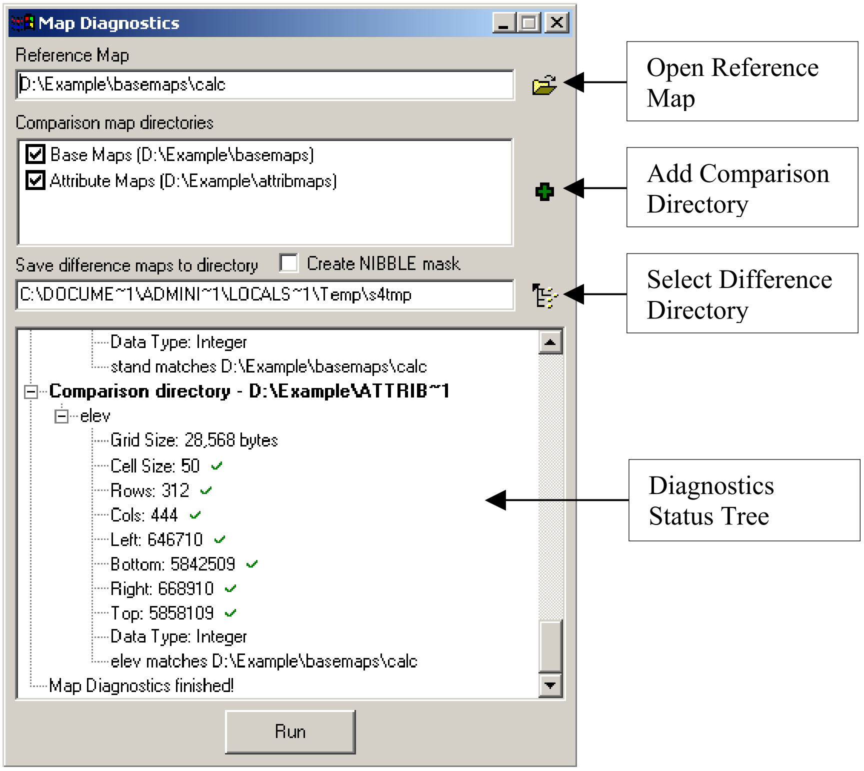
View Stepper



The **View Stepper** is used in conjunction with ArcView to display maps in one or more views while providing the functionality to (1) scroll between run periods, (2) zoom simultaneously to the same area in all Views, (3) tile views by rows and columns, and (4) customize the view order. Maps must be already loaded in ArcView to use the View Stepper. Once maps have been loaded, press the **Get Views** button for a listing of available views and then select the desired views by checking the boxes in the **Select Views List-Box**.

To scroll between output maps for different run time periods, click on the up or down arrows of the **Period Scroller**. The **Period Combo-Box** indicates the time period for the currently displayed map. To zoom simultaneously to the same area in all views, first zoom on one view, highlight the view name in the view list, then press the **Sync Zoom** button to synchronize all views. To tile views, use the R and C combo-boxes to specify the number of rows and columns for the display and press the **Tile Views** button to tile accordingly. The Aspect Ratio of each view can be adjusted by entering the ratio into the AR textbox. The Table of Contents Ratio of each view can be adjusted by entering the ratio into the TR textbox. To reorder views, drag the view name from the view list into the new position and then press the Tile view button to display the new order in ArcView.

Map Diagnostics Tool



When creating maps for a particular area, the Map Diagnostics tool should be used to ensure that all the maps share the same spatial extent and data area. If there are any mismatched maps, the results from a run may not be reliable. Select the Map Diagnostics menu item from the Tools menu to start the diagnostics tool. Now, choose a map that will be used as a reference to check all other maps against. Next, add the directories that contain the maps that are to be compared with the reference map. Note, the Base and Attribute maps directory are included in the list by default. These items can be excluded from the diagnostics by unchecking them. Optionally, a directory for saving difference maps can be set with the **Difference Directory** selector, otherwise by default the temporary directory will be used.

If there are any spatial extent problems, these will be flagged with a red X next to the problem item in the **Diagnostics Status Tree**. For each map that has mismatched data areas, a map is generated in the directory specified in the **Save difference maps directory.** These maps will identify where the input map is different from the reference map. The difference map is a boolean map where 0=no difference and 1=different. Alternatively, a nibble mask can be created, so that it can be used with the Arc/Info NIBBLE function to fill in the missing values. To enable this option, ensure that the **Create NIBBLE mask** checkbox is checked.

ArcView Reporting Scripts

The ArcView 3.x project file **report.apr** contains Avenue scripts for creating a variety of area summary reports. The following is a description of each script:

S4_area stats

This script will report area based on classes in the theme's classified legend for seral stage, habitat suitability or seral edge maps. To use this script, load the maps of one type into a new view and order them by run year. Next, run the script on this view and a report will be created.

Sample report:

Year	Name	Value	Area
0	-1	1.00000000	234498.24
0	-1 - 0.75	2.00000000	51700.68
0	0.75 – 1	3.00000000	4082.40
5	-1	1.00000000	234498.24
5	-1 - 0.75	2.00000000	49656.24
5	0.75 – 1	3.00000000	6126.84

S4_patch stats

This script will produce a report of area for a given patch size distribution. To use this script, load seral stage maps into a new view and order them by run year. Next, run the script on this view and you will be prompted to enter a patch size distribution. Enter the patch size classes separated by a comma and make sure the last class is larger than the largest expected patch. Ie. 10,100,200, 999999.

Sample report:

Year	Seral_Name	Seral_Value	S10	S100	S200	S999999
0	-1	-1	3845.88	13970.88	2977.56	50032.08
0	1	1	1072.44	7001.64	3570.48	11489.04
0	2	2	3061.80	9674.64	2530.44	68866.20
0	3	3	3249.72	9982.44	6787.80	72070.56
0	4	4	1720.44	6645.24	3006.72	8725.32
55	-1	-1	3845.88	13970.88	2977.56	50032.08
55	1	1	8326.80	22291.20	4208.76	10014.84
55	2	2	4072.68	12597.12	3797.28	12162.96
55	3	3	2958.12	8155.08	2721.60	86336.28
55	4	4	2579.04	8786.88	3900.96	26545.32

S4_stratify

This script will produce a stratified report for classes in a stratification map. To use this script, load maps of one type into a new view and order them by run year. Then add the stratification map to the view. Next, run the script on the view and choose the stratification map from the list.

Sample Report

Year	Strata_Name	Strata_Value	-1 - -0.999	-0.999 - 0.75	0.75 - 1
0	0	0	70826.40	0.00	0.00
0	1	1	0.00	51700.68	4082.40
0	2	2	59684.04	0.00	0.00
0	3	3	103987.80	0.00	0.00
5	0	0	70826.40	0.00	0.00
5	1	1	0.00	49656.24	6126.84
5	2	2	59684.04	0.00	0.00
5	3	3	103987.80	0.00	0.00

S4_stratify patch stats

This script will produce a stratified patch size distribution report for classes in a stratification map. To use this script, load maps of one type into a new view and order them by run year. Then add the stratification map to the view. Next, run the script on the view and choose the stratification map from the list. Next, you will be prompted to enter a patch size distribution. Enter the patch size classes separated by a comma and make sure the last class is larger than the largest expected patch. Ie. 100,500,999999.

Sample Report

Year	Seral_Name	Seral_Value	Strata_Name	Strata_Value	S100	S500	S999999
0	-1	-1	0	0	17817	8823	44187
0	-1	-1	1	1	0	0	0
0	-1	-1	2	2	0	0	0
0	-1	-1	3	3	0	0	0
0	1	1	0	0	0	0	0
0	1	1	1	1	2563	1004	518
0	1	1	2	2	3165	1533	3878
0	1	1	3	3	4167	3580	2725
0	2	2	0	0	0	0	0
0	2	2	1	1	4954	5508	10044
0	2	2	2	2	4218	3198	14548
0	2	2	3	3	9701	7400	24562
0	3	3	0	0	0	0	0
0	3	3	1	1	4928	5336	13893
0	3	3	2	2	5978	4837	15818
0	3	3	3	3	10339	10990	19971
0	4	4	0	0	0	0	0
0	4	4	1	1	4426	2608	0
0	4	4	2	2	1047	1464	0
0	4	4	3	3	3697	3914	2942
55	-1	-1	0	0	17817	8823	44187
55	-1	-1	1	1	0	0	0
55	-1	-1	2	2	0	0	0
55	-1	-1	3	3	0	0	0
55	1	1	0	0	0	0	0
55	1	1	1	1	9189	408	0
55	1	1	2	2	8320	188	0
55	1	1	3	3	14473	7024	5239
55	2	2	0	0	0	0	0
55	2	2	1	1	9338	1558	525
55	2	2	2	2	3891	1529	3836
55	2	2	3	3	5320	3904	2728
55	3	3	0	0	0	0	0
55	3	3	1	1	4659	2469	1669
55	3	3	2	2	3606	2161	32546
55	3	3	3	3	9150	7151	36761
55	4	4	0	0	0	0	0
55	4	4	1	1	4649	5472	15847
55	4	4	2	2	1348	1753	505
55	4	4	3	3	6545	5126	567

Examples

The following examples are based on the sample database that was copied into the SIMFOR install directory during the installation process. The database and map files are saved in a folder called Example, located within the install directory.

Example I
This example entails running a landscape level analysis using the sample database. The analysis involves simulating the effects of a harvest scenario on patch size distribution for 5 seral classes. The simulation is conducted at 10-year intervals for 5 time periods (10, 20, 30, 40 and 50 years).

1) Start SIMFOR and use **Open** from the **File** menu to select the sample .mdb database from [INSTALLDIR]\Example\.
2) To perform the patch run, first open the **Run Parameters** form by clicking the Run Parameters button on the main toolbar. You will see three tabs: choose the Landscape tab.
3) Under the **Landscape Run Parameters** section, there will be a **Landscape Statistic Type** and a **Class** column. The Landscape Statistic Type column contains the landscape analyses that SIMFOR can perform and the Class column contains the type of calculation. For more information on landscape analysis types and calculation classes, see Landscape in the Run Parameters section.
4) From the Landscape Statistic Type combo-box, select **Patch Sizes**. The 'ALL' class is the default selection and will include patches for all seral stages in the output patch map. Patch maps can be created for individual seral stages by selecting a specific seral stage in the **Class** column drop-down. For more information on defining seral stages, see the section in Landscape.
5) In the **Run Years** column, enter the run years to be used in the simulation. The periods 10, 20, 30, 40, 50 should each be entered on a separate line. These are the time periods for which output maps will be created.
6) Press **Run** to bring up the **Run Options** form. The Run options form is used to define the options for setting up the run.
7) For this example, choose –1 for **User Defined NoData**. For more information on how the User Defined NoData value is used, see the User Defined NoData section.
8) To define the base map directory, first press either the **Setup** button on the toolbar or the **Setup** icon located to the right of the 'Base maps:' caption. On the Setup form, use the directory picker (directory tree icon) to choose the directory [INSTALLDIR]\Example\basemaps for the **Base Maps Directory**. Ignore the **Attribute Maps Directory**, as attribute maps are not used in the patch analysis. Once the directory is set, the 'Base maps:' caption on the Run Options form should read 'Base maps: [INSTALLDIR]\Example\basemaps'. For more information on setting map directories, see Map Directories in the Setup section.
9) To select the base maps, use the **Open Folder** icon on the Run Options form to access the map picker for each of the 5 base maps - AGE, STAND, DISTURBANCE, BLOCK, CALC. Note that maps cannot be chosen outside of the base maps directory defined in the previous step.
10) To select the schedule file, use the **Open File** icon on the Run Options form to choose the file named 'Penfold_Schedule.out' from the directory [INSTALLDIR]\Example\. The schedule file was produced in Atlas – a forest-level harvest simulation model. For more information on schedule files used by SIMFOR, see the Run Options section.
11) To define the run directory, first use the directory picker (directory tree icon) to select [INSTALLDIR]\Example\. Manually enter 'patch' after [INSTALLDIR]\Example\ to give the run a specific name. If the [INSTALLDIR]\Example\patch directory does not exist, it will be automatically created; if it already exists, it will be overwritten. For more information on run directories, see the Run Options section.
12) To execute the run, press **Start**. Status messages will appear during the run to indicate progress.
13) The run output maps can be viewed with the **Data Viewer**, located on the main toolbar. Run results are accessed via the **Data Tree** under Runs->SNB->[run directory]->outmaps. There will be 5 maps listed under the **Outmaps** node – each map represents a patch map for a separate time period.
14) To select the 5 maps simultaneously, click on the first map (sp010), then hold down the Shift key and click on the last map (sp050). With all the maps highlighted, drag and drop the selection into the **Map Queue**.
15) To activate the SIMFOR legend for patch sizes, click on the legend checkbox to the left of each map within the Map Queue. The seral patch legend has already been defined for the sample database and is used to display the size distribution of patches based on patch area. To view the legend, open the **Legend Editor** and look under the **Output** tab for the **SERAL_PATCH** legend. For more information on linking legends to maps, see the Legend Editor section.
16) Select the **Single** option on the lower right pane of the Data Viewer, located below the Map Queue. Manually enter a view name, such as **PATCH**, in the textbox.
17) Press the **ArcView** logo to start ArcView. The maps will be loaded into a view named **PATCH** and will display the SIMFOR patch legend.

18) Start the **View Stepper** to view the maps in a controllable sequence. The View Stepper may be started either from the Tools menu or by pressing the View Stepper button, located in the lower right corner the Data Viewer.
19) Use the **Get Views** button to get a list of available views from ArcView. The 'PATCH' view (named in step 16) should be visible. Click on the checkbox to the left of the view to load 'PATCH' into the View Stepper. Note that the number of rows (R) and columns (C) reflect the number of views that have been loaded. In this example, only 1 view was selected and therefore, only 1 row and 1 column is used.
20) Use the **Scroll Up/Down** buttons in the View Stepper to step through the series of patch maps. To jump to a specific year, select it from the **Time Period Combo-Box**. For more information, see the View Stepper section.

Example II

This example entails running a habitat suitability analysis using the sample database. The analysis simulates the effects of a harvest scenario on habitat suitability for a shrub-nesting songbird species. The simulation is conducted at 10-year intervals for 5 time periods (10, 20, 30, 40 and 50 years).

1) Start SIMFOR and use **Open** from the **File** menu to select the sample .mdb database from [INSTALLDIR]\Example\.
2) To perform the habitat suitability run, first open the **Run Parameters** form by clicking on the Run Parameters button on the main toolbar. You will see three tabs: choose the Habitat tab.
3) Under the **Habitat Run Parameters** section, there will be a **Habitat Statistic Type** and a **Species** column. The Habitat Statistic Type column contains the habitat analyses that SIMFOR can perform and the Species column contains the species on which the analyses are performed. For more information on habitat analysis types, see Habitat in the Run Parameters section.
4) From the Habitat Statistic Type combo-box, select **Habitat Suitability**. From the Species combo-box, select the Shrub Nester species. For more information on defining species, see the Species section.
5) In the **Run Years** column, enter run years to be used in the simulation. The periods 10, 20, 30, 40, 50 should each be entered on a separate line. These are the time periods for which output maps will be created.
6) Press **Run** to bring up the **Run Options** form. The Run options form is used to define the options for setting up the run.
7) For this example, choose –1 for **User Defined NoData**. For more information on how the **User Defined NoData** value is used, see the User Defined NoData section.
8) To define the base and attribute maps directories, first press either the **Setup** button on the toolbar or the **Setup** icon located to the right of the 'Base maps:' caption. On the Setup form, use the directory picker (directory tree icon) to choose the directory [INSTALLDIR]\Example\basemaps for the **Base Maps Directory**. Likewise, use the directory picker to choose the directory [INSTALLDIR]\Example\attribmaps for the **Attibute Maps Directory**. Once the base maps directory is set, the 'Base maps:' caption on the Run Options form should read 'Base maps: [INSTALLDIR]\Example\basemaps'. For more information on setting map directories, see Map Directories in the Setup section.
9) To select the base maps, use the **Open Folder** icon on the Run Options form to access the map picker for each of the 5 base maps - AGE, STAND, DISTURBANCE, BLOCK, CALC. Note that maps cannot be chosen outside of the base maps directory defined in the previous step.
10) To select the schedule file, use the **Open File** icon on the Run Options form to choose the file named 'Penfold_Schedule.out' from the directory [INSTALLDIR]\Example\. The schedule file was produced in Atlas – a forest-level harvest simulation model. For more information on schedule files used by SIMFOR, see the Run Options section.
11) To define the run directory, first use the directory picker (directory tree icon) to select [INSTALLDIR]\Example\. Manually enter 'shrub_nester' after [INSTALLDIR]\Example\ to give the run a specific name. If the [INSTALLDIR]\Example\shrub_nester directory does not exist, it will be automatically created; if it already exists, it will be overwritten. For more information on run directories, see the Run Options section.
12) To execute the run, press **Start**. Status messages will appear during the run to indicate progress.
13) The run output maps can be viewed with the **Data Viewer**, located on the main toolbar. Run results are access via the **Data Tree** under Runs->SNB->[run directory]->outmaps. There will be 5 maps listed under the **Outmaps** node – each map represents a patch map for a separate time period.
14) To select the 5 maps simultaneously, click on the first map (hs501_010), then hold down the Shift key and click on the last map (hs501_050). With all the maps highlighted, drag and drop the selection into the **Map Queue**.
15) To activate the SIMFOR legend for habitat suitability, click on the legend checkbox to the left of each map within the Map Queue. The Shrub Nester habitat suitability legend has already been defined in the sample database and is used to display 3 classes that represent high, medium and low habitat suitability. To view the legend, open the **Legend Editor** and look under the **Output** tab for the **SNB** legend. For more information on linking legends to maps, see the Legend Editor section.
16) Select the **Single** option on the lower right pane of the Data Viewer, located below the Map Queue. Manually enter a view name, such as **SHRUB NESTER**, in the textbox.
17) Press the **ArcView** logo to start ArcView. The maps will be loaded into a view named SHRUB NESTER and will display the SIMFOR habitat suitability legend.
18) Start the **View Stepper** to view the maps in a controllable sequence. The View Stepper may be started either from the Tools menu or by pressing the View Stepper button, located in the lower right corner the Data Viewer.
19) Use the **Get Views** button to get a list of available views from ArcView. The 'SHRUB NESTER' view (named in step 16) should be visible. Click on the checkbox to the left of the view to load 'SHRUB NESTER' into the View Stepper. Note that the number of rows (R) and columns (C) reflect the number of views that have been loaded. In this example, only 1 view was selected and therefore, only 1 row and 1 column is used.
20) Use the **Scroll Up/Down** buttons in the View Stepper to step through the series of habitat suitability maps. To jump to a specific year, select it from the **Time Period Combo-Box**. For more information, see the View Stepper section.