Working with WinERMS

Starting WinERMS

Once installation is complete you can start WinERMS by double-clicking the WinERMS icon in the Program Manager.

Using the sample WinERMS database

To use the sample WinERMS database, follow the instructions provided in the enclosed tutorials.

Using other existing ERMS databases with WinERMS

You can use any of your existing ERMS databases with WinERMS. This section describes how to use an existing database in WinERMS.

To use an ERMS database with WinERMS

1. Run WinERMS, and choose Open Database from the File menu, and then click on the Add button in the dialog box.

2. In the AREA.IND box type the path to the directory containing the database, or press the Browse button and look for the AREA.IND file in the database directory.

3. Choose the OK button, to add the database to the list of databases available in WinERMS.

4. Choose Open Database from the File menu, and select the database from the list of databases.

5. Choose the OK button, and now build a map with the new database.

Configuring Windows for WinERMS

Choosing optimal display settings

Display and memory settings in Windows affect how WinERMS performs. In general the greater the number of colours supported by the display device, and the larger the number of pixels, the slower WinERMS (and Windows in general) will run. Maps produced using more colours and pixels will, however, look better. The table below lists the most common colour and pixel resolution options.

	Fastest		Slowest (Best looking maps)
Pure Colours	16	256	64K
Resolution	640x480	800x600	1024x760

The standard VGA display has a resolution of 640x480 pixels and can display 16 pure colours. It simulates other colours by dithering or mixing the pure colours. This is the fastest display with a map resolution very similar to the DOS ERMS program.

As a good compromise between speed and map appearance we recommend using 256 colours with a resolution of 800x600 on a 486 processor computer, or 640x480 on a 386 processor computer. Please note that some display adaptors cannot support these colours or resolutions, please check with your hardware supplier.

Using WinERMS Help

WinERMS comes with Help, an online reference tool, that includes step-by-step procedures that you can follow as you work, and reference information about using WinERMS commands.

What's In Help?

You can view the WinERMS Help Contents window by choosing Contents from the Help menu. From this window you can "jump" to more specific information. Click on the underlined text in the window to jump to the help topic.

Getting Started	Click to view a general introduction to WinERMS.
Mapping	Click to see comprehensive information about creating maps.
Command Reference	Click to see a list of WinERMS commands.
ERMS Data Types	Click to see details of the data types supported by WinERMS.

Getting Help

You can get help in several ways. For example, you can choose the help button in any dialog to get context-sensitive help. Pressing the F1 function key will also display context-sensitive help. You can even get help about how to use the Help system. Choose Contents from the Help window. Then, in the Help window, choose How To Use Help from the Help menu.

Searching for Help

The fastest way to get Help on a topic is to use the search feature. To open the Search dialog box choose Search from the Help menu, or click on the Search button in the Help window.

WinERMS TUTORIALS

Introduction

The aim of the WinERMS tutorials is to provide an introduction to the WinERMS GIS mapping environment. The tutorials are designed to be used in conjunction with the Windows and WinERMS on-line Help. The tutorials start out with a step-by-step description of how to produce, view and save a simple map. As the tutorials progress the user is introduced to more complicated WinERMS functions, such as Boolean overlaying. The user is encouraged to experiment with the options available throughout the mapping process in order to gain an appreciation of the functionality and flexibility of WinERMS. The tutorials are based on the WinERMS demonstration database which is a series of selected map layers from the Northeast Forests Biodiversity Study (NEFBS). A number of grid-cell layers (eg elevation and solar radiation index) and line layers (eg the study area boundary, roads and watercourses) are provided. You will also be introduced to new types of WinERMS map layers, ie. polygons, vectors and points.

Working with Microsoft Windows

Before you start the WinERMS Tutorials, you should know how to use Microsoft Windows, including how to do the following:
- Use Program Manager and File Manager.
- Use the mouse (click, double-click, and drag).
- Move around in a window and use the scroll bars.
- Move, resize, and close a window.
- Choose commands from menus and select options in dialogue boxes.
- Locate, open, copy and delete files.

Refer to your *Microsoft Windows User's Guide* for more information on any of these techniques.

WinERMS Tutorial Outline

- Tutorial 1: Creating a WinERMS Map. A step-by-step guide to producing a simple map and an introduction to the basic functions of WinERMS.
- Tutorial 2: Advanced colour control and map layout, introduces advanced colour control including colour ramping, the use of default and user defined palettes, duplicating a map view and displaying more than one map at a time.
- Tutorial 3: Using the new WinERMS data types including display and linkage to a DBMS.
- Tutorial 4: Enhanced Boolean overlaying in WinERMS. A two part tutorial describing the new functionality.
- Tutorial 5: Printing a map from WinERMS. A step by step guide to producing a hardcopy map.

Tutorial 1: Creating a WinERMS Map.

Tutorial 1 describes steps for the production of a simple map and introduces some of the basic functions of WinERMS, including colour selection and zooming a map view.

Open WinERMS

1. Type **win** at the command line and Double-click on the WinERMS icon in the WinERMS program group in the Windows Program Manager window.

Open the WinERMS Sample Database

2. Select Open Database from the File menu.

3. Choose the North East Forests (WinERMS Demo) sample database (double-click on the database name or click on OK).

When you first install WinERMS only the supplied sample database is displayed in the Databases list. However, by using Add Database from the File menu, other existing databases can be added to the list, including any existing DOS E-RMS databases residing on your machine. WinERMS allows simultaneous access to multiple databases. Maps from two or more databases can be displayed and manipulated on the screen at the same time.

Create a WinERMS Map

4. Select New Map from the Map menu.

You may also create a new map by choosing the New Map button on the toolbar, or by holding down the right mouse button and selecting New Map from the Quick Menu.

In all cases, a dialog window titled Map Specification appears, which allows you to specify the map contents. Choose a tab panel of controls for the layers or options you wish to set or change. For example: selecting the Base tab panel will display the Base Layer and Colour buttons, allowing you to set the contents of the map base layer and its colours. The Options tab panel contains controls affecting the entire map such as window positioning, zoom area selection and saving a user-defined variable.

Specify a Base Layer

5. In the Map Specification dialog, choose the Base tab, and select the Base Layer button.

A new dialog window titled Select BASE Layer appears (all functionality discussed here also applies to the Top Layer). All available variables are displayed in the Variables list. The picture on the left side of a variable name indicates the variable type. The variable types represented are gridcell, polygon, vector, and point data types. The gridcell data type is present in DOS E-RMS. The polygon, vector, and point data types are new to WinERMS and will be discussed in Tutorial 3.

Select a variable from the list by clicking on it. Selecting a variable will display its categories in the Categories list. If there are too many items to appear in the list, then a scrollbar is displayed on the right-hand side of the list. Click the top or bottom of the scrollbar, or drag the indicator with the mouse to view more items in the list.

Different methods and short cuts are available for specifying base or top layer contents from these two list boxes. After selecting a variable you need to select which categories of the chosen variable are to be included in the current layer. To select all categories hold down the left mouse button and drag the pointer over all the categories either from top to bottom or bottom to top. Select OK to register your selection. A useful shortcut is to double click on the required variable which then automatically selects all of the variable's

categories and registers the selection. A single category can be chosen by clicking on it with the left mouse button. This highlights the chosen category and selecting OK registers the selection. If you wish to select two or more (but not all) categories, hold down the Control (Ctrl) key and either use the left mouse button to select individual items or drag the pointer to select blocks of successive categories. When all required categories have been highlighted release the Ctrl key and select OK to accept the selection.

More information about functions available in dialog windows such as this can be found by either pressing the F1 key or selecting Help which will give context sensitive information on the available operations in the displayed dialog box.

6. Under Variables, select Elevation (100m classes).

7. Select all elevation categories using one of the methods described under step 5 and select OK to display the map.

Altering the contents of the Base Layer

8. Position the mouse pointer over the displayed map and hold down the right mouse button to display a Quick Menu and select Map Contents (do not release the mouse button until you have moved the highlight bar to the Edit Map item in the Quick Menu). The Map Specification dialog window will be redisplayed. Make sure that the tab named Base is selected (at the top of the stack) and select Base Layer.

Note that using the Quick Menu is not the only way to redisplay the Map Specification dialog window. This can also be achieved by either selecting Specification from the Edit menu or by clicking on the Change View Specification button in the toolbar.

9. Select Vegetation Systems (Landsat TM) and choose the two categories Moist Open Forest and Dry Open Forest. Remember that they can be selected by either dragging the mouse pointer over both of these categories as they are adjacent to each other or hold down the Ctrl key and individually select these two categories.

10. Select OK twice to display the modified map.

This is a good place to learn more about the functionality of the Quick Menu. The menu is activated by holding down the right mouse button and highlighting a selection to perform a desired operation. Move the mouse pointer to some location that is not over the map or the legend and activate the Quick Menu by holding down the right mouse button. Note that the operations available allow only the creation of a new map or the opening of an existing one (saved to file). Now move the mouse pointer over the displayed map and activate the Quick Menu. Notice that the available operations only include those that are relevant to the map such as editing variables or colours in either the Base or Line layers. Finally move the mouse pointer over the legend and activate the Quick Menu. The only operations available are those that relate to the legend itself such as changing the font used and whether the legend is displayed or not. As you have just seen the Quick Menus are context sensitive. They provide a quick alternative to using the menu bar at the top of the screen for carrying out common operations.

Basic colour selection

11. Use the Quick Menu to select Base Colour which will then display the Category Colour/Style dialog window. Alternatively select Base Colour from the Colour Menu.

Basic colour selection involves three operations. Firstly, category selection uses the same single or multiple selection methods as discussed under step 5. Secondly, colour assignment for the selected categories is accomplished by selecting one of the displayed colours from the Colour list box. Thirdly, the colours may be layed down using any one of the Pattern selections available by clicking on the down arrow to the right of the Pattern box which will then display a series of patterns from solid through a collection of hatched patterns to a set of symbols. Note that if a symbol is chosen, then another list box below

becomes active so that the symbol point size can be set in the same way that one sets the point size of a selected font.

12. Select the Moist Open Forest category and choose a light green colour but leave the pattern solid (the default).

13. Now select the Dry Open Forest category and choose a red colour but this time select a hatched pattern from the Pattern list.

14. Select OK and the map will be redisplayed with the new colours and styles.

Modify the Line Layer

15. Use the Quick Menu to select Map Contents and select the Lines tab.

16. Select the Line Layer button to display the Select Lines dialog window.

17. From the Border group box, select 'Map border with tick marks' and make sure that the 10,000m grid is selected.

WinERMS supports user-selectable spacing of tickmarks and gridlines ranging from 10m to 100km.

18. Now modify the selection of displayed lines. Currently active lines are highlighted. To change this selection hold down the Ctrl key and deselect '30 Minute Grid' and select 'Highways' and 'Major Roads'. Leave 'NEFBS Study Boundary' active.

19. Select OK twice to display the updated map.

Note that the base layer was remade much faster than in the initial display. This is because unchanged layers are not rebuilt if a map view is edited but simply copied to the screen display. This speeds up the redisplay of maps that have only some but not all layers changed as a result of editing a map view.

20. To make the highways and major roads more distinguishable use the Quick Menu to select Line Colour. Now select the highway category and choose a red colour. Then select the major roads category and choose a dark brown colour. Then select OK to redisplay the map.

Reposition the map display window

21. Try repositioning the map window on the screen by placing the mouse pointer over the window title bar, holding down the left mouse button and dragging the window to a new position.

Resize the map display window

22. The map display window may be resized by positioning the mouse pointer over any border or corner of the window, holding down the left mouse button and dragging in the direction of the arrows that popup to replace the default pointer.

23. In addition to the above step, there are three default window sizes that can be invoked by selecting either the maximise, minimise or restore items in the map window's menu.

To activate the menu, point and click on the icon in the top left hand corner of the window. To make the window occupy the full screen, use the Maximise menu item. To make to the window shrink to an icon use the Minimise menu item. The Restore item will restore the window to its original size. These operations can also be performed using the arrow buttons in the top right corner of the map window.

Zoom in and out of the map display

24. Make the map window occupy the full screen using the window's Maximise menu item.

25. To choose a rectangular area that you want to zoom into, position the mouse pointer over one of the four corners. Now hold the left mouse button down and drag the mouse pointer over to the diagonally opposite corner.

This should have drawn a box delineating the proposed zoom area.

26. Use the Quick Menu (right mouse button) to select the Zoom In menu item and the map will be remade so that the zoom area is enlarged to fill the map window.

The Zoom Into Map button on the toolbar can be used in place of the Zoom In menu item.

27. Repeat steps 25 and 26 to zoom in further.

28. Repeat steps 25 and 26 to zoom in even further still.

29. Using the Quick Menu, select Zoom Out. Repeat this step to zoom out more than one level.

Two things are worth noting while you do this. Firstly, unlike DOS E-RMS, zooming out in WinERMS takes you to the previous zoom level, not to the entire database area. Secondly, previous zoom levels are redisplayed very quickly as explained in greater detail below.

30. Using the Quick Menu select Full Size. The original full map should be redisplayed without having to rebuild any of it's component layers.

The Zoom In/Out functionality has been implemented to optimise map refreshing in such a way that for each level of zoom, a 'snapshot' of the area is stored so that when backing out of the zoom, the redisplay occurs as fast as possible. You can also go directly from a deeply nested set of zoom levels to the original full area by simply choosing the Full Size menu option. Note that under low memory conditions, only the very bottom layer of the zoom is stored so that incremental zooming out will cause each interim level to be rebuilt, resulting in a slower redisplay.

Save the map or workspace

Since we are at the end of Tutorial 1, this would be a good time to discuss options available to you in order to save your work. At this point you can either save the map that you produced or save the entire workspace on your screen. The differences are as follows:

Saving a map

31. Select either Save or Save As... from the File menu or use the tool bar Save View to Disk button to display a Save As window.

32. Type in a filename without any .extension as WinERMS map view files all have a .WMP file extension added when they are saved. Select OK to save the map.

Saving a workspace

33. Select Save Workspace from the File menu.

34. Type in a filename without any .extension as WinERMS workspace files all have a .WMK file extension added when they are saved. Select OK to save the workspace.

The major difference between saving a map view and saving a workspace is in the extent of information saved.

When a map view is saved, only the instructions needed to reconstruct the map view from your selected database components, the zoom level and colour information for the display components are stored.

However, when a workspace is saved, a 'snapshot' of your WinERMS desktop is saved. This includes all map views, their respective window sizes and screen positions plus all the information required to reconstruct exactly what was on the screen when you saved the workspace.

The four most recently saved map views or workspaces can be reloaded simply by selecting the desired filename from the list at the bottom of the File menu.

Exiting WinERMS

35. Either proceed to the instructions for Tutorial 2, or exit WinERMS by selecting Exit
from the File menu.

Tutorial 2: Advanced colour control and map layout

Tutorial 2 introduces advanced colour control including colour ramping and the use of default and user defined palettes. Also discussed is the use of predefined plot windows, duplication of maps and display of multiple maps on the same screen.

If you are continuing from tutorial 1 or have any maps on the screen, it is a good time to clear your workspace in preparation for this tutorial. Use the Close command from the File menu for each map window still displayed on the screen.

Using predefined Plot Windows

1. Select New Map from the Quick Menu to display the Map Specification window.

2. Select the Base tab and click on Base Layer to display the Select Base Layer dialog window.

3. Now double click on Solar Radiation to select all categories of that variable.

4. Select the Options tab and click on Zoom Area... to display the Select Zoom Area dialog window.

5. Click on the down arrow to the right of <current zoom area> to display the list of available zoom areas and select the item labelled 'Central Section'.

Note that you can define your own zoom areas by typing AMG values into each of the four minimum/maximum Easting and Northing boxes. Also, any new zoom areas that you define either by typing in coordinates or by using the interactive zoom-in function may be saved for future use. Do this by selecting the Save... button, typing in a new name for your zoom area and selecting OK to save it.

6. Select OK twice to exit the dialog windows and display the new map.

Default and User Defined colour palettes

Each of the variables in the sample database has been assigned a default palette. These palettes are designed to provide a good selection of default colours for the categories of each variable. The default colours for the displayed Solar Radiation variable are shades of grey ramping from black to white. Any user defined palette can be saved as the default palette for a particular variable. This facility is enhanced by the ability to associate the palette with either a base layer or top layer. That is, you can have two separate default palettes for each variable, one for when the variable is chosen as a base layer and one for when the variable is chosen as a top layer. User defined palettes for the lines layer can also be saved as default palettes.

If you define a palette for a particular variable and wish to overwrite the current defaults supplied with this variable in the sample database, then choose the Save Defaults... item from the Colour menu.

Applying Colour Ramping to a variable

7. Use the Base Colour in the Quick Menu to display the Category Colour/Style dialog window and select Ramp which brings up the Colour Ramping dialog box.

8. Select a dark green colour for the Start Colour and a light green for the End Colour. Press OK twice to redisplay the modified map.

Notice that the definition between categories is not very clear. This can be improved by creating a larger difference between the start and finish colours. To do this we need to alter the colour detail for both the start and finish colours.

9. Select the Base Colour item from the Quick Menu as before and select Ramp...

10. Select the Start Colour Detail button to display the Colour Detail dialog window. Using the mouse pointer, drag the triangular slider gadget down towards the black end of the scale to create a very dark green shade. Select OK to return to the Colour Ramping dialog window.

11. Now select the End Colour Detail button to again display the Colour Detail dialog window as in step 10. As before, use the mouse to drag the slider gadget up towards the white end of the scale to create a very light shade of green. Select OK to return to the Colour Ramping dialog window.

12. Select OK to redisplay the updated colours for this map.

Notice that the definition of the map has increased with the improvement in colour range. This could be a good time to investigate other features of the Colour Detail dialog window. Select Base Colour from the Quick Menu, select Ramp and then select Start Colour Detail. Colours can be chosen from the main spectrum which is the large square multicoloured region in the top left. By simply clicking anywhere in this box a particular colour can be quickly chosen. Dragging the crosshair under the mouse pointer horizontally alters the Hue. Dragging the crosshair vertically alters the Saturation. The triangular slider gadget referred to in step 10 may be used to alter the Luminosity of the chosen colour. Also individual values within the range of 0-255 may be entered in either the Hue, Saturation (Sat), Luminosity (Lum) boxes or the Red, Green, Blue boxes to change the colour. Use Cancel to remove the stack of dialog windows so that you are back at your map display.

Duplicating regions or full maps

13. Using the left mouse button define a rectangular area of interest, set it to about one quarter of the existing map size.

14. Now select Duplicate from the Map menu (or alternatively select the Duplicate button on the toolbar.)

This will copy the contents of the map contained within the region to a new window but will retain the same colour detail as in the original.

15. Position the mouse pointer somewhere over the legend of this new map and using the Quick Menu, deselect the Legend menu item.

This will force a redraw of the map display. With the legend out of the way, there is more room to display a larger representation of the zoom area that you duplicated before.

Note that if you do not define a zoom region when you duplicate a map, then the same map extent in the source map is used as the map extent in the duplicate copy.

Displaying more than one map at a time on the screen

16. Select Tile from the Window menu to display the original and duplicated region side by side on the screen.

You can have any number of maps up on the screen at the same time (as available memory allows). To see all of these at once, use the tile function. However, each map may will be rather small if you attempt to tile a number of maps at once. Removing the map legends can improve the individual map visibility by allowing more space in each window for its map display. In the situation where you wish to have a lot of maps (or even a couple of large ones) on the screen at the same time, the Cascade option in the Window menu may be a better choice as it will allow for maps to be stacked one behind the other.

17. Select Legend from the Options menu to redisplay the legend and rebuild the map of the zoomed in area that you duplicated a few steps ago.

18. Select Cascade from the Window menu to redisplay the maps one behind the other.

By holding down the Ctrl key, and then pressing the Tab key, you can scroll through your maps one at a time. Note the fast refresh rate because each map does not have to be rebuilt for redisplay.

It is important to note that only ONE window has the focus at a time. That is, menu operations will only apply to the currently active map window. This is easily identified as the window in front of all other displayed windows and with a highlighted title bar. Clicking with the left mouse button over a chosen window will bring it into focus.

Remember that map windows can also be revised and/or repositioned by dragging their edges or title bar with the mouse.

Defining the screen position and size for a new map

19. Select New map and choose the Options tab. Now select the Window button and click on OK in response to the instruction window that appears. A crosshair should appear on the screen. Position the crosshair at the desired corner position and drag it out to the opposite corner to define the new window size. Now release the mouse button and the Map Specification window should reappear.

20. Select the Base tab and select all categories of the Geology (Lithological classes) variable. Choose OK to display the new map at the position and with the dimensions defined in the previous step.

Copying and Pasting specifications between maps

You will now be introduced to a very powerful feature of WinERMS, the ability to copy parts of one's specification to other displayed maps via the Windows clipboard.

21. Bring the zoomed-in duplicate map of Solar Radiation to the foreground and make it the active window either by clicking on it or using Ctrl Tab.

22. Use either Map Contents on the Quick Menu or Contents on the Map menu to display the Map Specification dialog. Choose the Lines tab and select Line Layer. Add Coastline/Estuaries and Watercourses to the selected lines (remember to hold down the Ctrl key while you click on the items). Press OK twice to display the edited map.

23. Select Copy Contents from the Edit menu and then click on the boxes to the left of Zoom area and Lines. Press OK.

You have now copied part of this map's specification (the current zoom area and active lines) to the Windows clipboard.

24. Bring the Geology map to the foreground and make it the active map either by clicking on it or using Ctrl Tab.

25. Select Paste Contents from the Edit menu.

The map specifications you copied to the clipboard in 23 are now transferred to this map.The map should automatically zoom in to the area displayed on the Solar Radiation map and acquire the same lines as displayed on that map.

26. Use any of the techniques you have learnt so far to position the two maps side by side for comparison.

Tutorial 3: Using the new WinERMS data types.

Tutorial 3 demonstrates the three new WinERMS data types. These are the Point, the Vector and the Polygon types. An important feature of these data types is the ability to link spatial entities within a WinERMS database to attribute information held in an external database management system (DMBS) table.

Introducing the POINT data type

The POINT data type allows locational records of plants, animals, cultural sites etc to be stored as exact points within WinERMS instead of being generalised to grid cells. These points can also be linked to attribute information held in a DBMS table. In this example, Honeyeater records have been exported from an Advanced Revelation database and converted to DBASE IV format. The geographical locations of these records have been loaded into WinERMS as a point variable, and a direct link established between this variable and the DBASE file.

1. Select New Map and choose the Base tab. Select the Honeyeater Records variable, choose the first three categories and click on OK.

Note the POINT data type icon in the variable list next to the Honeyeater Records item.

2. Click on the Options tab to activate it. Click on the Zoom Area button to display the Select Zoom Area dialog window. Choose 'Northern Section' from the Zoom area list. Click on OK twice to display the map.

Note that a number of records are displayed on the map. This was the reason for restricting the selection to only three categories and choosing a sub set of the entire database area for the display. Otherwise, the map would have displayed an indistinguishable cloud of points.

3. Now zoom in a couple of levels to provide a clear view of some of the individual records.

Note that each record is defined by a symbol and a label is displayed to the right of the symbol. When establishing a DBMS link any field of the DBMS table can be nominated as the label field, the contents of which are then used to label individual entities (records).

4. To access more information about a particular point, double click with the left mouse button near to the chosen point. A DBMS Query Result window will appear which displays the contents of the DBMS record associated with this point.

You have just carried out a 'point and click' database query.

5. Click on the Close button in the DBMS Query Result window to remove it from the display and then zoom back out to where the records appear tightly clustered and somewhat indistinguishable.

If you zoomed too far back, so that the entire database area is displayed, then select Map Contents from the Quick Menu. Now use the Options tab to select the Northern Section as you did in step 2. Select OK twice to redisplay the map.

6. Use the left mouse button to define a rectangle around a clustered group of points. This procedure is the same as for the zoom in function.

7. Select Show Info from the Quick Menu or click on the Display DBMS Information button in the toolbar. A stack of Query'Result windows should appear (if there was more than one item in your defined query region). Clicking on the Next >> and <<Prev

buttons in each window allows you to scroll through the stack of DBMS records for all points falling within the specified rectangle.

Note: do not close the map created using Honeyeater records as it will be used later in the tutorial.

Introducing the VECTOR data type

The VECTOR data type is similar to the POINT type except that each entity does not consist of a single point but rather a vector defined by a series of points (vertices). In this example, named 'Wild and Scenic Rivers', a DBASE IV file is linked to a WinERMS vectors variable.

9. Select New Map and choose the Top tab. Select the 'Wild & Scenic Rivers' variable, choose the first five categories and click on OK.

Note the VECTOR data type icon in the variable list to the left of 'Wild & Scenic Rivers'.

10. Click on the Options tab to activate it. Click on the Zoom area button to display the Select Zoom Area dialog window.

11. Define a zoom area as follows: double click in the Minimum Easting box, and type the value 400000. Now press the Tab key and type 450000 in the Maximum Easting box. Press the Tab key and type 800000 into the Minimum Northing box. Press the Tab key and type 850000 into the Maximum Northing box. Finally, press the Enter key or click on OK to register the selection. Click on OK to display the map.

Using the Tab key to navigate through a series of edit boxes as described above is a good way to enter a collection of data into a dialog window.

12. Carry out point & click type queries and some region type queries as described in the POINTS section of this tutorial. Note that the operations and results are much the same as with the POINT data type.

Using POINTS and VECTORS on the same map

13. Select Tile from the Window menu to redisplay both the POINT and VECTOR maps side by side. To improve the size of the map display in each window, turn off the legends of both maps. To turn off a legend click on the map while holding down the left mouse button and select Legend from the Options menu or position the mouse pointer over the legend and use the Quick Menu to disable the legend.

14. Next, copy some of the specifications from the VECTOR map to the POINTS map. This is done by selecting the VECTOR map and choosing Copy Specification from the Edit menu to display the 'Copy Specification to Clipboard' window. Use the left mouse button to select Top, Zoom Area and Top Colour so that the adjacent check box has an 'X' in it. Then select OK to copy your chosen specifications to the clipboard.

15. Use the left mouse button to select the POINTS map. This will be the destination for the paste operation. Choose Paste Contents from the Edit menu.

Note that you have now created a composite map with 'Honeyeater Records' as the base layer and 'Wild & Scenic Rivers' as the top layer. Furthermore, your user defined zoom area has also been pasted. At this stage close the original VECTOR map as we will be using only the composite map in the next part of the tutorial.

16. Maximise the map and select Legend from the Options menu to provide a better view.

17. Now carry out some point & click or region type queries as described in the POINTS section.

Note that the results you obtain refer ONLY to the 'Honeyeater Records' in the base layer. Point & click and Region type DBMS queries can operate on only ONE layer at a time. If only one of the new data types occurs on a map, then the DBMS lookup will default to that layer whether it is Base or Top.

Introducing the POLYGON data type

Entities within the POLYGON data type are defined by a vector boundary and a centroid (label) point. As with the point and vector examples, a DBMS table is linked to the polygon variable, 'Service Estate'.

20. Close the composite map that you produced in the previous section and open a new map.

21. Select the Base tab, select 'Service Estate' and select all categories by double clicking on the variable.

Note that this type has it's own icon to distinguish it from the other WinERMS data types.

22. Select the Options tab, click on the Zoom Area button and choose 'Southern Section' as the zoom area for this map. Click on OK twice to display the map.

23. Zoom in and out of some areas of interest to get a closer view of the various polygons that are displayed.

24. Carry out some point & click and region type queries. Note that this type of query is basically the same as for the POINT and VECTOR data types.

We will now carry out a database query based on particular attribute criteria. Note that this facility is also available for POINT and VECTOR data types.

25. Choose Edit map and select the Base Layer tab. Now click on the SQL ... button to display the 'Build DBMS Query' window.

The 'Build DBMS Query' window allows the user to produce a DBMS query by selecting a field, an operator for the expression, and a value. These individual expressions can then be connected by applying the Boolean connectors AND or OR by clicking on their respective buttons.

For this example, we wish to display only those polygons that fall within the Hunter district. This is appropriate given that the zoom area selected in step 22 covers most of this district.

26. Firstly, select 'DISTRICT' from the Fields list. Note that a listing of the possible values for this field appears in the Value list. Secondly, select the '=' operator and finally select 'Hunter' from the Value list. Now click on OK to display the 'SQL Result Name' window. Type in 'Hunter Service Estate' as the name for this query result and click on OK twice to redisplay the map.

The method that you applied is known as 'query by example'. Note that you can still use the point & click or region type query to obtain further information on each of the spatial entities selected by SQL query. Next, reduce the items displayed even further by restricting the entities selected from the database to those reserves of a specified total area (ha).

This will demonstrate the linking of SQL expressions through the use of Boolean operators in the query by example window.

27. Edit the current map via the Base tab and SQL button to redisplay the query by example window as above. Select "DISTRICT = "Hunter" as described above. Now click on the AND button and select the expression "AREA_HA > 19272". Click on the AND button again and select the expression "AREA_HA < 92596".

If you want to edit the SQL expression that you just produced, click on the Edit SQL... button. Click on OK once you are happy with the expression. If you wish to redo the query at this point, click on the New Query button to clear the previous one.

28. Click on OK to display the Overlay Name window. Type in a new name or just press the Enter key or select OK to register the new user defined variable.

Note that by not typing an Overlay Name into the text box, WinERMS will simply refer to your Current Selection in the Map Specification window as "SQL Query Result".

29. Click on OK in the Map Specification window to redisplay the map.

30. Try some point & click or region type queries. You should find that the only polygons selected form part of either Myall Lakes NP or Barrington Tops NP.

Display and colour selection options for the new data types

Each of the new data types has two or more components that can be displayed on a map. All three types can display 'centroid' symbols and 'labels'. The vector and polygon types also have 'vector' and 'gridcell' components. The gridcell component for a vector variable represents all the gridcells that the vector features pass through, whereas for a polygon variable it represents all the gridcells contained within the polygon features. By default, the gridcell component of vector and polygon variables is not displayed. Activating the gridcell component of a polygon layer is an easy way of shading polygons. Selection of the components to be displayed and control of their colour and style is achieved via the Colour button in the Base or Top Layer tab. Click on the Colour button to display the Category Colour/Style dialog window.

In the bottom left hand corner of the dialog box is the 'Display' group. By selecting any combination of the Centroids, Labels, Vectors or Gridcells, you can define the components displayed. Note that the map redisplay speed will be enhanced by NOT having Gridcells turned on. If you wish to have Gridcells displayed, then set up all the other display parameters first and once you are happy with the display, then turn the Gridcells on. Since the POINT data type does not include Vectors or Gridcells, these will be greyed out in the 'Set Colour For' and 'Display' groups if a POINT variable display is being edited.

To the right of the 'Display' group are the 'Set Colour For' tab panels. By clicking on any of the panel tabs, the colour icon to the left of each category in the Categories list will alter to reflect the component being edited.

Clicking on the 'Centroid' tab panel will display the centroid and it's currently selected colour. This can be altered by selecting a category or categories and choosing a colour(s) from the available palette. The advanced colour selection features discussed in tutorial 2 may be applied here too. The Symbol list box is used to select a new centroid symbol from the ten available types. These are basic geometric symbols that have filled and unfilled variants. The display size of these centroids can be selected from the Size list box. Choosing a size is the same as selecting a point size for a font. If the default sizes are not appropriate, then you can define your own by typing an integer value into the list box.

Clicking on the 'Label' tab panel will display a 'T' next to each category. The display colour for the label can now be selected from the palette. To choose the font that you wish to use for a particular category's label, click on the Label Font button to display a standard Microsoft Windows dialog window. Here you can select the font style, it's display attributes (normal, bold, italic or bold italic) and the font point size.

Clicking on the 'Vector' tab panel will display the line colour, the line type and its weight next to the category name. The colour may be edited as usual with the palette. The line type and weight may be selected from a set of eleven styles in the Pattern list box.

Clicking on the 'Fill' tab panel will display the gridcell colour and styles. This is exactly the same as with any gridcell variable so refer back to the relevant sections of tutorials 1 and 2 for more information.

31. Try changing the way in which polygons are displayed in the current map using the above techniques.

Tutorial 4: Enhanced Boolean overlaying in WinERMS

This tutorial is in three parts. These parts introduce a number of enhancements to Boolean overlaying in WinERMS.

If you have any map views currently on the screen, then close them in preparation for this tutorial.

Using a new data type in a Boolean overlay

This section uses the new Vector data type in a Boolean overlay to create a domain. The domain is applied over a gridcell base layer, and a Vector top layer.

1. Select New Map to display the Map Specification dialog window.

2. Click on the Domain tab to activate it. Click on the Domain button to display the Domain Selection window. Click on the Boolean button to display the Boolean Overlay window.

3. Select the Wild & Scenic Rivers variable and click on the Add button to display the Boolean Categories window.

4. Choose the 'RIVER 4' item from the categories list box.

5. Select on the 'Generate Zone of Proximity' button and select the 4000m item from the Maximum list.

6. Choose OK. The Overlay Name window is displayed. Type in a name or just click on OK to create the overlay. The mouse pointer will change to an hourglass cursor while the overlay is created. You will then be returned to the Map Specification dialog window.

In steps 2 to 6, you created a 4km buffer zone about River 4 (the Nymboida River) which will be used as a Domain to mask out all data that do NOT fall within this area.

Create a Base Layer

7. Click on the Base tab to activate it. Click on the Base Layer button to display the Select Base Layer dialog window.

8. Choose the Land Tenure variable, and select all the categories. Choose OK to return to the Map Specification window.
    (short-cut: double-click on a variable to select all its categories and return to the Map Specification window)

Create a Top Layer

9. Choose the Top tab, and select the Top Layer button to display the Select Top Layer window.

10. Select the 'Wild & Scenic Rivers' variable , and choose the 'RIVER 4' category. Choose OK to return to the Map Specification dialog window. In the Map Specification dialog choose the OK button to display the map.

11. Zoom into the area around the displayed buffer zone and maximise the map to show more detail. (You can get more details about the sections of the River via a Point & Click query, or a Region query as described in tutorial 3).

You have completed section one of the tutorial. Close the map view and continue with the next section.

Using the Extended Boolean Overlay Capabilities of WinERMS

This part of the tutorial will use the extended boolean overlay features of WinERMS to predict distribution of a hypothetical plant species given particular habitat requirements.

The habitat of our species is identified as being either Moist Open Forest on a Basic Igneous geology or Rainforest. Suitable habitat is also confined to elevations greater than 900m.

In DOS E-RMS, such an overlay would not be possible to create directly, but would require the creation of a number of temporary variables.

In WinERMS, the overlay can be created directly by using the extended Boolean functionality.

The Boolean equation that needs to be solved in order to predict the habitat is as follows:

Elevation > 900m AND (Rainforest OR (Moist Open Forest AND Basic Igneous))

A logical approach to solving Boolean equations such as this is to work from the innermost part of the expression to the outermost part. WinERMS takes care of the creation and deletion of temporary variables needed to accomplish this task.

12. From the Map menu, choose New Map

13. Choose the Base tab, and click on the Base Layer button to display the Select Base Layer dialog window. Click on the Boolean button to display the Boolean Overlay dialog window.

    First we solve the innermost expression. That is, we do a Boolean Overlay of Moist Open Forest Vegetation AND Basic Igneous Geology.

14. Select the Vegetation Systems (Landsat TM) variable and click on the Add... button to display the Boolean Categories dialog window. Select the Moist Open Forest category and click on OK to return to the Boolean Overlay window. Now select the Geology (Lithological Classes) variable and again click on the Add... button to display the Boolean Category dialog window. Select the Basic Igneous Rocks category and click on OK to return to the Boolean Overlay window.

    Note that the Result list now contains the Vegetation Systems and Geology variables.

15. Click on the <<< AND button to perform this initial boolean overlay.

    Note that a new variable called Temporary1 appears in the variable list.

    Now we will solve the next stage of the equation by ORing the Rainforest category of Vegetation Systems with Temporary1.

16. Select the Vegatation Systems variable and click on the Add.. button to display the Boolean Categories window. Select the Rainforest category and click on OK to return to the Boolean Overlay window. Select the Temporary1 variable and click on the Add... button to display the Boolean Node window. Click on OK to register the selection and return to the Boolean Overlay window.

Note that the Result list shows the Vegetation Systems variable plus the Temporary1 variable.

17. Click on the <<< OR button to produce a new temporary variable. Note that this new variable, called Temporary2 appears in the variable list.

    We solve the final part of the equation by ANDing the Elevation classes above 900m with Temporary2 to create our final result.

18. Select the Elevation (100m classes) variable and click on the Add... button to display the Boolean Categories dialog window. Select all elevation classes greater than or equal to 900m and click on OK to return to the Boolean Overlay window.

19. Select the Temporary2 variable and click on the Add... button to display the Boolean Node window. Click on OK to register the selection. Note that by selecting OK, all the variables in the right hand list box are ANDed together by default.

20. Now finally click on OK to to accept the Boolean overlay and display the Overlay Name window. Either type in a name and press Enter, or just click on OK to create the Extended Boolean Overlay. The mouse pointer will change to an Hourglass while the Boolean Overlay is built.

21. Click on OK to display the predicted habitat that you just created.

Tutorial 5: Printing a map from WinERMS

Tutorial 5 introduces you to printing hardcopy maps from WinERMS. The tutorial focuses on features for enhancing map presentation and setting up the map and legend to produce a good quality hardcopy.

Creating the WinERMS map.

The primary components of the map are an elevation base layer and a Service Estate top layer (of the polygon data type). Line features are used to enhance the base and top layers.

Set up a BASE Layer

1. Select New Map and choose the Base tab. Select Base Layer and choose all categories of the Elevation variable by double clicking on this item in the variable list box. Select OK.

If you are working with a colour printer, you will need to edit the colours to increase their luminance. This will result in much better definition between the base and top layers. To do this, click on the Colour button to display the Category Colour/Style dialog window and then click on the Ramp... button to display the Colour Ramping dialog window.

Click on the Start Colour Detail... button to display the Colour Detail dialog window. Enter the value 215 in the Lum text box. Notice that the slider gadget next to the colour selection palette moves upward towards the white end of the scale. Click on OK to return to the Colour Ramping dialog window.

Next, click on the End Colour Detail... button to display the Colour Detail dialog window. Carry out the same operation to increase the luminance of the end colour. Click on OK to return to the Colour Ramping dialog window.

While the colour ramp has been maintained the increase in luminescence has resulted in more subtle colours.

Now click on the OK button twice to return to the Map Specification dialog window.

Set up a TOP Layer

2. Click on the Top tab to activate it. Click on the Top Layer... button to display the Select Top Layer dialog window. Click once on the Service Estate POLYGON variable. Select the National Parks and Nature Reserves categories by holding down the left mouse button and dragging the cursor over them.

3. Select OK to return to the Map Specification dialog window and click on the Colour... button to display the Category Colour/Style dialog window. Ensure that the Centroids tab panel is selected.

4. Select both the National Park and Nature Reserve categories in the list box. Set both categories to be displayed in black by clicking on the black colour box in the palette. Then set their point size to 5 in the Size list box.

Note that the operations so far have applied to both categories. The next operation applies to individual categories only. Therefore, select the National Park category on its own first.

5. The default symbol used for POLYGON centroids is the filled triangle. Retain this as the centroid symbol for the National Parks category.

6. Select the Nature Reserve category in the list box and choose the open triangle symbol from the Pattern list box.

The next step is to modify the POLYGON label. Select the Label Tab Panel. Select both categories in the category list box. Note the 'T' icon next to the items in the list box.

7. Click on the Label Font... button to display the Font dialog window. Select an 8 Point Arial Font in a Regular style and click on OK to return to the Colour Category/Style dialog box.

Next select the vector tab panel, and select both categories in the category list box. Note that the default single thickness line type is displayed next the categories in the list box.

8. In the Weight list box, select the 2pt item. Note that the change is reflected in the displayed lines next to the items in the category list.

The final POLYGON component to set up is the Gridcell display. Select the Fill tab panel. Note how the display next to each item in the list box has changed to look the same as for any grid cell variable. We will be using black for both categories but a different hatch pattern for each category. Given that we currently have both categories selected, choose the black colour from the palette to set the colour. Now we need to select each category separately in turn for the hatch pattern.

9. Choose the National Park category only. Select the fourth item, a coarse 45 degree angle hatch, from the Pattern list box. Now choose the Nature Reserve category and select the seventh item, a coarse 90 degree hatch from the Pattern list box.

Note that the new hatch patterns are displayed next to their respective categories.

10. In the Display group, make sure that ALL the check boxes are selected for the map display. Click on OK to return to the Map Specification dialog window.

Set up a LINES layer

11. Click on the Lines tab to activate it. Click on the Lines Layer... button to display the Select Lines dialog window.

12. Select all of the items except the first. In the Border group option, select Map Border with Gridlines, and click on the 10,000m grid radio button to select a 10km grid resolution. Click on OK to return to the Map Specification dialog window.

13. Click on the Colour... button to display the Line Colours and Styles dialog window.

14. Select the MAP BORDER WITH FULL GRIDLINES item. In the Style list box, select the single dashed line style. ie. the second item in the list. Ensure the colour of the item is black.

15. Select the next three items in the Line list, the NEFBS Study Area Boundary, the Coastline / Estuaries and Watercourses. These should all be black with a single solid line style.

16. Select the last two items: Highways and the Major Roads. Select red from the colour palette. Select the double thickness solid line style from the Style list box.

Note that as with previous layers, altering the display colours and line styles is reflected in the list box display next to each line category.

17. Click on OK to return to the Map Specification dialog window.

Set up a map zoom area

18. Click on the Options tab to activate it. Click on the Zoom Area... button to bring up the Select Zoom Area dialog window. To define a map area, type the following AMG coordinates in the Define Zoom Area group:

- Minimum Easting: 376600
- Maximum Easting: 508000
- Minimum Northing: 700000
- Maximum Northing: 877800

Press Enter to return to the Map Specification dialog window.

19. Then click on OK to display the map.

Note that the displayed map tends to accentuate the relative thickness of the line types and POLYGON vectors. Don't worry about this as the screen does not have as fine a resolution as the printer. The final output should give good delineation between the various line colours and styles chosen.

20. Click on the Maximise button in the top right corner of the map view window to display the map at its largest so as to improve the visual detail.

Printing the WinERMS map

Select a printer

21. Choose Print Setup... from the File menu to display the Printer setup dialog window.

22. Ensure that the settings displayed in the window are appropriate for the printer that you are using. For more information on setting up printer parameters refer to your Microsoft Windows manual.

23. Set the map Orientation to Portrait because the zoom area is greater in height than in width. For this example, print your map on an A4 size sheet. Size is chosen in the Size text box within the Paper group.

24. Select OK to register the printer settings.

Position the map and legend on the printed page

25. Choose Page Setup... from the File menu to display the Page Setup dialog window.

Note that you can also access Page setup by choosing Print from the File menu and clicking the Page Setup button on the Print dialog window. Conversely,, the Print dialog window can be accessed by clicking on the Print... button on the Page Setup dialog window.

This is a good time to discuss some of the functions available in Page Setup.

Firstly the Map Scale group allows you to select map scale and the number of pages a map prints onto.In this example, we will choose the default to print the map on a single page. Page size is chosen in the Print Setup dialog window. To print your map at a particular scale click on the Scale By radio button and choose either one of the default scales displayed in the list box or type in a scale. Note that if the scale defines a map that is too large to fit on one page the map is automatically sectioned across several pages.

The middle group allows you to select whether to print the map legend or not. Use the default setting to print the legend.

The bottom group defines the margins around the map edge. It also allows you to centre the map vertically and/or horizontally on the page. Use the default settings to centre the map on the x and y axes.

26. Click on the Legend... button to display the Legend Design dialog window.

Note that this dialog window consists of tabs as in the Map Specification dialog window.

27. Click on the Title tab to activate it. Enter a title for the map and set up the title position by selecting a Justify Title radio button. Click on the Font... button to display the Font dialog window and select a 9 Point Arial Bold style font for the title.

28. Click on the Features tab to activate it. The Layers group allows you to choose which map components to include in the Legend. Select only the Top and Lines layers. Use the defaults for the columns group in order to define how the selected layers are presented in the legend. The Options group allows you to choose whether or not to print the map scale and the grid interval. Select to print the map scale but not the grid interval. Also, you can choose to have either no legend border, a single line legend border or a double line legend border. Use the default for a single line border.

29. Click on the Position tab to activate it. This allows you either print the legend on a separate page or to include the legend on the same page as the map. Select to display the legend on the same page as the map. In order not interfere with the grid numbering display, place the legend 1.7cm in and 1.4cm down from the top left hand corner of the page by entering these figures into the X and Y text boxes respectively.

30. Click on OK to return to the Page Setup dialog window. Click on the Print... button to display the Print dialog window.

The map will be constructed in computer memory before being sent to the printer. A window will appear over your map indicating percent completed. The printing process can be aborted by clicking on the cancel button while the map is being constructed in memory. When the map has been sent to the printer the status window will disappear. At this stage, you can begin working on a new map or exit from WinERMS.

Contents of WinERMS Negotiation Database for Northern Study Area

The database contains data layers to be used in Interim Assessment negotiations for all Northern Negotiation Regions (i.e. N1 to N6). These data layers are being used to create the 'compartment by feature' matrix employed by the interactive conservation planning tool. The derived matrix and the conservation planning software are not included in the provided database. Reservation targets for the conservation features are also not included.

Data for all six Negotiation Regions are stored in a single WinERMS database covering the entire Northern Study Area (at 100m grid resolution). The user can either view data layers for the entire Northern Study Area, or zoom in to any Negotiation Region of interest. (a___ 'predefined zoom area' has been specified for each Negotiation Region).

At the time of initial supply (15/4/96) the database contains data layers for all conservation features to be used in the Interim Assessment negotiations (forest types, old growth, species models, species locality records). The database does not yet include 'land unit' boundaries (for compartments and other tenure classes) or the wood resource data associated with land units. These layers are still being prepared by State Forests and will be supplied as additions to the WinERMS database as they progressively become available for Negotiation Areas, with priority given to areas scheduled for the first week of negotiations (N1 and N2).

The data layers provided in the database are described below. Data quality statements are currently being prepared for all of these layers, and will be provided when available.

Grid Cell, Point and Polygon Variables

Forest Types

Each category of this grid cell variable contains the extant distribution of a Forest Type (including, where appropriate, subtypes endorsed by the Flora Panel). The data in the variable are a mixture of real Forest Type mapping, other fine-scale vegetation mapping converted to Forest Types, and predictive modelling where vegetation mapping was not available. The *Coverage of Forest Type Mapping* variable indicates which areas are based on real vegetation mapping as opposed to predictive modelling.

Each grid cell is assigned to a single pure Forest Type. Where two or more Forest Types have been mapped, or predicted, as occurring in an area then these types are randomly allocated to grid cells in proportion to their probability of occurrence. For example, if an area is predicted as consisting of 80% Forest Type 163 and 20% Forest Type 150 then 80% of the grid cells in this area will be assigned to 163 and 20% to 150. Grid cells assigned to each type are distributed at random throughout the area in question. This accounts for the speckled pattern of cells in parts of the study area. Caution must be exercised in interpreting the exact location of grid cells assigned to a Forest Type in areas where more than one type has been mapped or predicted. This is especially so in areas where modelling has been used to predict Forest Type composition (see the *Coverage of Forest Type Mapping* variable). Random assignment of grid cells to Forest Types is also employed in areas mapped as a mixed Forest Type (e.g. 1/12), in which case cells are randomly assigned to the component pure types with equal probability. A similar approach has been used in areas where detailed Forest Type mapping

is not available, but State Forests have mapped broad forest classes for EIS purposes. Grid cells in these broad classes have been randomly assigned to Forest Types using estimated proportions of Forest Types occurring in each class, provided by State Forests.

Coverage of Forest Type Mapping

The two categories in this grid cell variable distinguish between areas where real Forest Type mapping was available (including mapping of broad classes by State Forests) as opposed to areas where modelling was employed to predict Forest Type composition. The variable can be used in conjunction with the *Forest Types* variable (e.g. as Base and Top layers) to facilitate interpretation of the reliability of Forest Type data in different parts of the region.

Growth Stages

This grid cell variable contains the growth stages derived from the broad old growth mapping project. The Rainforest category was derived by merging areas mapped as rainforest by the old growth project with areas mapped as rainforest in the *Forest Type* variable. The other growth stage categories were derived from mapped growth classes, forest type site quality classes and disturbance history using tabulated rules endorsed by the RACAC Conservation Working Group.

F. Type / Growth Stage (30-92)

This variable contains combinations of non-rainforest Forest Types 30 to 92, subregions and growth stages. The subregions within each Forest Type are those defined by the Flora Panel. They are not negotiation regions, but rather geographical divisions of a Forest Type for the purposes of setting reservation targets. The subregions and associated reservation targets are documented in the Flora Panel report.

Each combination of Forest Type and subregion is further divided into two categories on the basis of growth stage. The first category is old growth, as mapped in the *Growth Stages* variable, while the second category is an amalgamation of all other growth stages and the undetermined class.

The coding of categories in the variable is as follows. The first character indicates the growth stage (O=old growth, R=other). This is followed by the Forest Type number, with a subtype number in brackets if applicable. If a Forest Type has been divided into subregions then the subregion number is indicated after a slash. For example, the 'O 163(1)/2' category contains the distribution of old growth Forest Type 163 (subtype 1) within subregion 2.

F. Type / Growth Stage (93-215)

This variable is a continuation of the previous variable, for Forest Types 93 to 215.

Rainforest (with 30% spatial filter)

The single category in this variable contains the distribution of rainforest after application of a spatial filter to remove small, isolated occurrences. The filter is based on a 1km by 1km square centred on each grid cell mapped as containing rainforest. The grid cell of interest is retained by the filter only if more than 30% of cells in the 1km square also contain rainforest. This approach to identifying core areas of rainforest was formulated by the RACAC

Conservation Working Group. It should be noted, however, that the role to be played by rainforest in the Interim Assessment negotiations is not yet fully resolved. ·

The unfiltered distribution of rainforest is contained in the Rainforest category of the *Growth Stages* variable.

Extant Vegetation Cover (Landsat TM)

The single category in this variable depicts the distribution of uncleared vegetation across all land tenures within the study area, based on visual interpretation of 1:100,000 Landsat TM imagery. The data were derived from the Eastern Bushland Database established by NSW NPWS. The variable is intended to provide contextual information to negotiators, of particular relevance to reserve design (e.g. identification of potential wildlife corridors).

Frog Models

This variable contains the modelled distributions of frog species selected by the Fauna Panel for consideration in the Interim Assessment. The categories are combinations of species, subregions and predicted habitat classes. The subregions within each species are those defined by the Fauna Panel. They are not negotiation regions, but rather geographical divisions of a species for the purposes of setting reservation targets. The subregions and associated reservation targets are documented in the Fauna Panel report. The predicted habitat classes have been derived using rules formulated by the Fauna Panel, incorporating models developed by the NSW NPWS North East Forests Biodiversity Study in conjunction with expert knowledge of the association of species with Forest Types and growth stages. The habitat classes are assigned weights reflecting their relative contribution to a specified reservation target. The rules for deriving habitat classes, and the weights assigned to those classes, are documented in the Fauna Panel report.

Categories in the variable are coded with a species name, subregion number and habitat class on a 1 to 3 scale, where 1=optimum habitat, 2=sub-optimum habitat and 3=marginal habitat.

Reptile Models

As for *Frog Models.*

Bird Models

As for *Frog Models.*

Non-volant Mammal Models

As for *Frog Models.*

Bat Models

As for *Frog Models.*

Fauna Locality Records

This point variable contains locality records for all fauna species selected by the Fauna Panel for consideration in the Interim Assessment. Each category contains a combination of species

and subregion. The subregions within each species are those defined by the Fauna Panel. They are not negotiation regions, but rather geographical divisions of a species for the purposes of setting reservation targets. The subregions and associated reservation targets are documented in the Fauna Panel report. Categories are coded with a species name followed by a subregion number.

Additional information relating to each of these records is contained in a database table linked to the variable. See the accompanying installation guide for instructions on how to activate this link (only available if you have ODBC drivers installed on your computer). Once the link is activated you can double click on any displayed record to obtain further information. An explanation of the fields contained in the linked database is provided in a printed table attached to this document.

Flora Locality Records

This point variable contains locality records for all flora species selected by the Flora Panel for consideration in the Interm Assessment. The records for each species are divided into two categories. The first category (labelled with a 'mand' suffix) contains those records identified by the Flora Panel as requiring mandatory (i.e. 100%) protection. The second category (labelled with an 'other' suffix) contains those records for which only a specified percentage (less than 100%) of records need to be reserved. These categories and targets are documented in the Flora Panel report.

Additional information relating to each of the records is contained in a database table linked to the variable. See the accompanying installation guide for instructions on how to activate this link (only available if you have ODBC drivers installed on your computer). Once the link is activated you can double click on any displayed record to obtain further information. An explanation of the fields contained in the linked database is provided in a printed table attached to this document.

Towns

A point variable that may assist users in identifying locations within the study area. This is best selected as a Top Layer.

Line Layers

Major Roads

These may assist in identifying locations in the study area.

Negotiation Regions

Boundaries of Interim Assessment negotiation regions (N1 to N6). The initial version of this layer is based on coarse-scale digitising, and the boundaries do not align well with Management Area boundaries, roads, State borders etc. A refined version will be supplied when available.

1:100,000 Map Sheets

Boundaries of all 1:100,000 topographic map sheets within the study area.

1:25,000 Map Sheets

Boundaries of all 1:25,000 topographic map sheets within the study area.

Predefined Zoom Areas

Zoom areas have been predefined for each of the negotiation regions (N1 to N6). These enable the user to rapidly zoom in to a selected negotiation area. A predefined zoom area can be chosen by selecting 'Options' from the main Map Specification dialogue box, then 'Zoom Area...'.

Database fields linked to the 'FAUNA LOCALITY RECORDS' variable

FIELD NAME	DESCRIPTION
RECORD NUMBER	Key field that uniquely identifies each species record
SOURCE DATABASE	Source of the record: WDATAGIS = Atlas of NSW Wildlife held at GIS Unit Armidale ATLASUPD = Atlas of NSW Wildlife HO update (07/95) LICENSE = NEFBS.LICENSE Fauna Data Application STATE FORESTS = State Forests EIS data Records starting: "NZ-" = Other fauna data from NPWS Northern Zone Other sources may appear in this field; these indicate databases held within the NEFBS.FAUNA Data Application
SITE NUMBER	Site identifier for the locality from which the record was obtained
LOCATION	Description of site locality
RESERVE NAME	Name of the reserve (National Park, Nature Reserve, State Forest, Flora Reserve or other reserve) from where the record was obtained
ZONE	Australian Map Grid (AMG) zone number
EASTING	AMG Easting (6 digit)
NORTHING	AMG Northing (7 digit)
ACCURACY	Code for accuracy of the georeference: 1= within 10 m 2= within 100 m 3= within 1 km
ALTITUDE	Elevation (in metres) above sea level
MAP NUMBER	1:100 000 map sheet number (CMA)
CALCULATED MAP NUMBER	1:100 000 map sheet number (CMA) Calculated from the AMG Easting and Northing
FIRST DATE	First or only date of the record observation period
LAST DATE	Last date of the record observation period
RECORDER	Name of the principle data collector
CAVS CODE	Census of Australian Vertebrate Species (CAVS): Unique code for each taxa
SPECIES NAME	Name of taxon: Common names are used for birds and non-bat mammals Scientific names are used for all other fauna species
RELIABILITY	Code for the reliability of identification of the taxa recorded: 1= Specimen with public museum 2= Specimen with other collection 3= Voucher specimen used 4= Reliable or verified

Database fields linked to the 'FAUNA LOCALITY RECORDS' variable CONT.

FIELD NAME	DESCRIPTION
OBSERVATION TYPE	Method used to detect the taxa recorded: A = Stranding/beached B = Burnt C = Cat kill D = Dog kill E = Nest/roost F = Tracks, scratchings H = Hair, feathers, or skin M = Miscellaneous N = Not located O = Observed P = Scat R = Road kill S = Shot T = Trapped or netted V = Fox kill W = Heard X = In scat Y = Bone or teeth Z = In raptor/owl pellet
NUMBER	Number if individuals of the taxa recorded
BREEDING	Indicators of the breeding status associated with the record: E = Eggs J = Juveniles L = Lactating N = Nesting P = Pregnant Y = Yes, but no details - = Not breeding
LEGAL STATUS	Identifies the legal status of the fauna in NSW (as listed in the NSW NPWS Act 1974): U = unprotected P = protected V = vulnerable and rare T = threatened
TARGET_CODE	X = Indicated where the species is a target species
NOTES	Any other information relevant to the record
COMMON NAME	Common name of the taxa recorded
SCIENTIFIC NAME	Genus, species (and subspecies if recorded) of the taxa
DATASET NAME	Name of the dataset from which the record was obtained
DATA USE RESTRICTION	Restrictions on data use (conditions specified by data custodians). The provision of data must also comply with NSW NPWS Digital Data Release Policy, which may impose additional conditions of use specified within a licence agreement (see 3.1) UNRESTRICTED = Data are available to the public GOVERNMENT DEPARTMENTS ONLY = Data are only available for use by NSW State Govt departments SERVICE USE ONLY = Data are only available for use within the NSW NPWS PROJECT SPECIFIC ONLY = Data to be used only for the IAP (not for public release)
CATEGORY	The species category name used for the fauna point locality variable

Database fields linked to the 'FLORA LOCALITY RECORDS' variable

FIELD NAME	DESCRIPTION
RECORD NUMBER	Key field that uniquely identifies each species record
SOURCE DATABASE	Source of the record: AGIS FLORA/SURVEY = AGIS FLORA data application AGIS SIGPLANTS = AGIS SIGPLANTS data application HO SIGPLANTS = Head Office SIGPLANTS data application STATE FORESTS = State Forests EIS data NZ EXTRA RECORDS = Other plants data from NPWS Northern Zone
SITE NUMBER	Site identifier for the locality from which the record was obtained
SOURCE FILE	Source of the data (applies to State Forests data only)
LOCATION	Description of site locality
RESERVE NAME	Name of the reserve (National Park, Nature Reserve, State Forest, Flora Reserve or other reserve) from where the record was obtained
ZONE	Australian Map Grid (AMG) zone number
EASTING	AMG Easting (6 digit)
NORTHING	AMG Northing (7 digit)
ACCURACY	Code for accuracy of the georeference: 1= within 10 m 2= within 100 m 3= within 1 km
MAP NAME	1:100 000 map sheet number or name (CMA)
FIRST DATE	First or only date of the record observation period
LAST DATE	Last date of the record observation period
RECORDER	Name of the principle data collector
QUADRAT	Dimensions of the survey plot (metres)
CAPS CODE	Census of Australian Plant Species (CAPS): Unique code for each taxa
SCIENTIFIC NAME	Scientific names are used for all plant species
SIGNIFICANCE CATEGORY	Categories of Conservation Significance in Upper N-E NSW (Sherringham and Westaway, 1995) eg Carex capillacea "1,(3RC-+),7,8N" where characters outside the '()' refer to Categories of Conservation Significance (with 1 always preceding the '()' and 2 to 9 proceeding the '()') and those inside the '()' refer to Categories of ROTAP (Briggs and Leigh, 1988) (see below) 1 = ROTAP Species (Rare or threatened Australian plant) (..) = ROTAP category (see Briggs and Leigh, 1988) (see below) 2 = Uncommon throughout distribution 3 = Rare in NSW 4 = Regionally uncommon 5 = Depleted habitat / sparse 6 = Locally endemic 7 = Disjunct 8 = Distributional limits: N = Northern limit, S = Southern limit 9 = Atypical habitat

Database fields linked to the 'FLORA LOCALITY RECORDS' variable CONT.

FIELD NAME	DESCRIPTION
	Categories of ROTAP (Rare or Threatened Australian Plants(Briggs and Liegh, 1988)) species eg Carex capillacea (3RC-+) (from above) where; (3 = Distribution Category; R = Conservation Status, C,-,+ = Conservation Reservation)
	Distribution Category
	1 = Species known only from the type collection
	2 = Species with a very restricted distribution and restricted to a geographic range < 100 km
	3 = Species with a geographic range > 100 km but occurring only in small populations restricted to highly specific and localised habitats
	Conservation Status
	X = Presumed extinct
	E = Endangered
	V = Vulnerable
	R = Rare
	K = Poorly known
	Conservation Reservation
	C = The taxa is known from a conservation reserve, NP/NR etc.
	a = This indicates that the species is considered adequately reserved with a population of > or = 100 plants known to occur within conservation reserves
	i = The taxa is considered inadequately reserved
	- = The species has been recorded within a conservation reserve but that the population size within the reserve is unknown
	+ = Species which have a distribution extending beyond the Australian continent
	t = The species population is known to occur solely within conservation reserves
COVER ABUNDANCE	Code for cover Abundance for individual species - either:
	1 = sparse < 5%
	2 = any number < 5%
	3 = 5 - 25%
	4 = 25 - 50%
	5 = 50 - 75%
	6 = 75 - 100%
	or:
	VC = very common
	C = common
	F = frequent
	O = occasional
	R = rare
RELIABILITY	Code for the reliability of identification of the taxa recorded:
	1= Specimen with public museum
	2= Specimen with other collection
	3= Voucher specimen used
	4= Reliable or verified
SURVEY	Survey from which the record was obtained

Database fields linked to the 'FLORA LOCALITY RECORDS' variable CONT.

FIELD NAME	DESCRIPTION
DATA USE RESTRICTION	Restrictions on data use (conditions specified by data custodians). The provision of data must also comply with NSW NPWS Digital Data Release Policy, which may impose additional conditions of use specified within a licence agreement (see 3.1) UNRESTRICTED = Data are available to the public GOVERNMENT = Data are only available for use by NSW State Government departments NPWS = Data are only available for use within the NSW NPWS PROJECT ONLY = Data to be used only for the IAP (not for public release)
LEGAL STATUS TSCA 1995	Identifies the legal status of the flora in NSW (as listed in the NSW TSC Act 1995). 1E = Schedule 1 Part 1 Endangered species 1X = Schedule 1 Part 4 Species presumed extinct 2V = Schedule 2 Vulnerable species
CATEGORY	The species category name used for the fauna point locality variable Records ending "_Mand." = For irreplaceable special sites which require preferential reservation Records ending "_Other" = For all other sites

Installation of WinERMS Database for Northern Study Area

Installing the Northern Study Area Negotiation Database involves the following steps:

- copying the database files onto a computer with WinERMS installed
- directing WinERMS to the database
- establishing the ODBC linkage between the WinERMS database and the attribute tables for fauna and flora point locality records (this is optional)

Create a new directory for the WinERMS database on your computer, and copy all supplied database files (including subdirectories) to this directory. You can name the directory whatever you like (e.g. IAP_NSA).

Once the directory has been created and all files copied, the database can be used by WinERMS. Open WinERMS from within the Windows Program Manager, select File, then Open Database, Add a database, and Browse for the directory containing the database. Select this directory and then select the AREA.IND file. OK your selection and Open the database. The database will now appear in the list of available databases whenever Open Database is selected.

To establish an ODBC linkage between the WinERMS database and attribute tables for fauna and flora point locality records, you need to already have ODBC drivers installed on your computer. If Microsoft Office is loaded then this facility should be available. The establishment of an ODBC linkage for the point locality data is optional. If you do not have ODBC capability you can still map point locality records but will not have access to the additional information stored in the attribute tables. From Program Manager, enter Control Panel, and select ODBC. Add a new database, select 'Access Data' as a data source, enter Fauna as the data source name and then Select Database. Set the database path in the 'Select Database' window and then select OK. For fauna this path must be set as \data\iapfauna.mdb beneath the directory containing the WinERMS Northern Study Area database. For example, if you loaded the WinERMS database into c:\iap_nsa then the path should specified as c:\iap_nsa\data\iapfauna.mdb.

This procedure needs to be repeated for the flora attribute table. The data source name needs to be Flora and the path set as \data\iapplant.mdb beneath the directory containing the Northern Study Area database.