Roadside Survey Database

User Manual

Version 1

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1 Background

Wind and water erosion are potent reminders of inappropriate land management. However, it is difficult to measure the distribution of erosion over large areas. In addition, any evidence of erosion can be quickly hidden by growing vegetation or cultivation. By monitoring the factors that lead to erosion it is possibly to designate a Hazard risk which is the potential for erosion to occur on a particular site. The Hazard can be used to predict the area at risk of eroding under the right weather conditions.

Roadside surveys have been used by several organisations as a rapid and viable monitoring technique to determine the extent of and potential of erosion across large area of the landscape. The survey involves observations of ground cover, management practices and the erosion status of paddocks adjacent to the road. However each organisation has adopted a slightly different method according to its state and/ or project objectives. In order to standardise between organisation, a short term project was recommended under the Monitoring and Evaluation Reporting and Improvement (MERI) framework.

The specific objectives of this project were to;

1. Develop a manual of nationally consistent minimum standards for roadside survey and ground reference site monitoring of wind/water erosion (including hazard) appropriate for agricultural land use systems (Forward 2009)
2. Review field databases currently used by state agencies to navigate, capture and manage data during roadside surveys (eg. LandMAPT – NSW) and identify minimum specifications for a nationally compatible field database for monitoring of wind and water erosion (Murphy 2009).
3. Develop a prototype national database (eg. based on CSIRO Land & Water Australian Soil Resource Information System (ASRIS)) suitable to collate field data from roadside survey and ground reference sites.

This document is the User Manual for the suggested Roadside Survey Database developed by Griffin (2009)

Murphy's (2009) recommendations were made after the review of the different databases. He concluded that a suitable field database would;

1. run as a standalone executable on both field laptop PC and desktop PC
2. have built in tools to establish a survey route, including the accurate capture of site locations and potential to modify them as necessary
3. accurately navigate to fixed site locations so that data values are collected from the same location each sample time
4. accommodate key data fields that align with those in the national field methods manual proposed by Forward (2009)
5. display historic data values for a site when new observations are being made
6. check for data entry errors at the time of data entry to ensure integrity of the data
7. have the functionality to graphically report survey results and summarise them according to transect or region of survey, and
8. standard export of data to national repository.

The database is designed for an Agency with multiple users.

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3 Database installation

3.1 Database Components

The Roadside Survey Database is a MS Access file split into a Frontend and Backend. It is supported by an Excel template and two documents.

3.1.1 The Frontend

The Frontend is an mdb file called RoadsideSurvey.mdb and has the data entry forms and the reporting tools.

3.1.2 The Backend

The Backend (or data file) is an mdb file designed purely to store the data. There is one Master and may be as many Local files as an agency requires.

Master Backend

MasterRoadsideSurvey_dat.mdb

One Backend file within an agency will be designated as the Master and will hold all the data for the agency. The system has been designed to “check out” (lock) transects that are being added to in the field. These transects in the Master can not be edited while they are checked out. Once the data from the Local checked out version has been uploaded to the Master, the data is again available for editing. (Editing of Master requires administrative privilege.)

Local Backend

The default name of the Local Backend is RoadsideSurvey_dat.mdb

There may be several copies of the Backend in use in an agency. They will be used for data collection and review and may have any name. After the data has been reviewed it can be loaded into the Master. Only Backends that have been checked out can be uploaded to the Master

3.1.3 Excel Template

Hazard.xlt is a template that is used to produce reports.

3.1.4 Documents

There are five documents,

- Field Manual - RoadsideErosionSurveyManual.pdf – Methods for taking field observations
- National Transfer - RSS_NationalTransferProcedure.pdf – How to transfer the data to the national database

three Database manuals

- Quick – RoadsideSurveyFieldManual.pdf – Used as a quick reference on how to use the database in the field
- Full – RoadsideSurveyUserManual.pdf – This Document
- IT – RoadsidezSurveyITManual.pdf – For IT use.

3.2 Installation

Installation involves copying files and administration of privileges etc.

3.2.1 Agency

Create a folder on a server for the Master data file with a subfolder (e.g. DataBackup) for backup copies of the Master and another subfolder (e.g. RSS_Application) with all the files required by a user. Use the folder properties to provide read and write privileges for the users.

3.2.2 Local

Copy the RSS_Application folder from the server to a convenient location on to the local machine.

The Frontend has been designed to locate and attach to files within the same folder, however, the Frontend has the ability to connect to Backends located in different folders, other computers or on a server.

[need to discuss copying data files and working online/offline]

4 Open Database / Starting

4.1 MS Access Versions

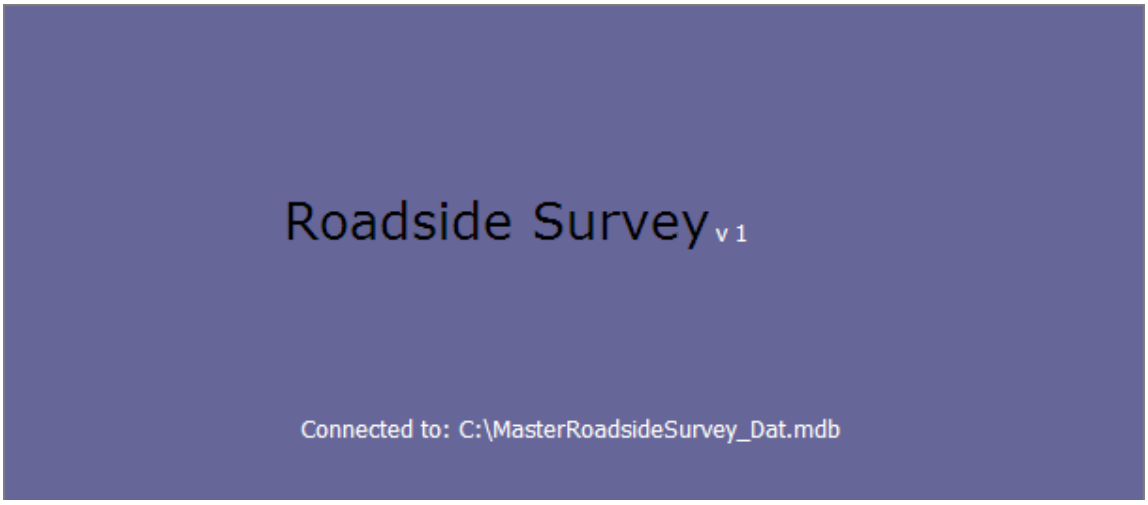
This is an MS Access 2000/2003 version. No problems have been found using 2007 so far, but some of the toolbars look different.

4.2 Opening Screen

Open the RoadSideSurvey.mdb file.

The database will attempt to connect to the last known Backend file. If it can not find the previous Backend it will attach to a file called “RoadsideSurvey_dat.mdb” in the same folder. Failing that it will prompt the user to choose a Backend.

The opening screen will show the user the version number and the file that the Frontend has connected to.



Note:

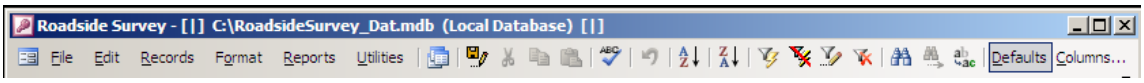
The database stores the location of the last Backend it had attached to. Whilst a copy of this stored backend is available the Frontend will continue to connect to it. Hence moving and copying the database components to a new location will not automatically result in the front end making a connection with the backend in the new location.

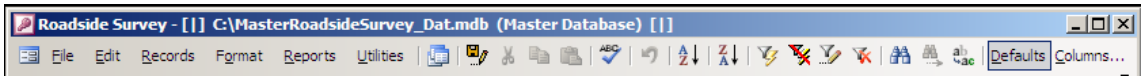
As the database will try to connect to the same Backend as it had previously connected to; moving the Frontend to a new
the Frontend will still work when it is moved or copied to a new location

4.3 Main Screen

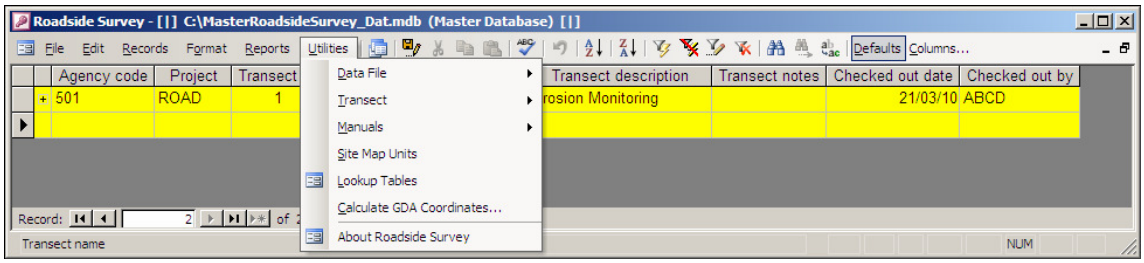
The data entry form is the main screen,. It is used for data entry, viewing previous data and has links to other functions and processes.

The title bar (top of screen) informs the user as to which Backend the Frontend has attached to, and if that file is classified as the Master or the Local file. (The Master Database needs to be specified as described in 3.5.3 DataFile -Identify Master, before the Frontend will recognise any database as the Master.)

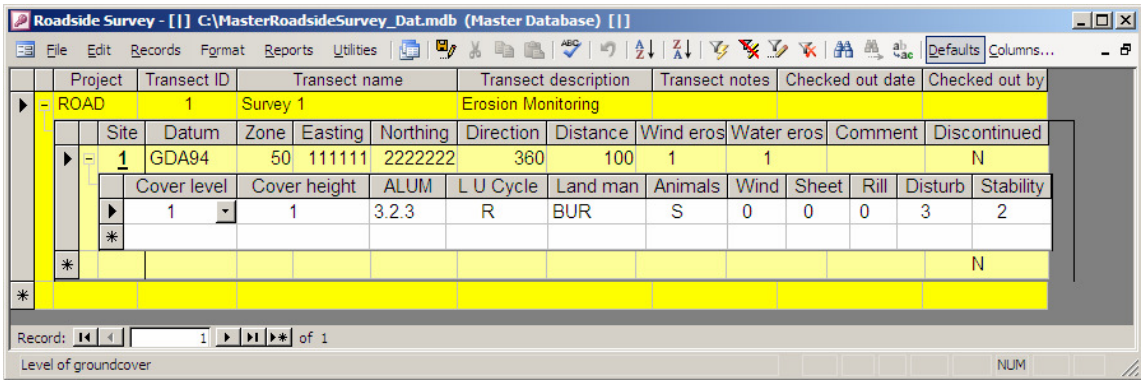




The Menu bar has a selection of menus with dropdown menu items as well as several tool bar buttons.



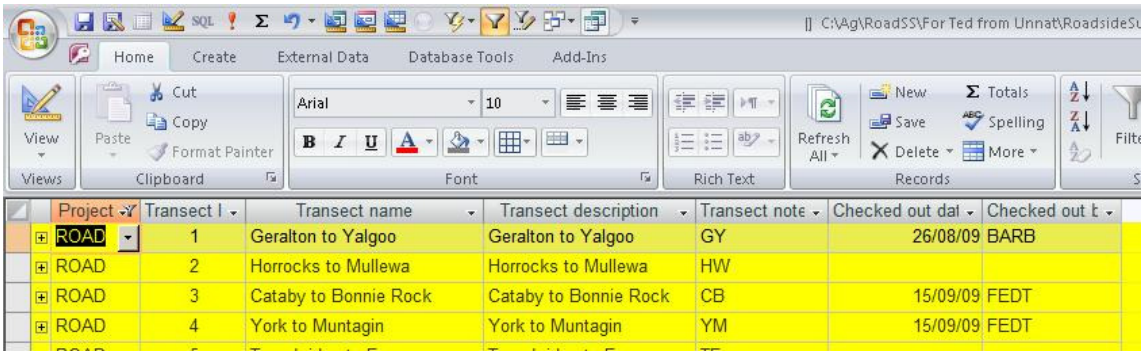
When populated, the data entry form, is expanded to show two sub data forms. The first datasheet form contains the Transect information, the second contains the site information while the third contains all the observations over time.

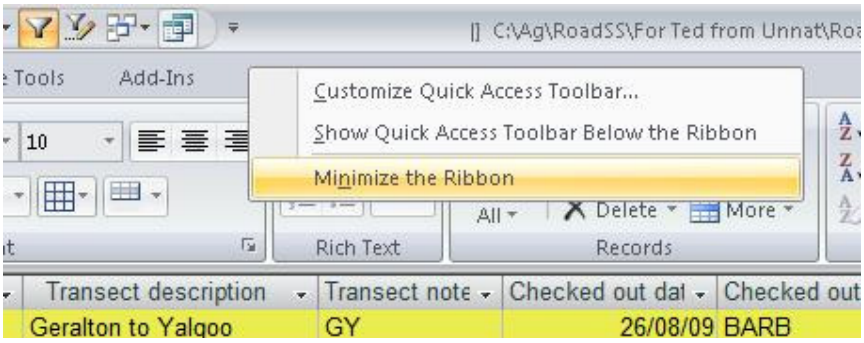


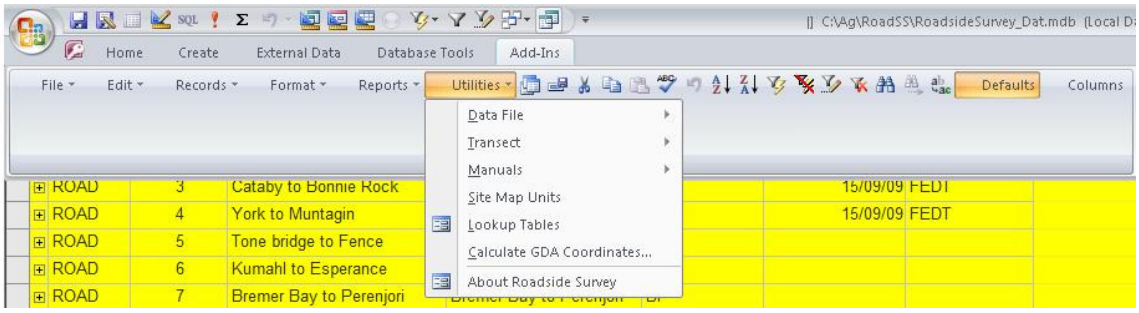
4.3.1 Form layout

The database forms have been designed to be flexible. The row and column heights can be adjusted in nearly every situation. The row height and column width can be adjusted through the use of the menu items, (Format | Row Height/ Column Width), or by clicking and dragging the row / column height/ widths to the desired size.

5 Access 2007

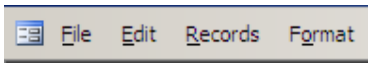






6 Menu Items

6.1 Standard Access Menu Items

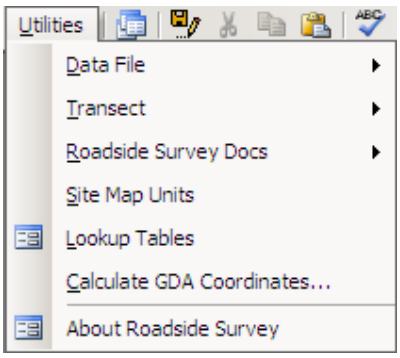


File	To save and close file
Edit	Copy, cut, past, delete etc.
Records	Filter and sort the data
Format	Edit table sizes

6.2 Custom Menu Items

Reports		Produce Charts on the data
Utilities		
	Data File	select a Backend located in a different file
	Transect	Export GPS coordinates, Upload Data, Delete Transect
	Manuals	• Database manuals (Quick, Full and IT versions) • Field manual • National Transfer
	Site Map units	View site map units for specific site
	Lookup Tables	Holds values for main tables (refer to 4.5)
	Calculate GDA Coordinates	Recalculate GPS coordinates for sites
	About Roadside Survey	Database Version Number
DataBase		Opens Database main Menu
Access Tool Buttons		Quick buttons
Defaults		Toggle the default menu on and off
Columns		Select which columns you would like to view

6.3 Utilities Menu



6.3.1 Select Datafile (Backend)

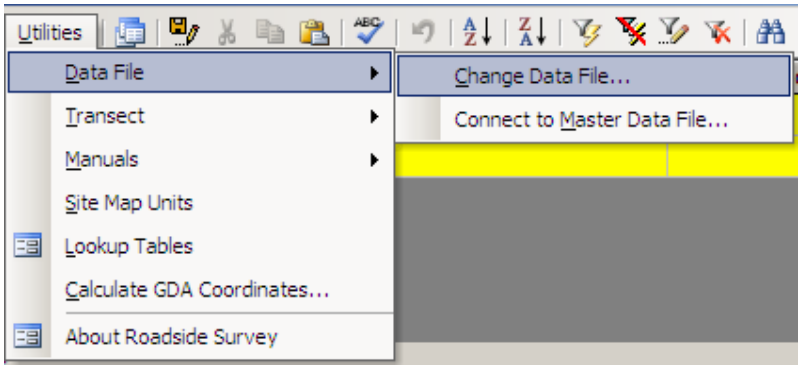
The Frontend has the ability to connect to different Backends to allow the user to view different datasets. There will be several copies of the Backend in use in an agency,

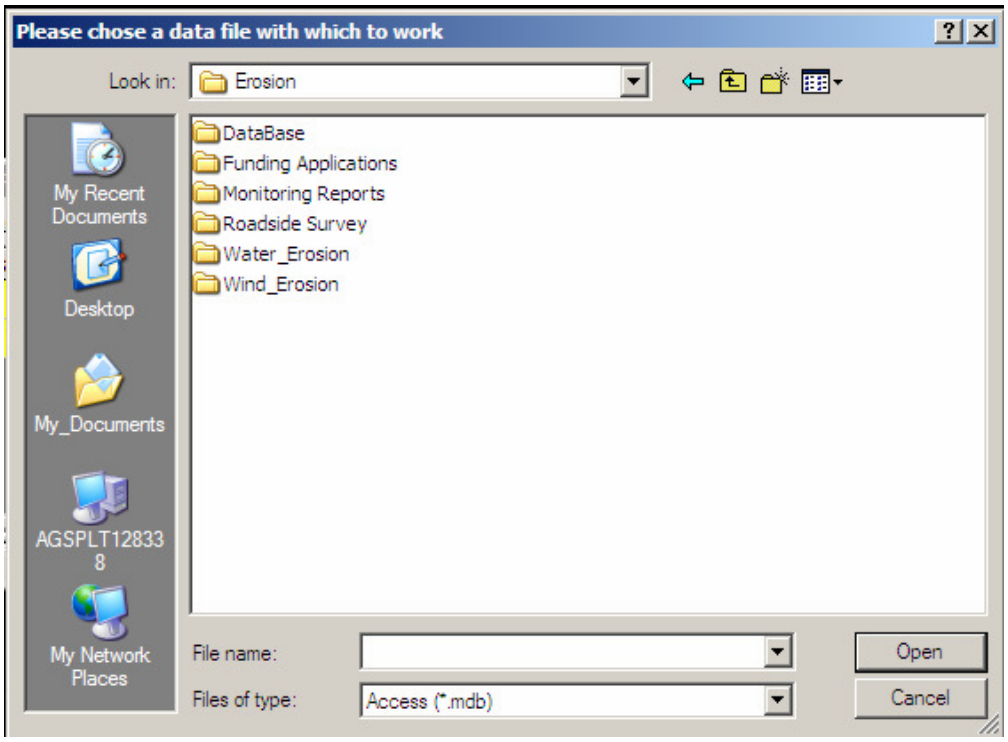
- a Master Backend contains the “complete” monitoring data set
- checked out Backends that are being used for data collection
- personal Backends for review and research.

6.3.1.1 Connect to a different Backend

****Warning**** Do not create links to other tables as it will cause the program to fail. Instead, create a new access document and link/ import the desired tables into the new database

Select *Change Data File* tab in the menu items (Utilities | Data File | Change DataFile…). Use the following screen to search for and open the desired Backend.



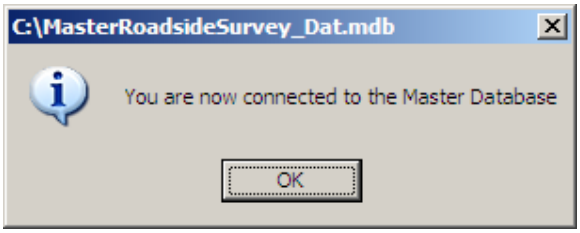


6.3.1.2 Connecting to the Master Backend

This can be done in two ways;

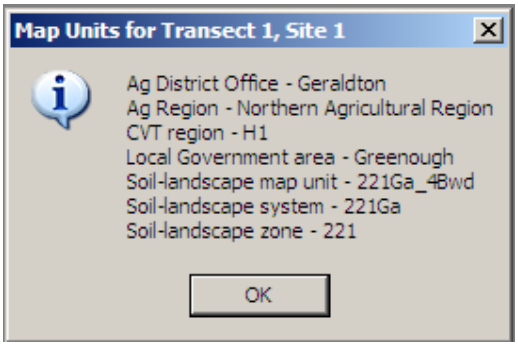
same as above, (Utilities | Data File | Change DataFile) and locating the Master Backend, or

select *Connect to Master Data* File tab in the menu items (Utilities | Data File | Connect to Master Data File…). This feature will only work once the pathway to the Master file has been specified in the *DataFile* lookup table. The following message will appear if the database has successfully connected to the Master Backend.



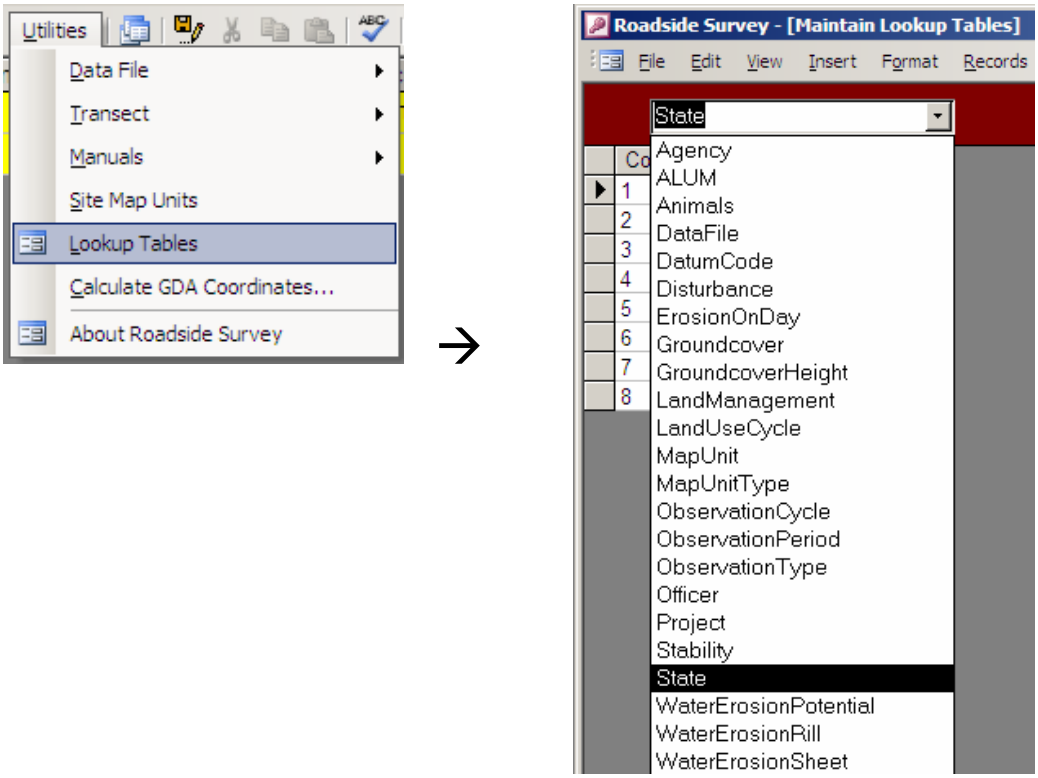
6.3.2 Site map units

To view the map unit details of a site select the Site Map Units from the Utilities menu (Utilities | Site Map Units). The popup screen will show all the map units for that particular site.



6.3.3 Lookup Tables

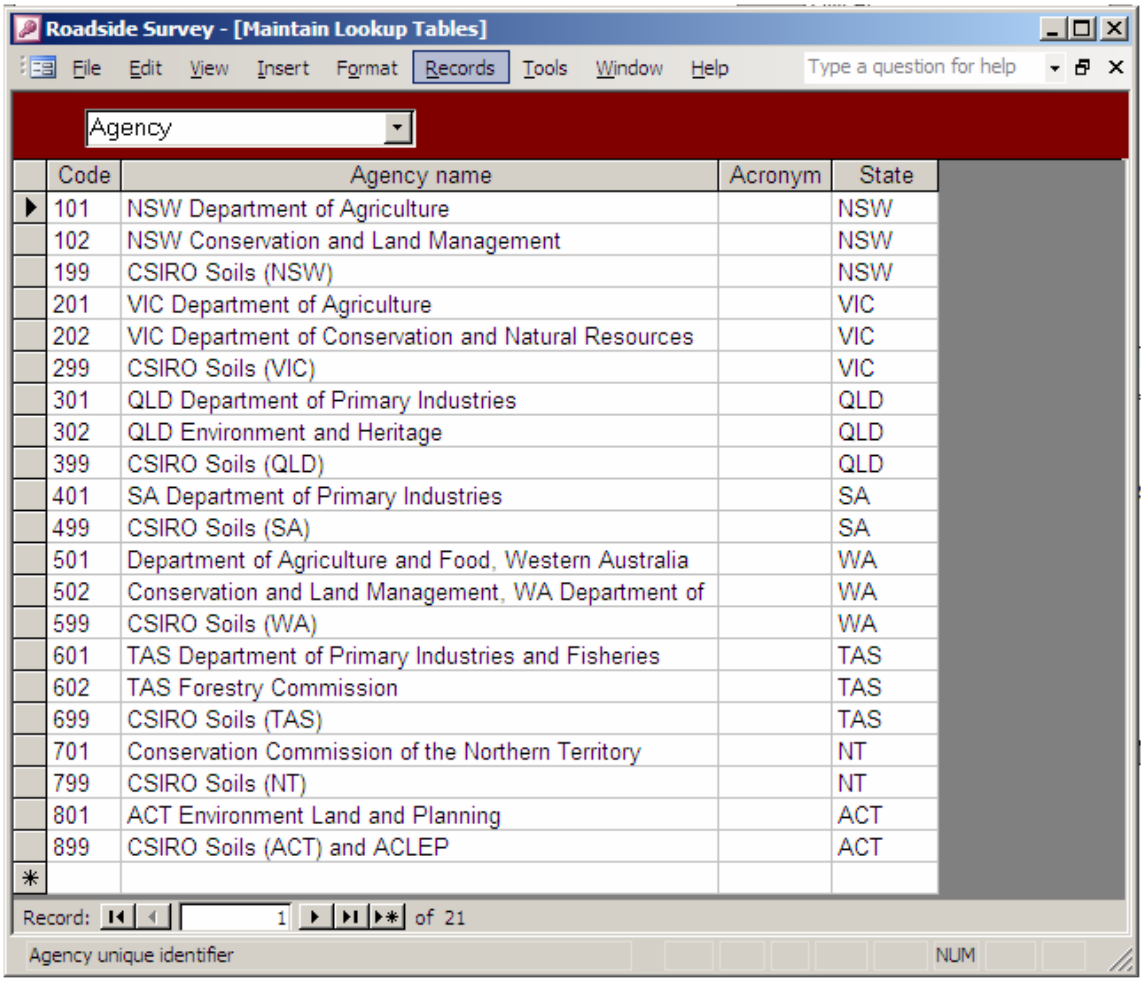
The lookup tables (Utilities | Lookup Tables) are a selection of tables which limit which data can be entered in this database. There are a variety of tables that can be viewed and some can be updated. Most tables are already populated and may not need any further data.



Some populated tables may require updating to include the latest information. The most important lookup tables are described below.

6.3.3.1 Agency

The agency is a required field and therefore each agency needs to be in this table. As the codes are maintained by ASRIS, please contact Asris@csiro.au or visit the web site http://www.asris.csiro.au for a particular agency code or to create a new one.



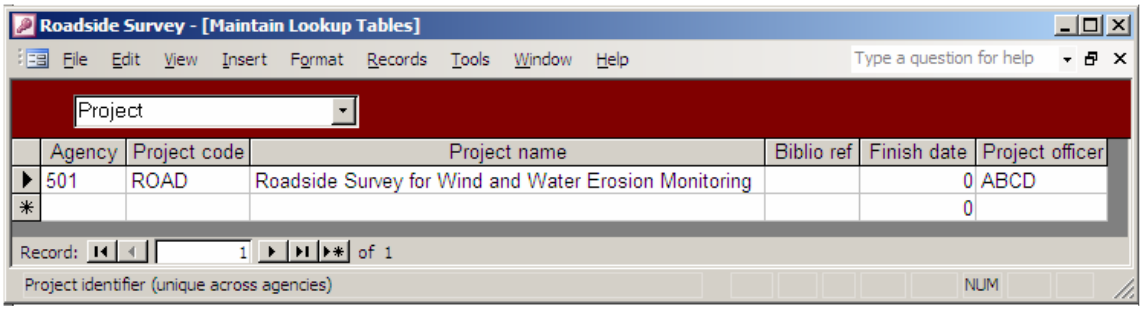
Code	Agency name	Acronym	State
101	NSW Department of Agriculture		NSW
102	NSW Conservation and Land Management		NSW
199	CSIRO Soils (NSW)		NSW
201	VIC Department of Agriculture		VIC
202	VIC Department of Conservation and Natural Resources		VIC
299	CSIRO Soils (VIC)		VIC
301	QLD Department of Primary Industries		QLD
302	QLD Environment and Heritage		QLD
399	CSIRO Soils (QLD)		QLD
401	SA Department of Primary Industries		SA
499	CSIRO Soils (SA)		SA
501	Department of Agriculture and Food, Western Australia		WA
502	Conservation and Land Management, WA Department of		WA
599	CSIRO Soils (WA)		WA
601	TAS Department of Primary Industries and Fisheries		TAS
602	TAS Forestry Commission		TAS
699	CSIRO Soils (TAS)		TAS
701	Conservation Commission of the Northern Territory		NT
799	CSIRO Soils (NT)		NT
801	ACT Environment Land and Planning		ACT
899	CSIRO Soils (ACT) and ACLEP		ACT

6.3.3.2 Project

The Project is a required field and is unique within an Agency.

Select **Project** from the drop down menu to add a new monitoring project. The term 'Road' has been used to represent the roadside survey projects in the examples provided. Project codes may be managed at an agency level for other purposes. Please refer to relevant soil or land resource administrators before creating new projects.

Please note that project Officer as a required field. The officer must be in the Officers table before attempting to create a new project.



Agency	Project code	Project name	Biblio ref	Finish date	Project officer
501	ROAD	Roadside Survey for Wind and Water Erosion Monitoring		0	ABCD
				0	

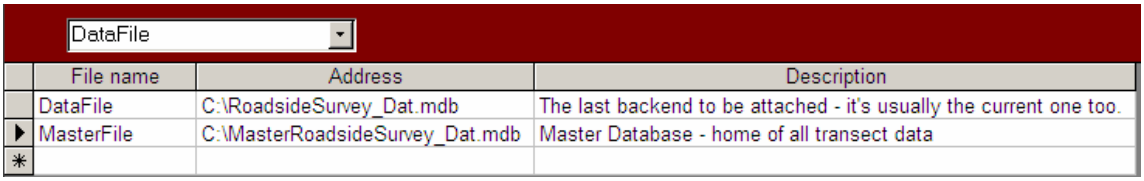
6.3.3.3 DataFile - Identify the Master

The first time the database makes a connection it may not know which file is classified as the Master Backend. Within the lookup tables (Utilities | Lookup Tables) select **DataFile** from the dropdown menu to update the pathway to the Master Backend.
There are two file types:

Datafile refers to the current Backend that is open and the corresponding path

MasterFile refers to the Master database and the corresponding path.

To specify the path to the Master Backend, the path needs to be recorded in the address column. If the Frontend is currently connected to the Master Backend the path will be displayed in the address column for the *DataFile*. Copy and paste the path to the MasterFile Address cell. Alternatively, type the path manually into the address cell



File name	Address	Description
DataFile	C:\RoadsideSurvey_Dat.mdb	The last backend to be attached - it's usually the current one too.
MasterFile	C:\MasterRoadsideSurvey_Dat.mdb	Master Database - home of all transect data

6.3.3.4 Observation Cycle

The observation cycle is used to define the 'time' (segment) of year that observations are taken. These are used instead of date to group comparable observation dates within and between years. The intervals within the annual cycle are described in terms of there being distinct growing and non growing periods, rather than such as summer, winter etc. Thus a minimum will be a different time of the year in different parts of Australia.
This has to be defined in advance of observation and preferably before monitoring has been implemented
The minimum standards for Roadside Observations require two surveys per year, at maximum ground cover, and minimum ground cover. Additional observations cycles can be added if they are required. The *ObservationCycle* has to be consistent with the *ObservationPeriod*.
The database has been set up with four default cycles: Minimum ground cover, Post seeding, Maximum ground cover, and Post harvest. If this does not suit, modify to suit the specific project, remembering only to keep logical sequence consistent with the code order.
Select **ObservationCycle** from the dropdown menu of the maintain look up table to create new or adjust the current observation cycles.

ObservationCycle

Code	Name
0	Minimum ground cover
1	Post seeding
2	Maximum ground cover
3	Post harvest
0	

6.3.3.5 Observation Period

The *Observation Period* refers to the period in which an observation was taken throughout the life of the monitoring. It is an integer and effectively it is the combination of year plus Observation Cycle. However, it provides for the start (0 value) for the Observation Cycle to start any month of the year.

Thus, the relationship between the *Observation Period* and the Observation *Cycle* needs to be carefully thought through as the *Observation Period* is one of the primary keys and is used in the naming of the X axis in the graphic outputs.

Select **ObservationPeriod** from the dropdown menu to update the following observation period fields.

Agency code relates the *Observation Period* to a particular Agency.

ID has to be in numerical order as it is used to sort the data on time period. (Acts as the x axis)

Name is the period name, i.e. Max 09 for maximum ground cover in 2009, and is used as the time label on the graphic outputs. The *Observation Period* is a primary key and will not allow for duplicate entries

Date is the start date of the *Observation Period*

Cycle is the *Observation Cycle* from above and refers to the 'time' of year the observation was taken.

ObservationPeriod

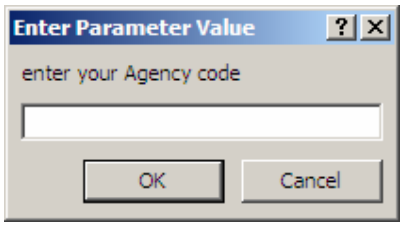
Agency code	ID	Name	Description	Date	Cycle
501	1	Decline (	2009	1/01/2009	3
501	2	Min 09	2009	1/03/2009	0
501	3	Accum (	2009	1/06/2009	1
501	4	Max 09	2009	1/10/2009	2
	0				

0	Minimum ground cover
1	Post seeding
2	Maximum ground cover
3	Post harvest

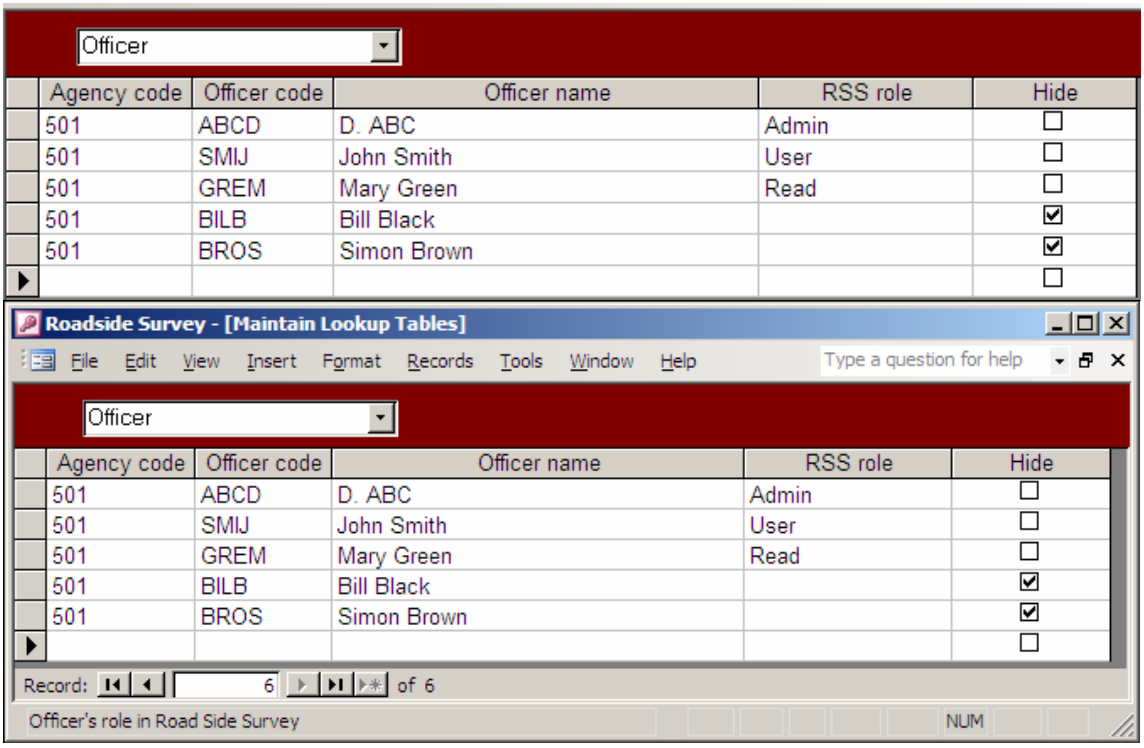
6.3.3.6 Officer

All the individuals involved with the roadside survey projects should be recorded in the officers lookup table. The officer code is used to indicate the person whom created the project, checked out a transect or who was involved in the field monitoring and observations.

- Opening the officer lookup table will initiate a popup asking the user to type in an **agency code**. This will limit the list to your particular agency. Officers from other agencies can be added to this table despite the filter. Officers working in different agencies can have the same *Officer code* but need to be assigned to each agency.



- Select your agency code from the drop down menu.
- Type in the officer code, the first 3 letters of their family name and the fist initial of their given name.
- Type in a the roadside survey role as Admin, User, Read or leave blank
- To limit the number of officers that appear in the data entry forms, tick the hide box.



Agency code	Officer code	Officer name	RSS role	Hide
501	ABCD	D. ABC	Admin	☐
501	SMIJ	John Smith	User	☐
501	GREM	Mary Green	Read	☐
501	BILB	Bill Black		☑
501	BROS	Simon Brown		☑
				☐

Agency code	Officer code	Officer name	RSS role	Hide
501	ABCD	D. ABC	Admin	☐
501	SMIJ	John Smith	User	☐
501	GREM	Mary Green	Read	☐
501	BILB	Bill Black		☑
501	BROS	Simon Brown		☑
				☐

6.3.3.7 ALUM

The Australian Land Use and Management (ALUM) classification codes are used to record the current land use. This list appears in the drop down box for ALUM in the observation data

entry form. The ALUM code has been “extended” to provide for individual crops (e.g. 3.1.1.BA = barley) to be recognised. While this is informal it is being standardised within the monitoring community.

To limit the number of options that appear in this drop down box in your data entry form, tick the box in the **Hide** column.

ALUM codes are periodically updated and fine tuned and can be added to the ALUM table. **Warning** Do not remove the old version as the observation data still refers to the ALUM code.

ALUM

Version	Code	Name	Description	Hide
7	3	PRODUCTION FROM DRYLAND AGRICULTURE		☐
7	3.1	Plantation forestry		☑
7	3.1.1	Hardwood production		☑
7	3.1.2	Softwood Softwood production		☑
7	3.1.3	Other plantation forest production		☑
7	3.1.4	Environmental forestry		☑
7	3.2	Grazing modified pastures		☐
7	3.2.1	Native/exotic pasture mosaic		☐
7	3.2.2	Woody fodder plants		☐
7	3.2.3	Pasture legumes		☐
7	3.2.3.AN	Pasture legumes, annual		☐
7	3.2.3.LU	Pasture legumes, lucerne		☐
7	3.2.3.PE	Pasture legumes, perennial		☐
7	3.2.4	Pasture legume/grass mixtures		☐
7	3.2.5	Sown grasses		☐
7	3.2.5.AN	Sown grasses, annual		☐
7	3.2.5.PE	Sown grasses, perennial		☐
7	3.2.6	Dairy Pastures		☐
7	3.2.7	Grazing on crop residue (draft)		☐
7	3.3	Cropping		☐
7	3.3.1	Cereals		☐
7	3.3.1.BA	Barley		☐
7	3.3.1.MA	Maize		☑
7	3.3.1.OA	Oats		☐
7	3.3.1.RI	Rice		☑
7	3.3.1.SG	Sorgham		☐
7	3.3.1.TR	Triticale		☐
7	3.3.1.WH	Wheat		☐

6.4 Defaults

The defaults are used to automatically populate selected fields in the tables instead of typing them each time. The default toolbar can be shown or hidden by clicking the Defaults button located on the menu bar.

The defaults are colour coded according to the table they populate. The pale yellow defaults on the left populate the *site* data, while the remaining grey defaults populate the *observation*

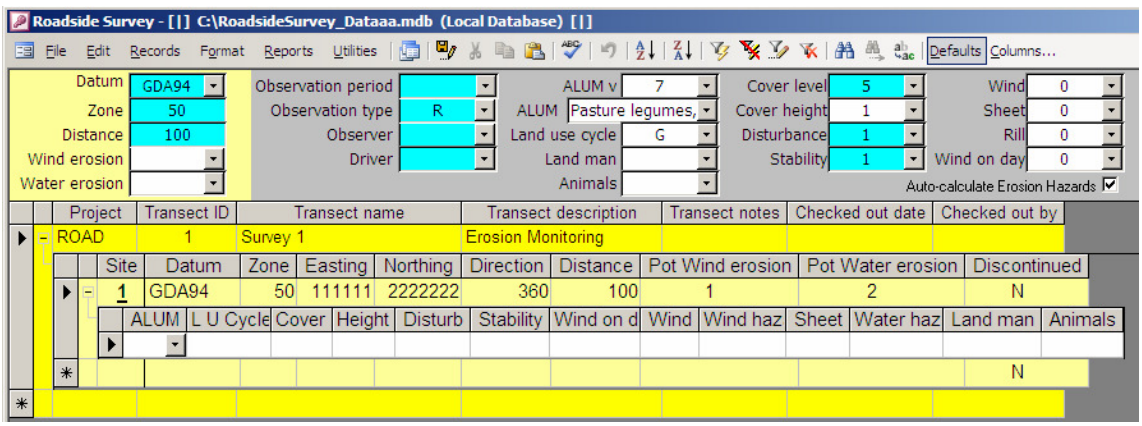
data. The defaults can be selected by typing directly into the cell or selecting from the drop down menu.

The required fields (those that need to be populated before a new observation can be saved) are highlighted in blue. They do not need to be populated in the default menu, but do need to be populated in the data entry form.

If the required field is not available (and it is not possible to type it in manually) you will need to add it to the Maintain lookup tables. The defaults values will only appear in the new *site* and *observation* cells when a character has been entered manually into one of the other cells. Descriptions of each of the fields can be found in Forward (2009) or below in section 8.

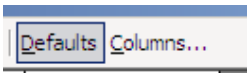
Auto-calculate Erosion Hazards

The erosion hazards for a site can be either manually entered in to the *observation* dataform or automatically calculated according to the soil **wind** or **water erosion** rating, level of **cover**, degree of **disturbance** and **stability** matrix. These combinations can be viewed in the lookup tables, Wind/ or Water Hazard Rating. Auto populated hazard ratings can be manually altered if the user does not agree with the rating.

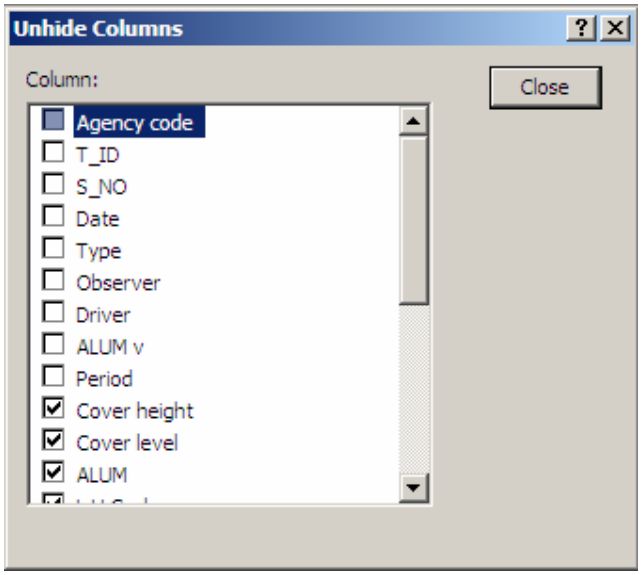


6.5 Columns

Columns can be added and removed from view by selecting the ***Column*** button on the Menu bar. It will open a window indicating the columns within the 'selected' dataform (transect, Site or observation). By selecting/unselecting the tick boxes, the number of columns shown on the dataform can be altered. In many cases the columns are automatically populated through the database form design or defaults menu, hence they are not required in the current view, i.e. Agency Code in the *Site* and *Observation* dataforms.



→



6.6 Navigating the Database

The data entry form is designed to be operated by using the keyboard instead of the mouse in most cases.

When entering data, use **Tab**, **Enter**, or **arrow keys** ←→ to move between cells within a particular dataform. When the cursor reaches the end it will move to the next dataform. Alternatively, use the **down arrow** key ↓to skip directly to the next dataform. This move coincides with a **beep** informing the user that record has been saved and has moved to the next dataform.

Many of the cells have drop down menus to validate the data to that cell. As you type, possible values are shown. When desired value appears, press tab or enter keys to accept and move to next column. The drop down menu can be opened by clicking with the mouse or pressing the F4 key when in the desired cell.

Use the scroll bar, arrow key or button located at the bottom of the database window to move to the last record. The button will take you to the next new record.

7 Before Commencing

Before initiating the monitoring of erosion through roadside surveys, several steps have to be taken:

1. connect to the Master Backend and update the lookup tables with the relevant data

2. if the desired transect has not been created than this will have to be done

3. “check out” the chosen transects to the monitoring staff

The survey staff can now create new sites if required, or start monitoring for erosion

7.1 Create Transect

Transects are an abstract data collection object. Transects group sites in convenient bite size groups for data capture and maintenance and have no ‘real’ use in the database, apart from the naming of a site. Ideally, transects should not cross agricultural time districts (growing seasons) which may result in a transect being completed in two or more sections. For statistical analysis, the various mapping units (political or geographic physical?) should be used.

Transects need to be created in the Master before any new observation data can be uploaded to the Master. This must be done by the administrator.

1. Switch to the Master

In the first dataform, coloured yellow, enter the following:

2. select the ***Project*** name. (**Agency** is automatically populated)

Agency code	Project	Transect ID	Transect name	Transect description	Transect notes	Checked out date	Checked out by
501	ROAD	1	Survey 1	Erosion Monitoring			
	AAS	Atlas of Australian soils			Department of Agriculture and Food, Western Australia		
	NCA	North and Central Aust.			CSIRO Soils (NT)		
	NP	Nullabor Plain			CSIRO Soils (SA)		
	ROAD	WA Roadside Survey for Wind and Water Erosion Monitoring			Department of Agriculture and Food, Western Australia		
	WB	Wheat experiments in Western Australia - 1967,1968 & 1970			CSIRO Soils (WA)		

If the Project name is not available it will need to be added to the Project table under Maintain Lookup Tables (Utilities | Lookup Tables). Note, Agency Number, will also be required to create a new project (Agency table is under Maintain Lookup Tables).

3. fill in the ***Transect ID*** (number), the ***Transect Name***, ***Transect Description*** and other notes.

Note:

The transect ID has to be unique within the agency. The Project is an additional description used in reporting.

7.2 *"Checking out" a Transect*

While it is desirable to have a single copy of the data maintained by all (authorised) users, the majority of data is entered in the field into local copies. Thus, there is a risk of concurrent editing in different Backends. "Checking out" is a property implemented in the Master at the transect level. When implemented, it means that the data within that transect can not be edited in the Master Backend. The transect was chosen in part because it is a convenient package to transferred back to the Master.

To check out the transect the ***Checked out date*** and ***Checked out* by** fields need to be populated in the Master Backend. (issue with only putting in a date, can not edit master once checked out.

		Project	Transect ID	Transect name	Transect description	Transect notes	Checked out date	Checked out by
▶	+	ROAD	1	Survey 1	Erosion Monitoring		21/03/10	ABCD
*								

7.3 *Downloading Data*

For simplicity, copying the RoadsideSurvey_Dat.mdb is used as the strategy to download data. Thus, use Windows Explorer to make a copy of the Master Backend and rename it to either RoadsideSurvey_Dat.mdb or another convenient file name, such as the transect name.

As it may be appropriate to limit what is provided to a colleague, the Frontend may be used to connect to the new Backend (Utilities | Data File | Change DataFile…) and delete the transects that will not be monitored (Utilities | Delete Transect).
Send the new Backend to relevant users.

****Warning**** DO NOT use an 'old' copy of the Backend to enter new data, as the process of uploading new data involves deleting the entire transect from the database and replacing it with all the data in the checked out version.

8 In the Field

Before recording the site and observation data, some of the clutter should be removed from the screen. The transect form can be limited to show only the chosen transect by clicking on the desired transect name and then press the ***Filter By Selection*** button. To remove the filter, select the button.

The next option is hide columns by using the columns button. Columns… and deselecting unwanted columns.

8.1 *Order of Sites in a Transect*

The site identifier is used to order the sites along a transect. This identifier is a decimal number allowing for sites to be inserted between existing sites (see below).

8.1.1 Hiding Sites

The principle invoked is that a site once observed can not be removed. However, for several reasons it might be desirable to discontinue the observations at a particular site. In the *Site* Data entry form, select '**Y**' under *Discontinued* to colour the cell red and notify users that a site is no longer monitored. To remove these sites from view, place the cursor in this cell and press the filter Excluding Button, . To remove the filter, select the button

8.1.2 Transect in reverse

To conduct a transect in reverse, place the cursor in the Site Number field and select the button to sort the sites in descending order. Select to sort in ascending order.

8.2 Sites

8.2.1 Create New sites

Click on the + symbol to the left of the project to open site details.

Several fields are compulsory and need to be filled in. Some of these can be populated by filling in the yellow section of the ***Default*** menu. After all the required fields are populated manually or through the defaults, move through the cells to the end using either the tab or site arrow key, or press the down arrow to move to the next data form. This action will save the data into the database.
New sites will occasionally need to be created.

8.2.1.1 New or Extend Transect

New sites can be added to the end of an existing transect by going to the last record/ new record of the site dataform and creating a new site record. The site number will be automatically generated.

Use the scroll bar, arrow key or button located at the bottom of the screen to move to the next new record.

8.2.1.2 Insert sites in-between current sites

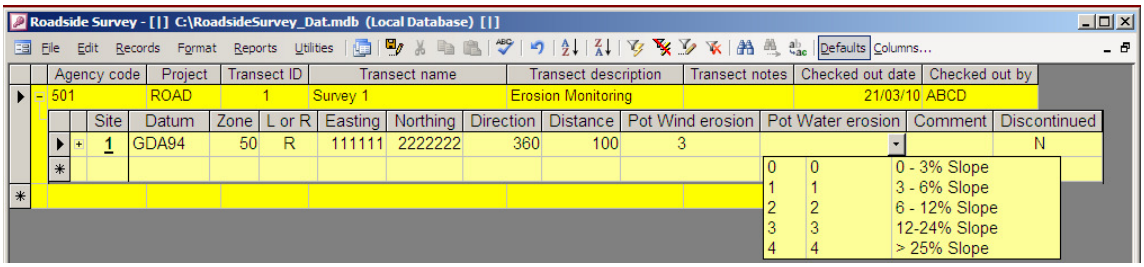
The database has been designed to recognise decimal numbers. For example, if a site is to be added between 5 and 6, then 5.5 can be used. After closing and reopening the database, site 5.5 will appear in-between sites 5 and 6.

To insert a new site move to the next new record in the site dataform and **manually** type the chosen site number. Enter the remaining site and observation data as normal.

Use the scroll bar, arrow key or button located at the bottom of the screen to move to the next new record.

8.2.2 Site details

The site data is simply entered by typing in a cell or selecting from the drop down menus (F4).. Below is a list of the fields in the site data form. More detailed descriptions of each of the fields can be found in Roadside Survey Manual (Forward 2009).



8.2.2.1 Available site fields

Required fields can be populated manually, using a drop down menu or automatically according to the defaults:

Site	Site number is automatically filled in numerical sequence, or manually populated
Datum	Datum of the site
Zone	Required
Easting	Required (enter 111111 if coordinates captured initially as waypoints)
Northing	Required (enter 1111111 if coordinates captured initially as waypoints)
Direction	Direction to the centre of the field site as a bearing (0° – 360°).
Distance	Distance to centre of site in field. Must be greater than 50m as site is 100m wide
Left or Right	Direction of the site from the vehicle, according to the intended direction of travel
Wind Eros	Wind erosion potential rating based on soil type and position in landscape
Water Eros	Water erosion potential rating based on slope
Comments	Other comments
Discontinued	Discontinue site observations

8.2.2.2 Auto populated site fields

Agency and T_ID (Transect) are populated automatically according to the data in the parent form. The GDA94 coordinates are calculated when moving to the next record. The automatically populated fields are:

- *Agency*
- *T_ID*
- *East GDA (of the vehicle)*
- *North GDA*
- *Lat GDA*
- *Long GDA*
- *Site East GDA (of the observed site)*
- *Site North GDA*
- *Site Lat GDA*
- *Site Long GDA*

Need to include a definition of Topo Ratings (wind erosion potential etc aquire

8.2.2.3 Recalculating coordinates

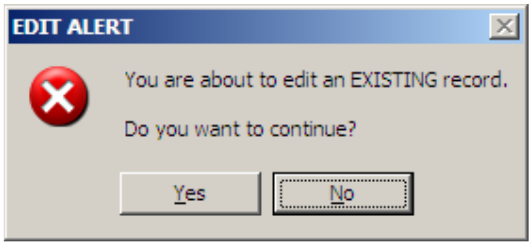
The coordinates recorded is the car's position on the road position. The location of the paddock site are calculated automatically when the values are entered into the database.

However, there will be cases such as when coordinates are captured in a waypoints file and added to the database through a query etc. In these situations the coordinates will need to be recalculated.
Recalculate coordinates by selecting the Calculate GDA Coordinates from the Menu items (Utilities | Calculate GDA Coordinates)

8.2.3 Edit Existing Sites

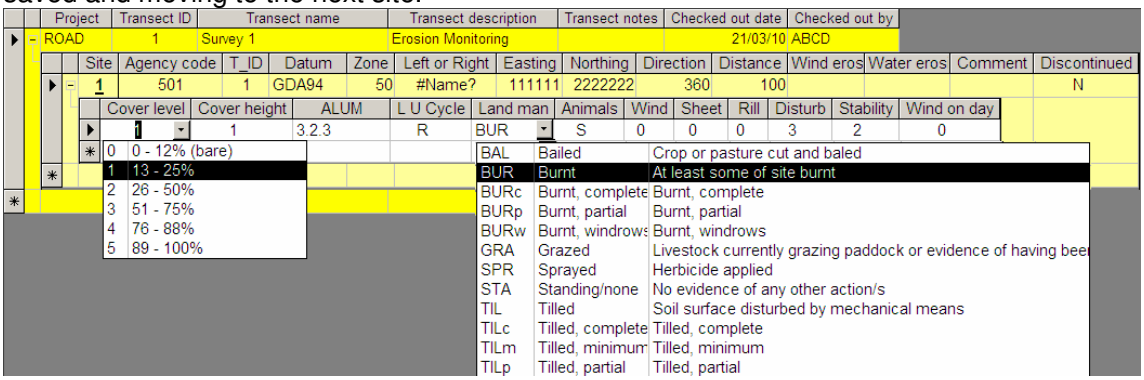
When observing a transect on subsequent occasions there is no need to edit the *Site* information. Place the cursor in the observation dataform and insert the data for the latest observation. When finished entering the data the cursor will jump to the first cell of the observation data for the next site.

However, saved data can be edited at any time. Select the desired piece of data that needs to be edited and change to the appropriate value. A warning message will appear to inform the user that they are about to edit an existing record. This will ensure that the user has deliberately changed the value and has not accidentally selected the wrong cell.



8.3 Enter Observation Data at a Site

Upon entering the *site* data, the cursor will automatically move to the first cell of the next data form, the *observation* data. Several fields are required before the observation data can be saved and moving to the next site.



Upon entering the observation data for the site, the cursor will either move to the next observation of the next existing site or new site.

8.3.1 Available Observation Fields

Required fields can be populated manually, using a drop down menu or automatically according to the grey section of the ***Default*** menu. Refer to the field manual for details on the observation fields.

Observation Field	Description
Observer	The individual writing down the observations. Individual must be registered to the same agency as the current agency.
Driver	The individual driving the vehicle. Individual must be registered to the same agency as the current agency.
ALUM v	The ALUM version
ALUM	The ALUM Code. (The number of ALUM codes displayed in the dropdown Menu can be adjusted in the ALUM lookup table.)
Period	Observation Period
Cover Height	The height of the vegetation in the paddock
Cover Level	The cover class of the vegetation is providing
L U Cycle	Land Use Cycle
Land Man	Land Management phase
Animals	Type of Livestock present in the field
Wind	Evidence of wind erosion
Sheet	Evidence of sheet erosion
Rill	Evidence of sheet erosion
Disturb	Disturbance of the topsoil
Stability	Is the soil stable regardless of other factors?
Wind on day	Wind erosion occurring on the day of observation
Comments	Other comments
Wind Hazard	The wind erosion hazard rating, automatic or manual selection
Water Hazard	The water erosion hazard rating, automatic or manual selection

8.3.2 Auto populated observation fields

Agency, T_ID (transect) and S_NO (site number) are populated automatically according to the data in the parent table. These are the automatically populated fields:

- *Agency*
- *T_ID (Transect)*
- *S_NO (Site number)*

- *Date*

9 Data Validation

Data validation should be conducted before any new data is loaded into the Master database. There are currently no queries developed to determine if there are any errors in the data. However, it is recommended to do the following before the data is uploaded:

1. connect to the 'checked out' version of the database by selecting *Change Data File* tab in the menu items (Utilities | Data File | Change DataFile…)

2. open the Charting Menu Tool used for reporting (Reports | Charts) section 9 Reporting. Aggregate by Transect to determine if there is an unusually large number of sites in a particular Hazard category.

3. view the data as raw data either through the forms, or directly in the access tables.

10 Upload data to Master

Once the new monitoring data for a transect has been collected it needs to be uploaded to the Master allowing everyone access to the data. The process of uploading involves deleting all the site and observation data relating to the chosen transect in the Master Backend, and replacing it with the latest observation data in the '*checked out*' local Backend. A backup copy of the database is made before this occurs.

If you have administrator rights:

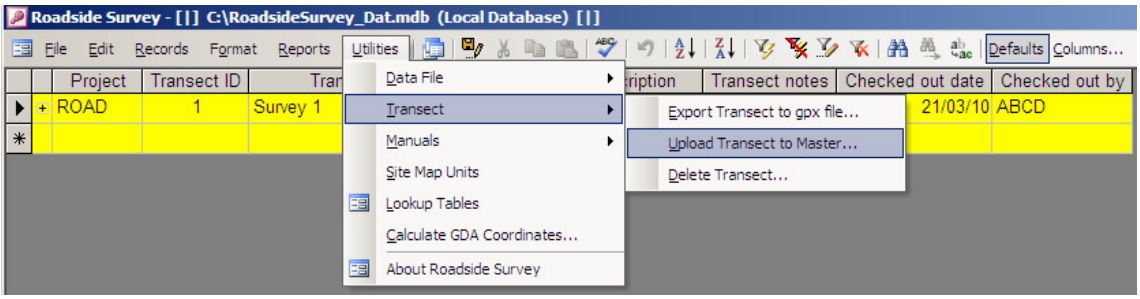
1. open the local checked out version of the Backend (Utilities | Datafile | Change Data File)

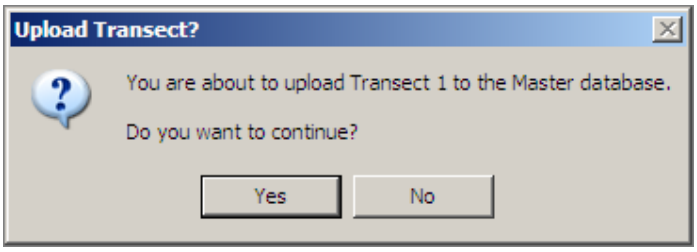
2. make sure that the Frontend will connect to the correct Master Backend (Utilities | Lookup Tables → DataFile). The process of uploading to the Master relies on the pathway that is specified in the DataFile

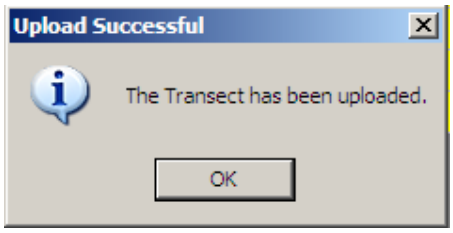
3. ensure that the version about to be loaded into the database has all the information that is currently on the Master database.

4. Select the *checked out* transect that needs to be uploaded to the database. Then select (Utilities | Transect | Upload Transect to Master…) to upload the data to the Master. (If the *Checked out date* and the *Check out by* information is not the same in both datafiles it will not update the Master.) A message will appear informing the user he is about to upload the data to the Master Backend.

In the event that the Master Backend can not be found a window will appear asking for the location of the Master Backend. Another Message will appear to inform the user of a successful upload to the Master.



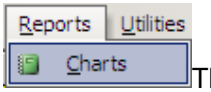




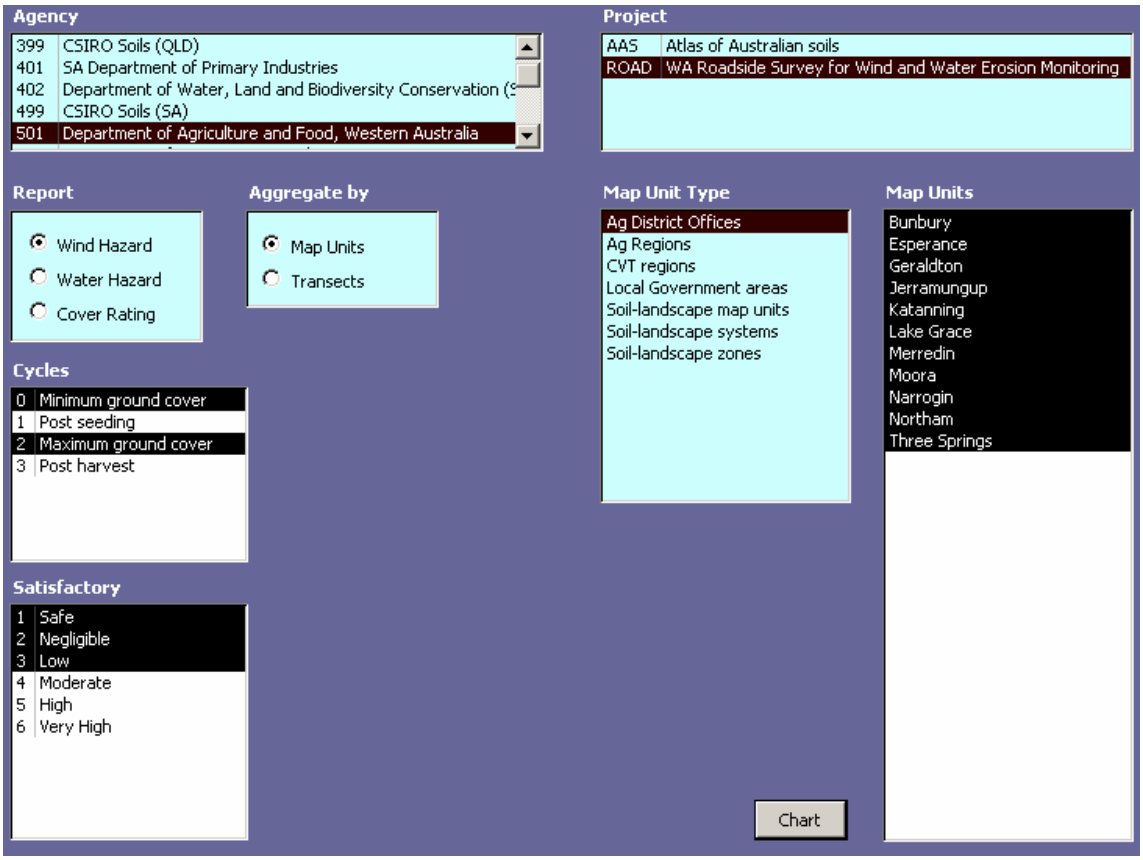
11 Reporting

Reporting is one of the most important parts of the monitoring process. The current output is limited to one type of graphic output, a stacked area chart. It is available for the **cover level**, **wind hazard** and **water hazard** by the desired **transect** or **mapping unit**. The *Map Unit Type* and *Map Units* are required for each site before a legitimate graphic output is produced. (Refer to section 10 Loading Map Units for more information regarding loading map units.)

Select the charts button under the reports menu button (Reports | Charts).



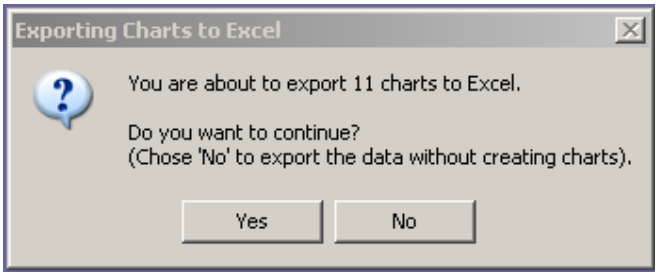
This will open up the Charting Menu Tool.



Select the relevant fields.

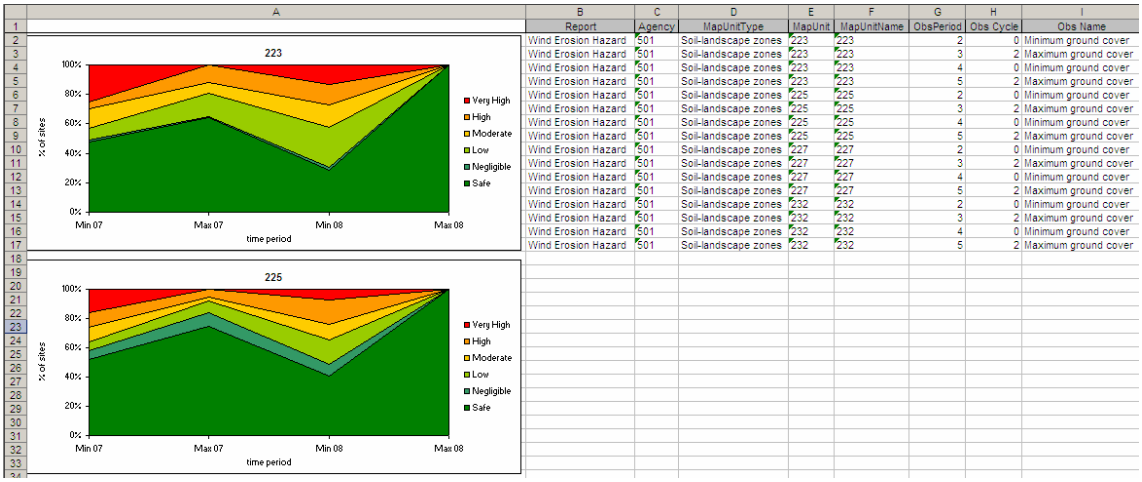
Agency	The Agency
Project	The Project
Report	Wind Hazard Water Hazard Cover Rating
Aggregated by	Map Unit Transect
Map Unit Type	The type of map unit i.e. soil type, government boundaries etc.
Map Units	The map units to be displayed. All map units are selects as a default. Click on a map unit to select an individual map unit. To select more than one map unit hold the shift or control key.
Cycle	The cycles to be shown on the graph
Satisfactory	Which Hazard or Cover ratings are classified as satisfactory, or acceptable. The data output provides the percent of sites which are classified as satisfactory/ acceptable. The data can be used to generate a customised graph.

Once the parameters have been selected, press the **Chart** button. A pop up box will appear informing the user of the number of graphs that will be produced.
Select '**No**' to export the data only.



The excel file created will open and will have Graphs down the left, and the data to the right. Each Graph uses the ***MapUnitName*** as the title for each individual graph. Individual graphs can be edited as would normally be done in Excel.

****Warning**** This is an unsaved file. If you want to keep it, press save and you will be prompted for a file name and location.



	B	C	D	E	F	G	H	I
1	Report	Agency	MapUnitType	MapUnit	MapUnitName	ObsPeriod	Obs Cycle	Obs Name
2	Wind Erosion Hazard	501	Soil-landscape zones	223	223	2	0	Minimum ground cover
3	Wind Erosion Hazard	501	Soil-landscape zones	223	223	3	2	Maximum ground cover
4	Wind Erosion Hazard	501	Soil-landscape zones	223	223	4	0	Minimum ground cover
5	Wind Erosion Hazard	501	Soil-landscape zones	223	223	5	2	Maximum ground cover
6	Wind Erosion Hazard	501	Soil-landscape zones	225	225	2	0	Minimum ground cover
7	Wind Erosion Hazard	501	Soil-landscape zones	225	225	3	2	Maximum ground cover
8	Wind Erosion Hazard	501	Soil-landscape zones	225	225	4	0	Minimum ground cover
9	Wind Erosion Hazard	501	Soil-landscape zones	225	225	5	2	Maximum ground cover
10	Wind Erosion Hazard	501	Soil-landscape zones	227	227	2	0	Minimum ground cover
11	Wind Erosion Hazard	501	Soil-landscape zones	227	227	3	2	Maximum ground cover
12	Wind Erosion Hazard	501	Soil-landscape zones	227	227	4	0	Minimum ground cover
13	Wind Erosion Hazard	501	Soil-landscape zones	227	227	5	2	Maximum ground cover
14	Wind Erosion Hazard	501	Soil-landscape zones	232	232	2	0	Minimum ground cover
15	Wind Erosion Hazard	501	Soil-landscape zones	232	232	3	2	Maximum ground cover
16	Wind Erosion Hazard	501	Soil-landscape zones	232	232	4	0	Minimum ground cover
17	Wind Erosion Hazard	501	Soil-landscape zones	232	232	5	2	Maximum ground cover

The data to the right of the graphs consists of:

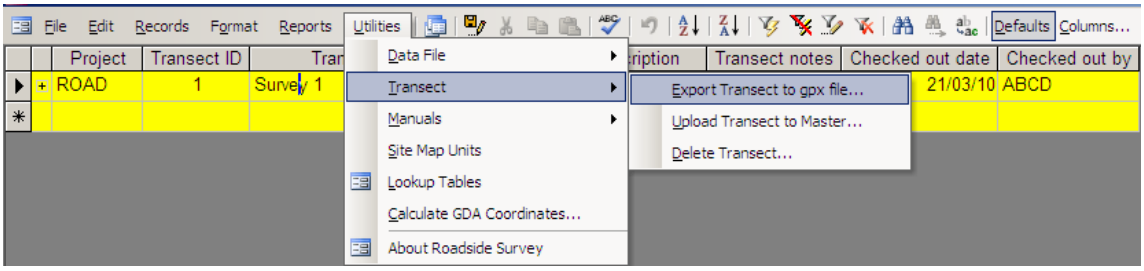
Heading	Definition
Report	The report Type
Agency	The agency that has been specified
MapUnitType	The type of Map Unit selected for aggregation
Map Unit	The Map Units selected for graphic reports
MapUnitName	The Map Unit Name which is used to produce the titile for each graph. Note; the link between the data and the title is not real, you can not change the data and cause a change in the title name.
ObsPeriod	The period in which the observation was taken
Obs Cycle	The cycle when the observation was taken
Obs Name	The detail name of the Observation cycle
Obs Label	The label used in the graphic output
Numbers 1 - 10	1 = Safe Hazard / 88 -100% Cover 2 = Negligible Hazard / 75 - 87% Cover 3 = Low Hazard / 51 - 74% Cover 4 = Moderate Hazard / 26 - 50% Cover 5 = High Hazard / 13-25% Cover 6 = Very High Hazard / 0 - 12% Cover 7-10 = Extra columns for future use
Total	Total number of Sites for the map unit
Area	Area of the Map Unit
Satisfactory	Percent of sites considered satisfactory an aggregation of the values for the values highlighted in the form.

12 Exporting GPS information

The GPS information for each site can be exported and used for spatial intersections to produce **mapping units** used in reporting, and also to be loaded into a GPS which will enable a driver to relocate a designated site.

12.1 Exporting coordinates for GPS

Select the transect to be exported by placing the cursor in the appropriate row. Select the Export Transect to gpx file… (Utilities | Transect | Export Transect to gpx file…)

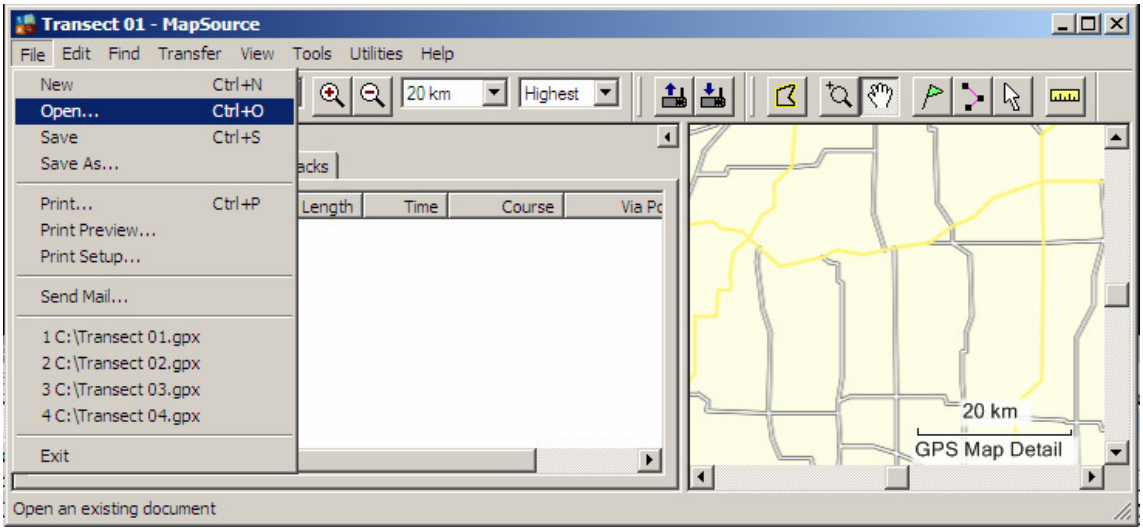


A message box will appear informing the user that they are about to export a gpx file, its location and the name of the file.

This file can then be loaded onto a GPS using the appropriate methods.

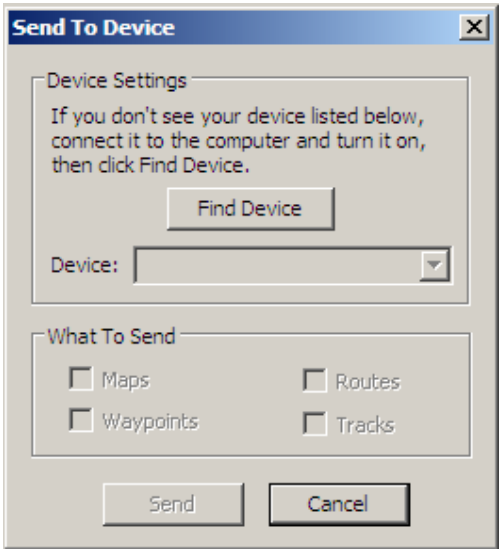
12.1.1 Garmin

Open the MapSource program. Open the waypoint file to be loaded onto the GPS.



Connect the GPS to the computer.

To transfer the coordinates to the GPS, press the button. Click the *Find Device* in the following window to find the GPS. Click *Send* to transfer the data to the GPS.



12.2 Exporting coordinates for mapping

This feature will be added shortly

13 Loading Mapping units

This feature will be added shortly.

14 Administrative Duties

The administrator(s) maintain the database to ensure data integrity and consistency. Their duties are:

1. install and distribute copies of the database
2. distribute new versions of the Frontend and Backend when they are available
3. update manuals
4. update the lookup tables to include the latest information, in particular, survey period
5. maintain the assignment of map units to sites through GIS spatial intersections
6. create new transects in the Master Backend
7. checkout transects to monitoring staff
8. check data for inconsistencies
9. upload checked out transect data into the Master Database
10. remove backup copies of Master Backend when they are no longer required
11. regularly compact and repair of database.

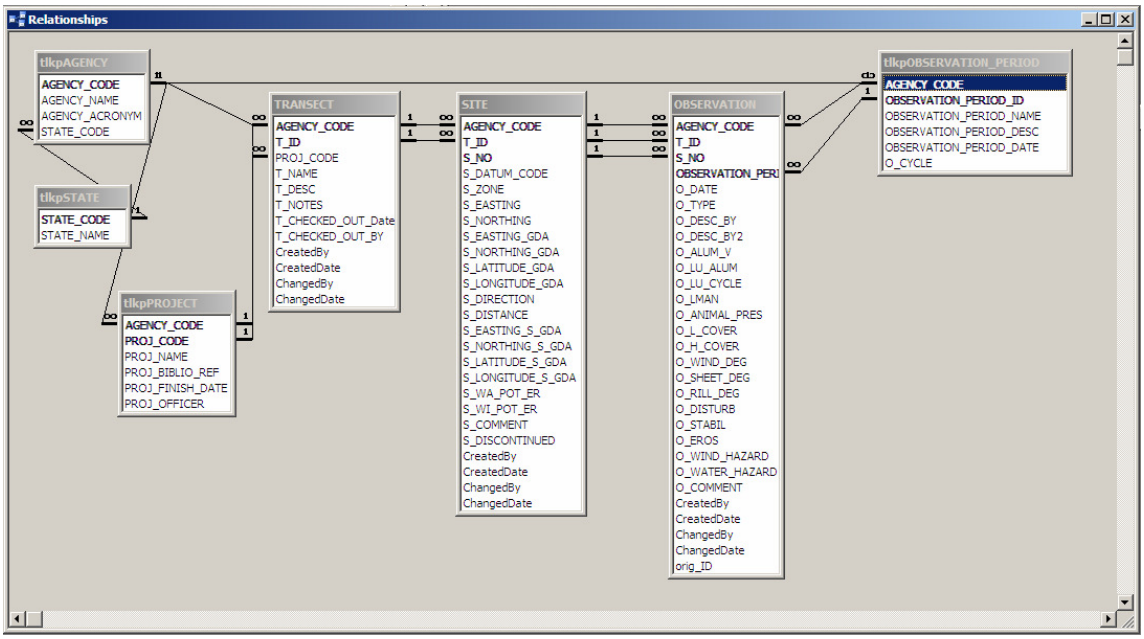
15 Advanced information

15.1 Database Versions

The version number is shown on Startup and by selecting Utilities, About RoadSideSurvey

15.2 Database structure

The Roadside Survey Database is based on a hierarchal design of agency by transect by site by observations over time. The image below is a simplified version of the actual data structure. The true structure can be found within the database.



Each table contains a primary key which then create a unique combination for each observation This is done by combining agency by transect by site by observation period.

15.3 Linked Tables

The data is stored in the Backend and is liked to the front end and displayed through forms. Please do not link additional tables from other databases into the Frontend as it creates problems with the re-linking functions built-in to the database design. If additional tables need to be linked to the Roadside survey tables do so in another database