ReefMaster Reference

2013-04-12 V1.1.4.51

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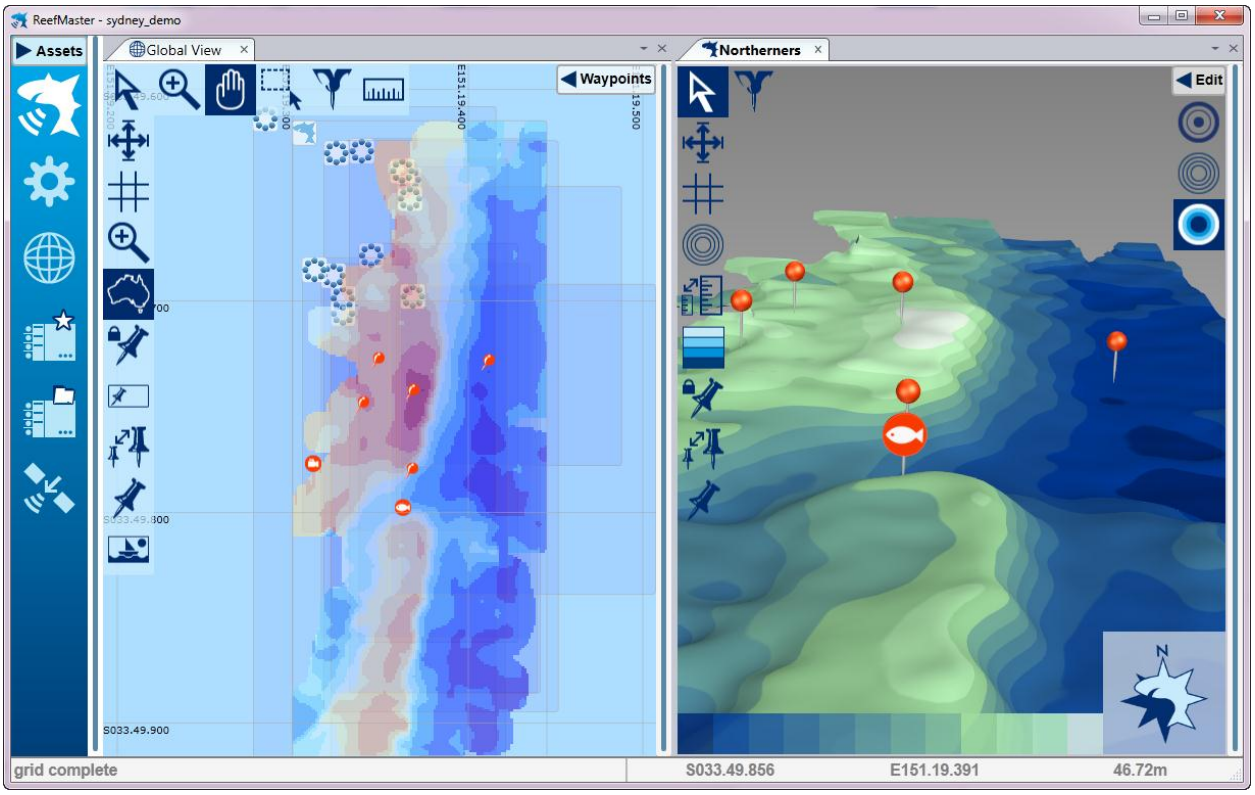
What is ReefMaster?

Mapping and Fishing Focused Waypoint Management Software for the PC

The ReefMaster Application



ReefMaster is a Windows PC application that combines easy-to-use underwater mapping and graphical waypoint management, with the emphasis on features that are useful to anglers.

Underwater Mapping

ReefMaster generates underwater maps using track log data collected on a GPS/depth sounder combination unit. Once a map has been created, depth contour lines can be exported back to compatible GPS devices where they can be viewed whilst afloat.

ReefMaster uses the data in the individual track-log track-points, which each contain the boat's position and depth, to create a 3D model of the sea or lake bed underneath the boat. Detailed models can be built up with just a few hours of data, which can be gathered whilst fishing. Over time, models increase in size and detail as further tracks are added. There is no limit to the number of tracks that can be combined into a single model, other than the resources of the computer system that is running ReefMaster.

Waypoint Management

ReefMaster offers comprehensive, easy to use, graphical waypoint management including drag and drop of waypoints in both 2D and 3D.

Waypoints can be created either on a GPS unit or within the ReefMaster application. Within the ReefMaster application, waypoints can be edited, have images and notes assigned to them, and be freely copied and moved to different waypoint sets. Updated waypoints can then be selected for export to a GPS unit.

Basic Concepts

Assets and Asset Types

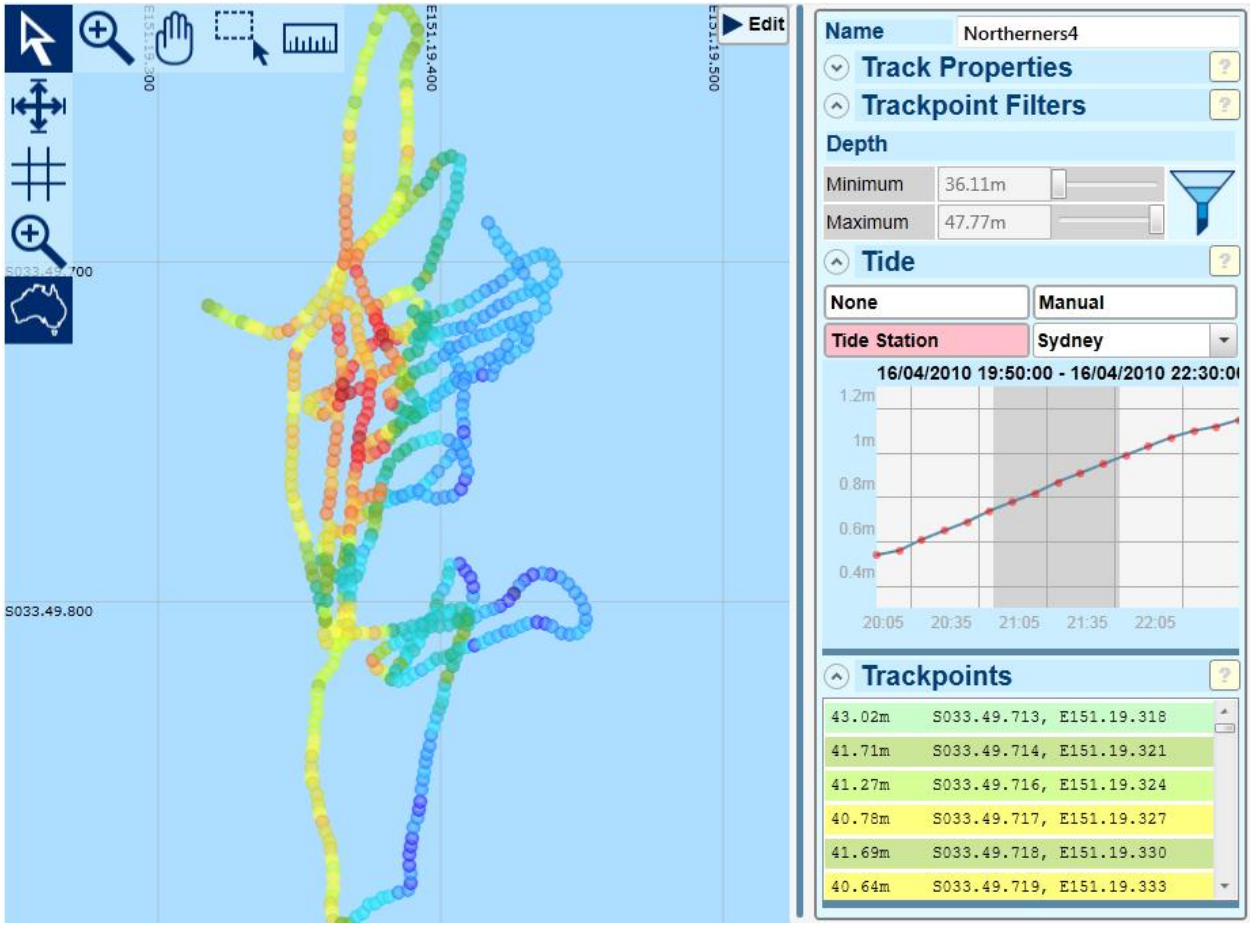
A quick introduction to the types of data supported by ReefMaster.

Assets

Individual data items, such as track logs, waypoint sets or map projects, are referred to in ReefMaster as *assets*.

ReefMaster supports a range of different asset types, each of which is shown and briefly described in the list below.

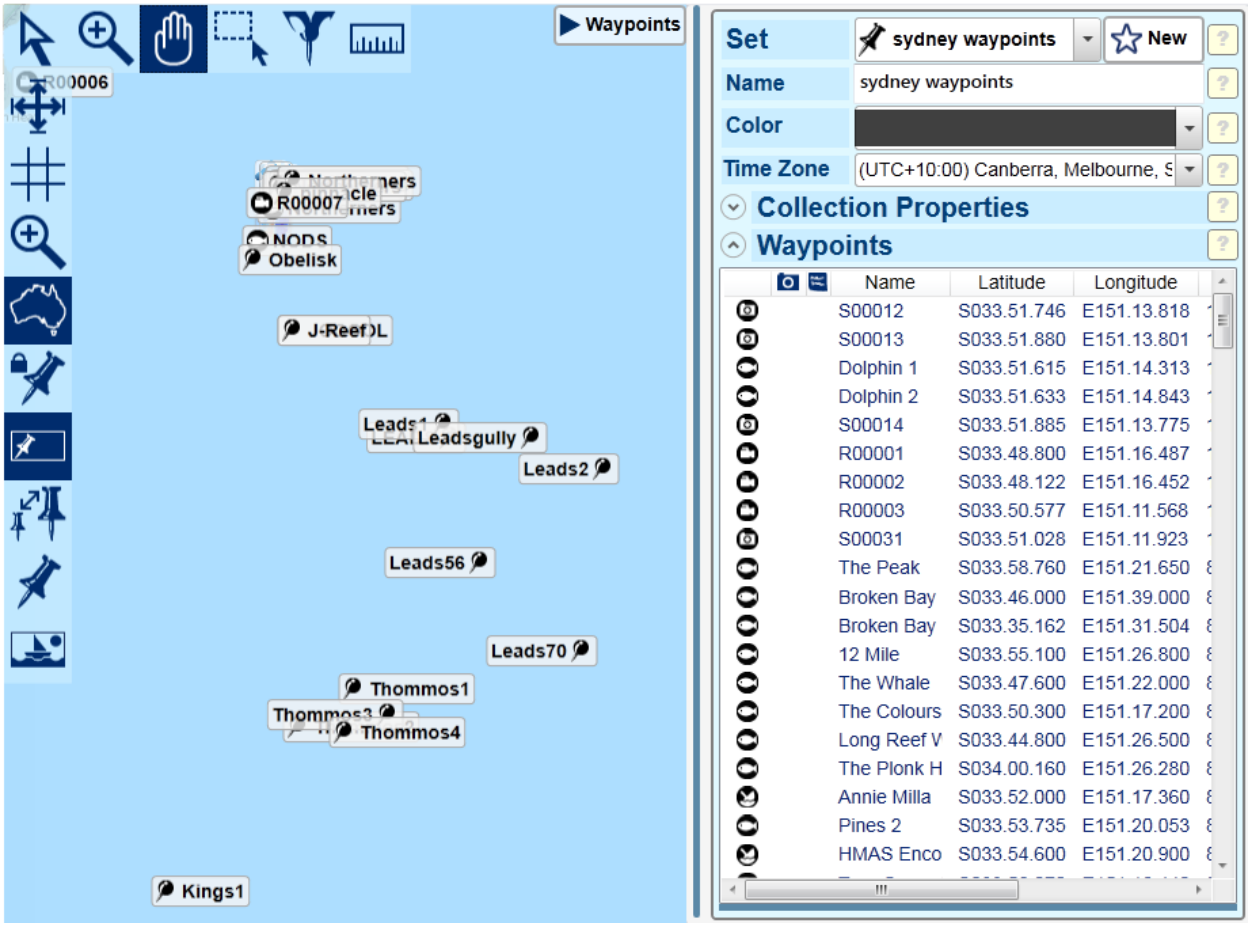
Track



Track logs imported from a GPS device are known as *Tracks*.

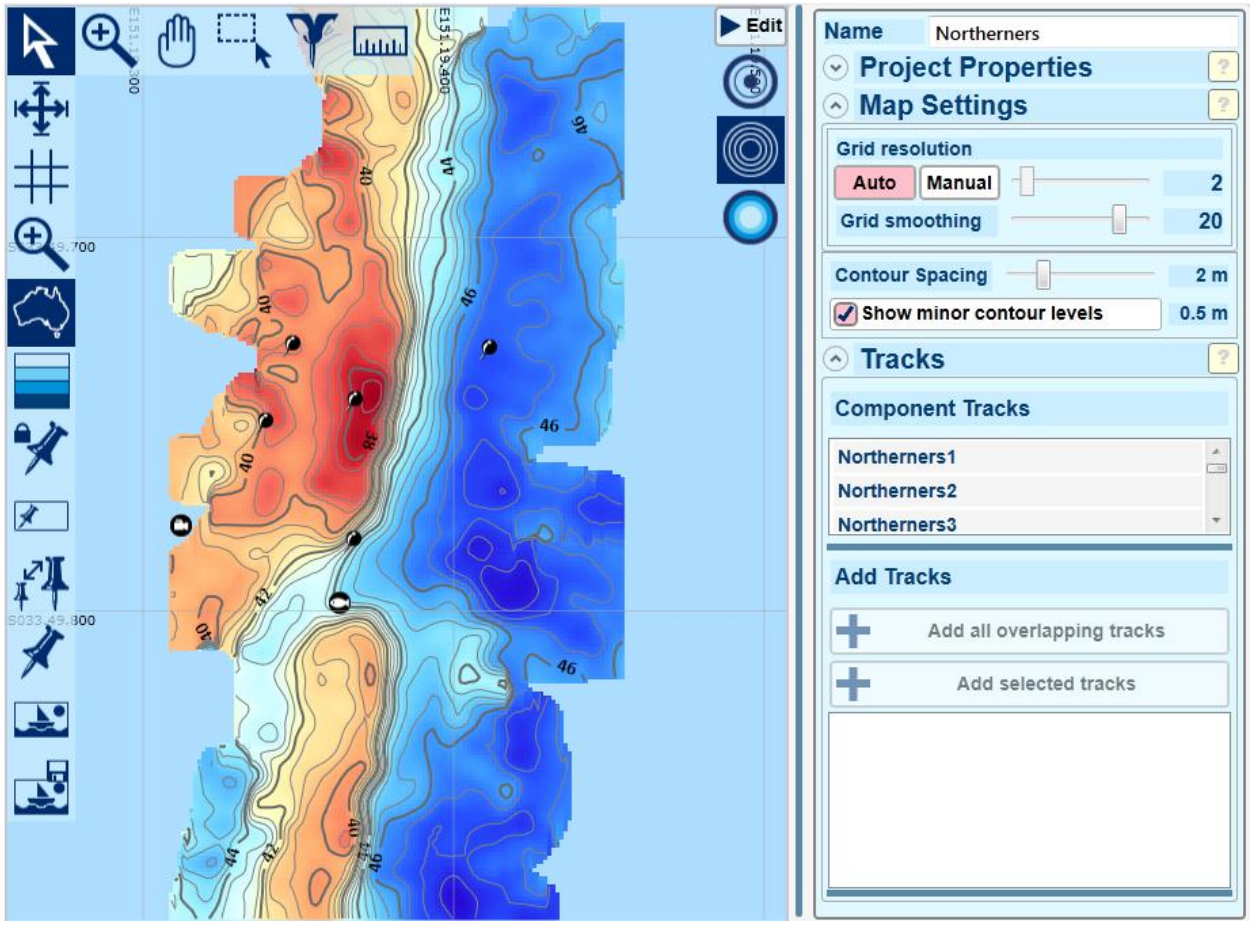
Tracks are made up of a number of individual track points which contain location and depth information. Depth and location data from track points is used to generate underwater maps.

Waypoint Set



A *Waypoint Set* is the term used to refer to a group of waypoints. There can be any number of separate waypoint sets within a workspace. Individual waypoints can be freely moved or copied between different sets.

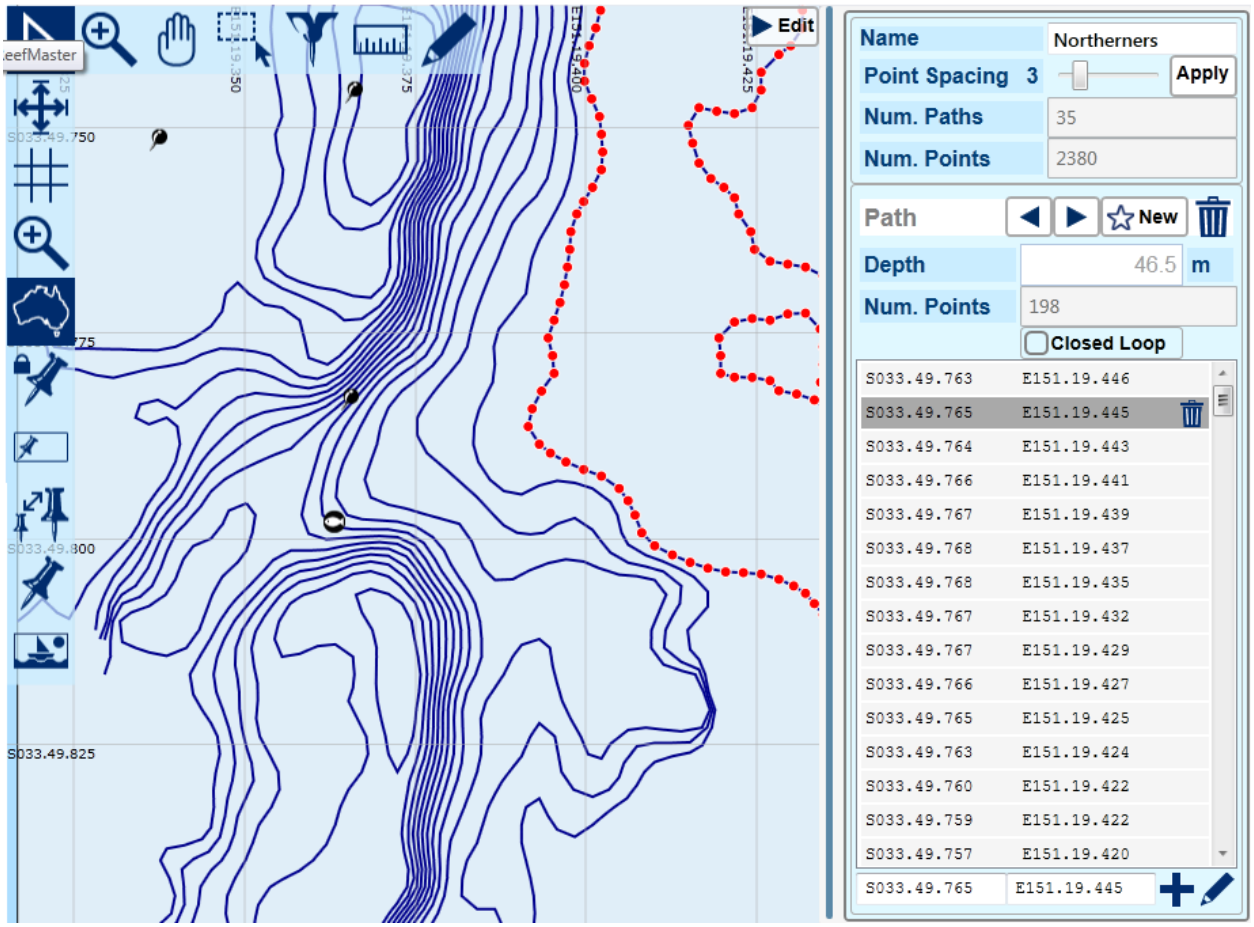
Project



A *Project* is an underwater map project created by the ReefMaster application. Maps are made using data from *track points* contained within tracks that have been imported from a GPS device. To create a map, one or more tracks are added to a project, and a map area is defined.

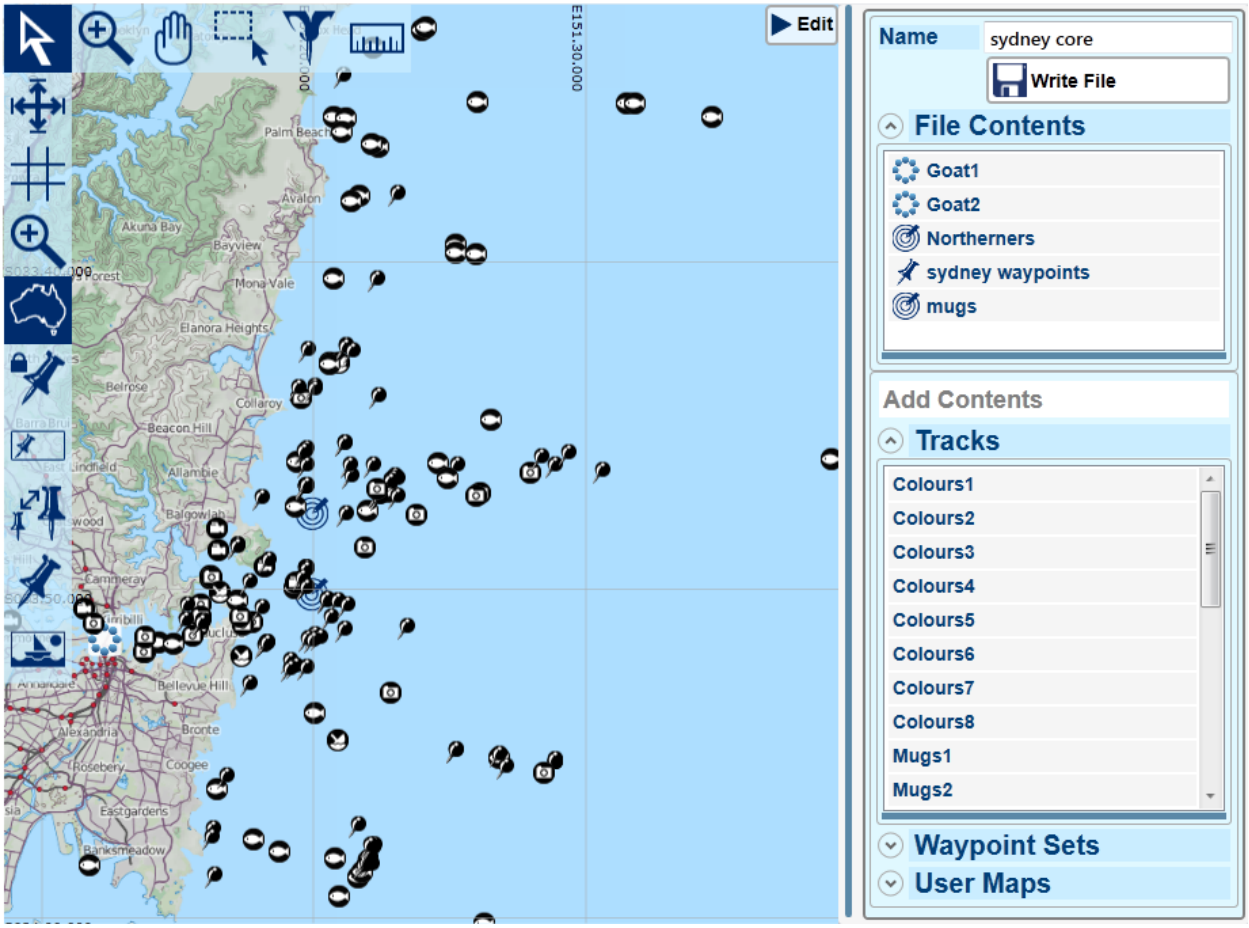
A project can be made up of any number of separate tracks. Maps can be viewed in 3D or 2D. A 2D map is shown as a collection of depth contour lines, which may be exported as an image or, via a *User Map*, to a compatible GPS device.

User Map



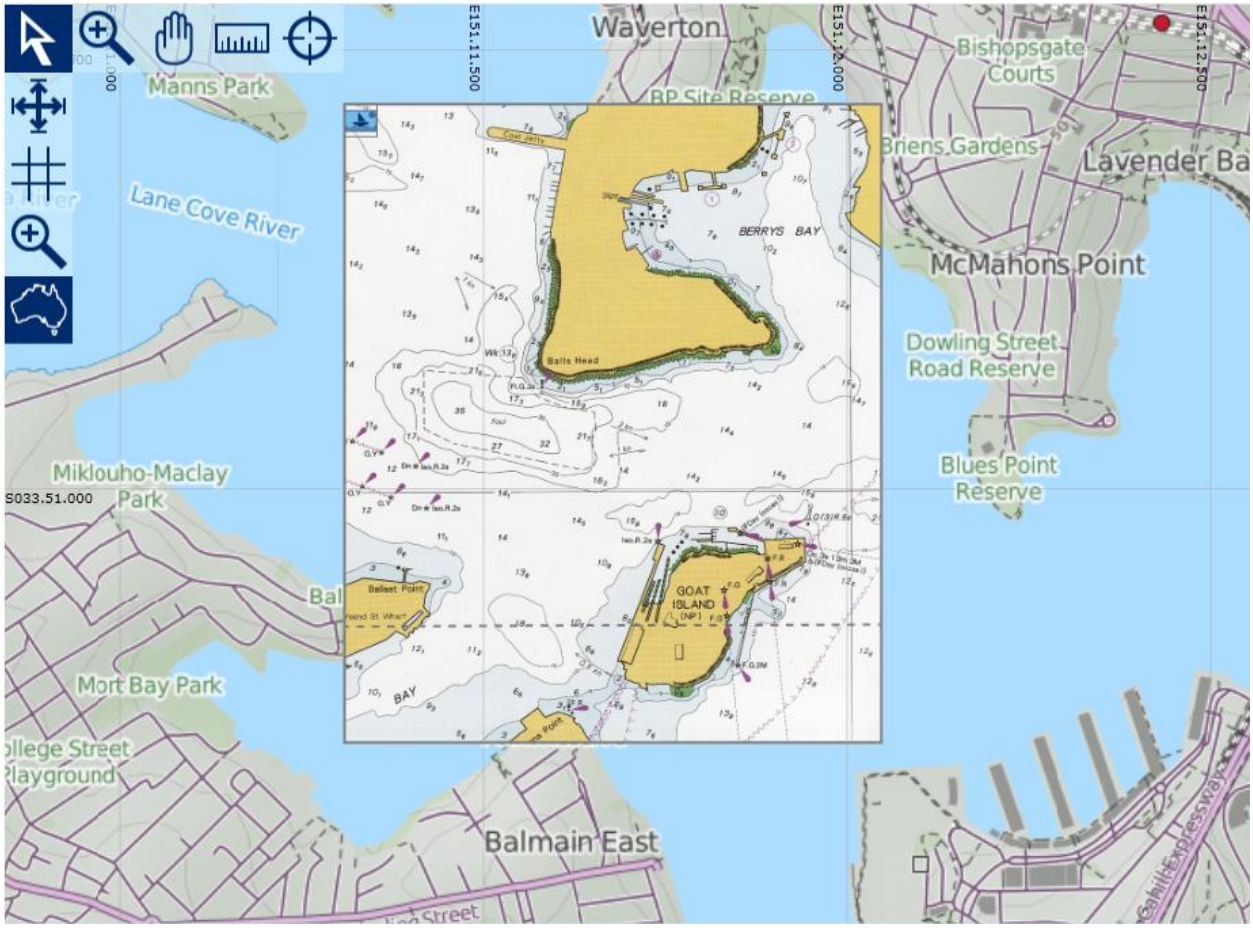
A *User Map* is a map created within ReefMaster specifically for export to a GPS device. A user map is a collection of lines, known as *Paths* which can be exported to a GPS device as contour or boundary map lines, or as segmented track logs. Paths within a user map can be sourced from contour lines generated in *Projects*, or created manually; for example, to outline a marine sanctuary zone so that the zone boundaries can be seen on a GPS device.

Data Set



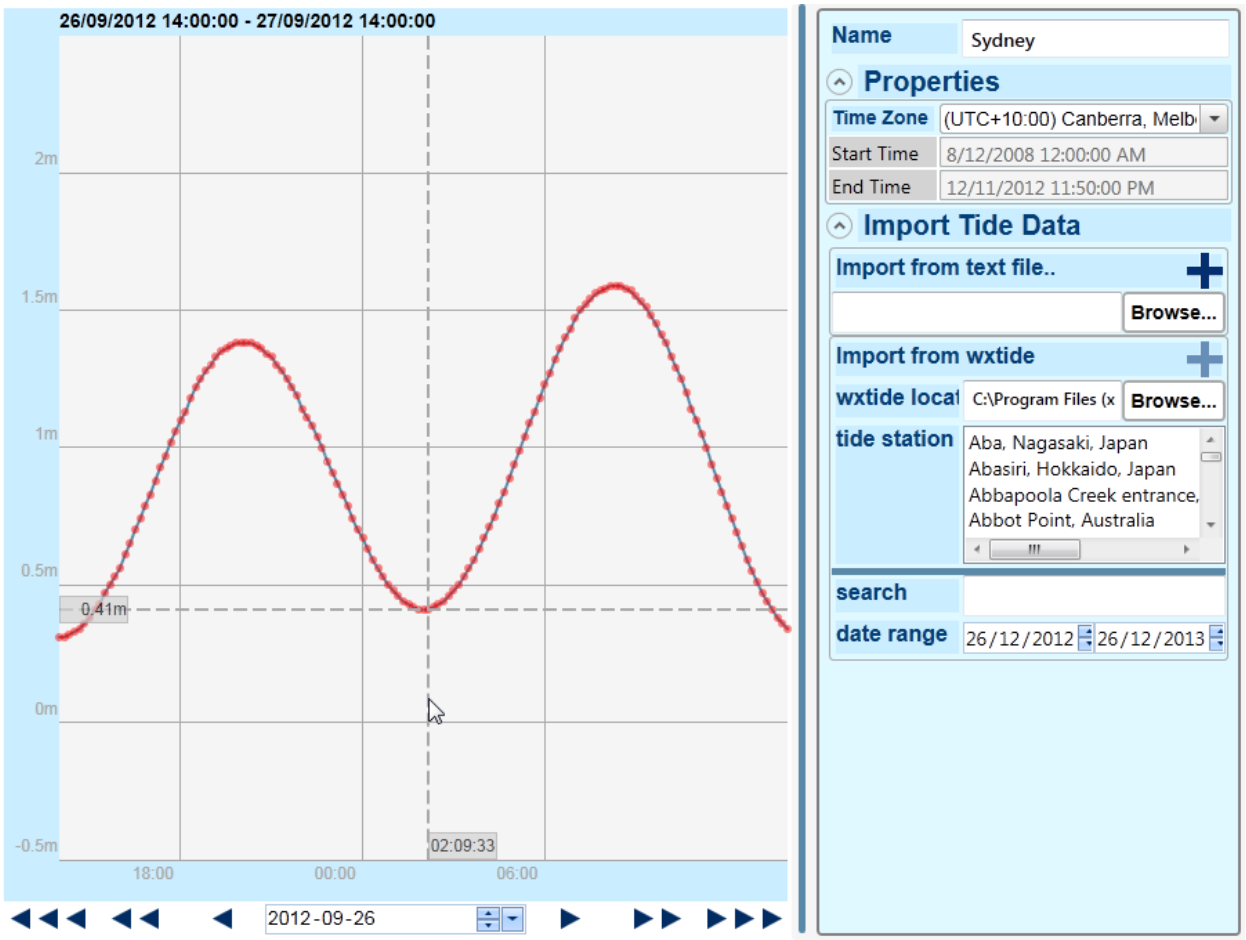
A *Data Set* is a collection of assets grouped for export to a GPS device. Data sets can contain *Waypoint Sets, Tracks* and *User Maps*. Grouping assets into a data set makes it easy to maintain different sets of data for export; for example, you might create a data set for each different port that you fish out of, containing just the waypoints and maps needed for fishing in that location.

Background Image



Background Images can be imported and calibrated for use as a background within edit windows. For example, a high resolution satellite image could be imported for use as a background to a map project.

Tide Station

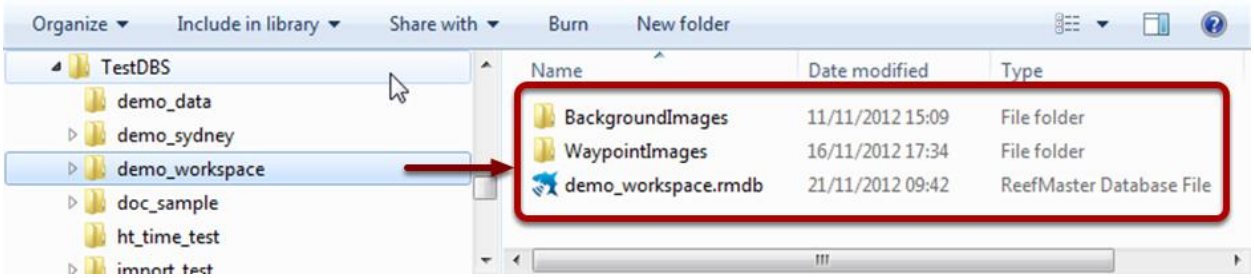


Tide Stations are a special type of asset that contain tide depth variations for particular geographic areas at particular points in time. These depth variations are used to adjust the depths of track points within GPS track logs to eliminate the influence of the tide. This is extremely important when making maps in tidal waters. *ReefMaster* does not provide tidal information; rather, it allows the import of tide data and the use of some third party tide prediction applications.

The Workspace

All data stored within the ReefMaster application is contained within a database file known as a Workspace.

The Workspace



All assets, whether imported from a GPS unit or created within ReefMaster, are stored in a single database file known as a *Workspace*. Workspace files have the file extension .rmdb (***R**eef**M**aster **D**ata**B**ase*). When a new workspace is created, ReefMaster creates a new folder on disk, in which the ReefMaster database file is written. Further data associated with a workspace, for example, images attached to individual waypoints, may be present in sub-folders within the main workspace folder.

Files and folders within the workspace folder should never be edited or deleted.

The above image shows the data and folders associated with the workspace '*demo_workspace'*. Note that the workspace database file *demo_workspace.rmdb* is held within a folder of the same name, minus the file extension Also present within this folder are sub folders that contain background and waypoint images.

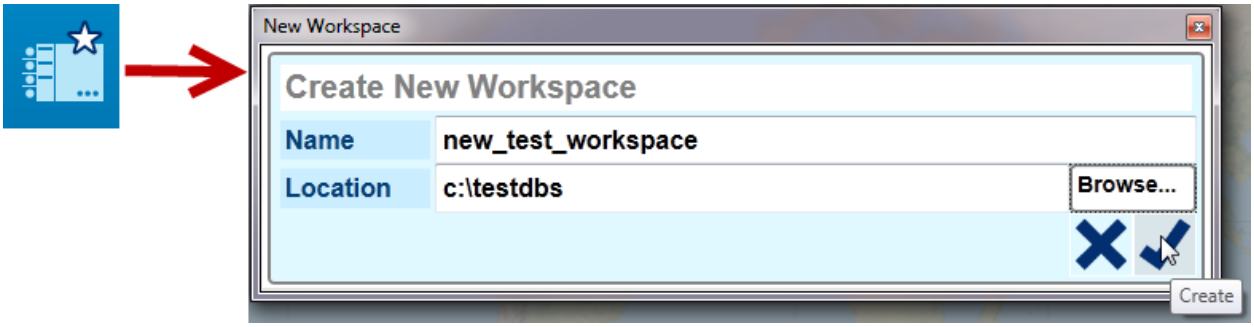
Backing up the Workspace

As always, when saving important data to computer disk, regular back-ups should be maintained. As all of the data required for a workspace is held within the folder that contains the workspace, the simplest way to back-up a workspace is to make a copy of the workspace folder and all of its contents. To save disk space, this can be archived using a compression tool such as *WinZip*™.

Saving Work Within the Workspace

All changes to a workspace - such as importing assets, deleting assets or editing individual assets - are written immediately to the database file. **This behaviour means that there is no separate '*Save*' function within ReefMaster.** There are advantages, and also some disadvantages, associated with not having to explicitly save work. Advantages include the reduced risk of losing work due to application crashes or power outage. A disadvantage is the inability to roll back changes made in error by reverting to a previously saved file. In order to mitigate this, most destructive actions - such as deleting track points or moving waypoints - have an *Undo* facility. Be aware that this undo information is lost once the application is closed.

Creating a new Workspace

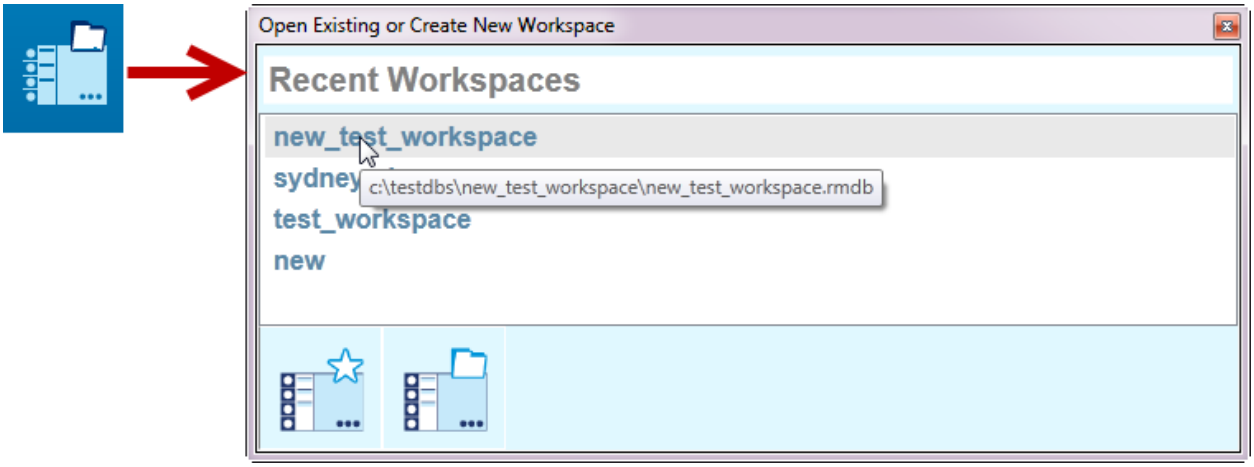


To create a new workspace, use the *New Workspace button* in the *Main Toolbar.*

The *New Workspace* window appears, shown above. Type a name for the new workspace in the *Name* field. Note that as the workspace name also becomes the filename for the workspace folder and database file, only valid filename characters may form part of the name. Invalid characters will be stripped before the workspace is created.

Select a location on disk for the new workspace, either by typing the path in explicitly or using the *Browse* facility. The path can be any location on disk with appropriate write permissions. Once a valid path has been selected, the *Create* button will become enabled. Click *Create* to create the new workspace.

Opening an Existing Workspace



To create a new workspace, use the *Open Workspace button* in the *Main Toolbar.*

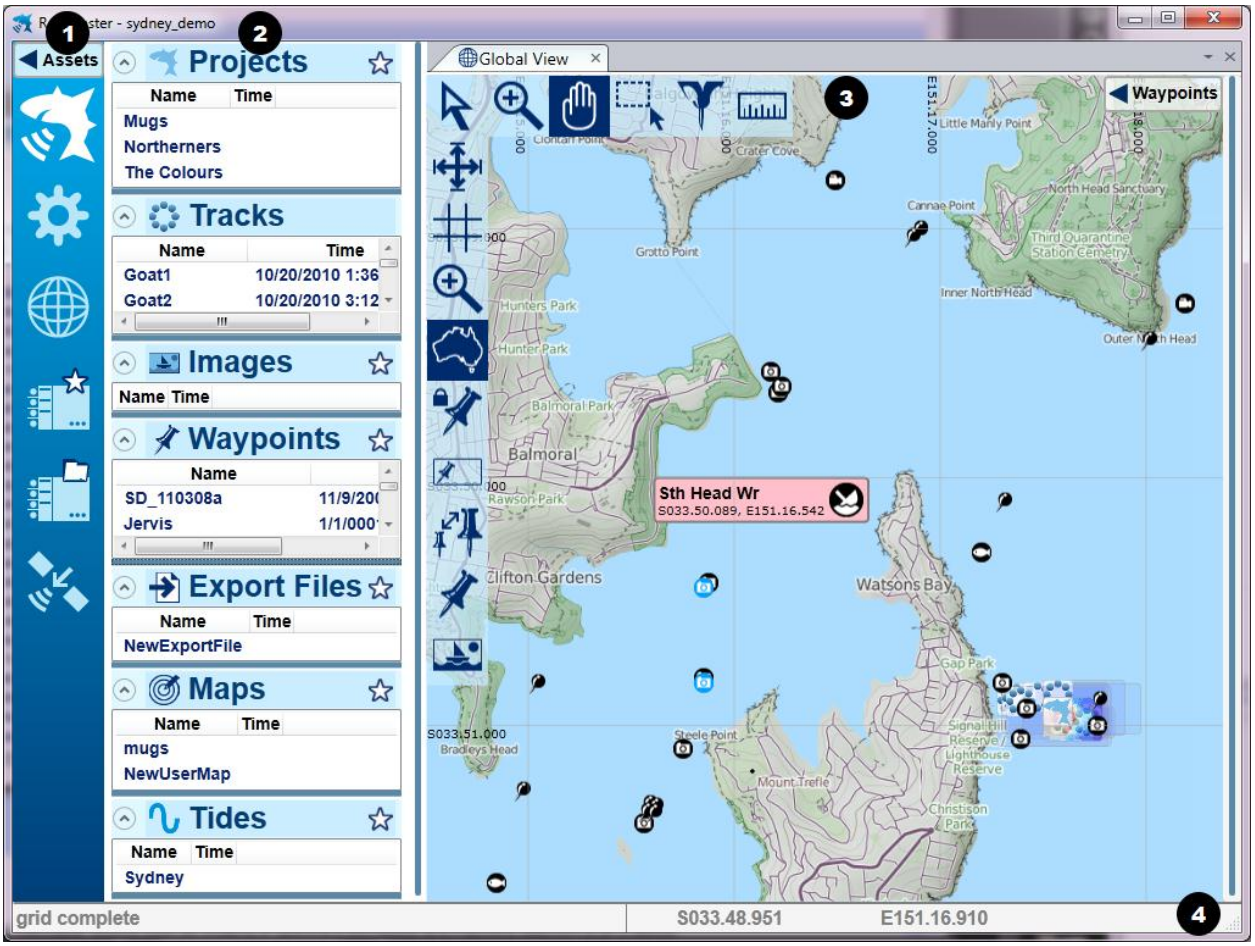
A window showing recent workspaces appears, as well as buttons for creating a new workspace, or browsing to find a workspace not listed in the recent workspaces list.

Holding the mouse pointer over a workspace name will bring up the full disk path of the workspace. This can be useful to disambiguate workspaces with the same name that are stored in different disk locations.

Layout

Application Layout

ReefMaster Application Layout



The ReefMaster application display is split into several main areas:

1. Main Toolbar

2. The Asset Library

3. Edit Window

The main area of the ReefMaster display is occupied by the *Edit Window*.

Individual assets such as tracks and projects are edited in separate tabs within the edit window. Any number of different assets can be opened for editing at any one time. To switch between editing different assets, click the tab header of the asset to be edited to bring that asset's window to the front.

Individual edit windows can also be arranged within the main edit window by dragging the tabs to create the desired window layout. Tabs can also be detached from the main applicatin window to "float" as a separate window if desired, by dragging the tab outside of the Reefmaster window area.

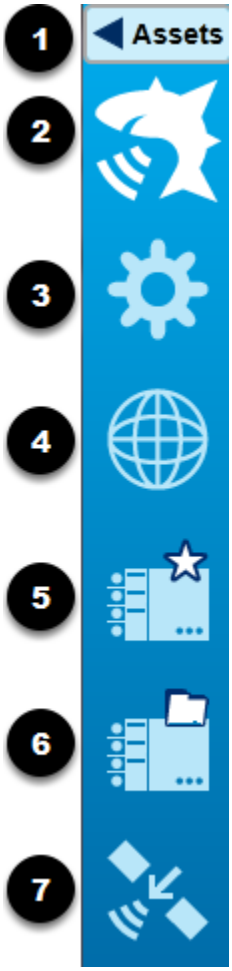
4. Status Bar

Information panels at the bottom of the window show update messages, mouse cursor position in latitude/longitude and also, when available, the depth at the mouse cursor position.

The Main Toolbar

The main toolbar contains buttons for core ReefMaster actions such as creating or opening a workspace and importing data from a GPS device.

Main Toolbar



1. Assets

Show or hide the *Asset Library* window.

2. About

Show the *About ReefMaster* information window.

3. Settings

Show the *Global Settings* window.

4. Global View

Show the *Global View* edit window.

5. New Workspace

Create a new workspace. The *New Workspace* window will open, where a new workspace name and location is entered. The current workspace is closed if a new workspace is created.

6. Open Workspace

Open another workspace. A file browsing window will open, from which a workspace file can be selected. The current workspace is closed if a new workspace is opened.

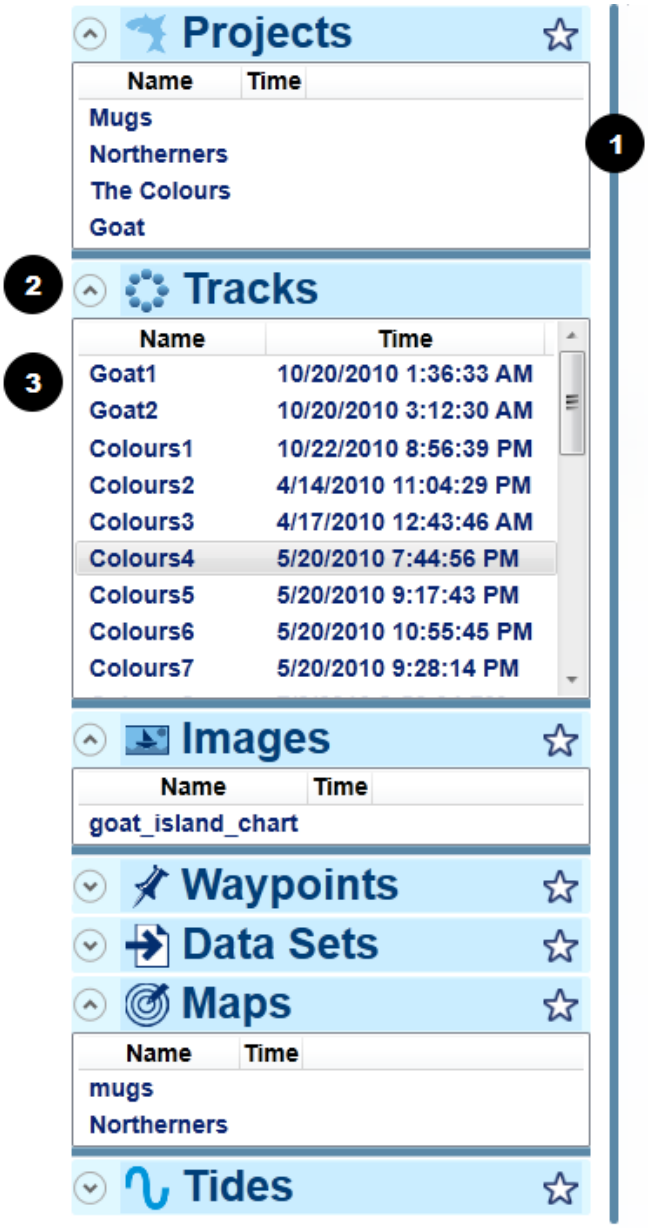
7. Import GPS Assets

Open the *Import GPS Assets* window, to select files containing waypoints and/or track-logs for import into ReefMaster.

The Asset Library

Workspace assets can be viewed and managed using the Asset Library.

The Asset Library

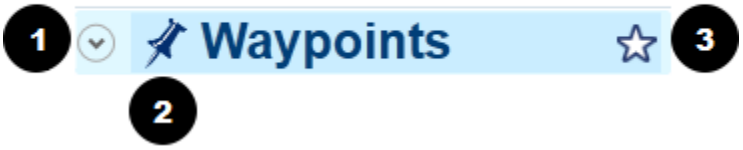


The *Asset Library* contains separate lists of assets for each asset type, where all of the assets loaded in the current workspace can be viewed and managed.

See Assets and Asset Types for an introduction to the data types supported by ReefMaster.

The Asset Library can be shown or hidden using the *Assets* toggle button at the top of the Main Toolbar. When visible, the asset library can be resized using the sizing bar, **(1)**.

2. Asset Type Header



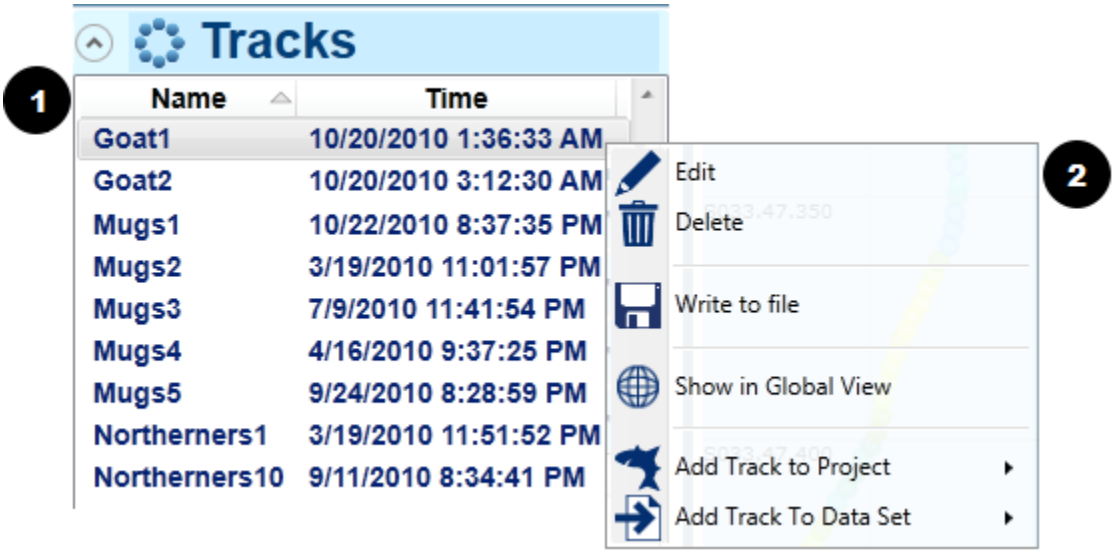
1. Expand or hide the list of assets by clicking anywhere in the asset header.

2. The icon and name of the asset type

3. *New Asset* button.

For all asset types that can be created by ReefMaster - all asset types *except* track - this button creates a new, empty asset of the appropriate type. The new asset is opened for editing after being created.

3. Asset List



Assets are shown in a scrollable list. Assets can be selected by clicking with the mouse, or using the cursor keys.

Multiple assets can be selected by use of the *control* or *shift* keys in conjunction with the mouse or the cursor keys. Note that only assets of a single type can be selected together.

Double clicking an asset opens the *Edit Window* for that asset.

1. Assets are listed by name and, where applicable, time.

The time is the start time of the asset; for tracks, the time of the first track point, and for waypoint collections, the time of the earliest waypoint.

Assets can be sorted by either field simply by clicking on the appropriate column header. Click again to reverse the sort order.

2. Most operations on an asset can be carried out via the *Context Menu* which can be opened by using the right mouse button. The contents of the context menu vary

depending on the type of asset that is selected, and on the number of assets that are currently selected.

Options that are common to most assets;

Edit

Open the asset(s) for editing in their respective *Edit Windows*. If an edit window is already open for the selected asset, it is brought to the front of the open edit windows in the edit area.

Delete

Delete the selected asset(s). The asset(s) are deleted from the database, and removed from any further assets of which they may be a part. For example, if a track is a component of a project, the track is removed from that project before being deleted.

A confirmation window is shown before the assets are deleted.

Write to File

Export the asset(s) to file. The *Export to GPS Window* is opened with the selected assets. Note that since only assets of a single type can be selected together in the asset library, exports containing multiple asset types must be originated some other way; either through the use of a *Data Set* or by selecting assets graphically in the *Global View.*

Show in Global View

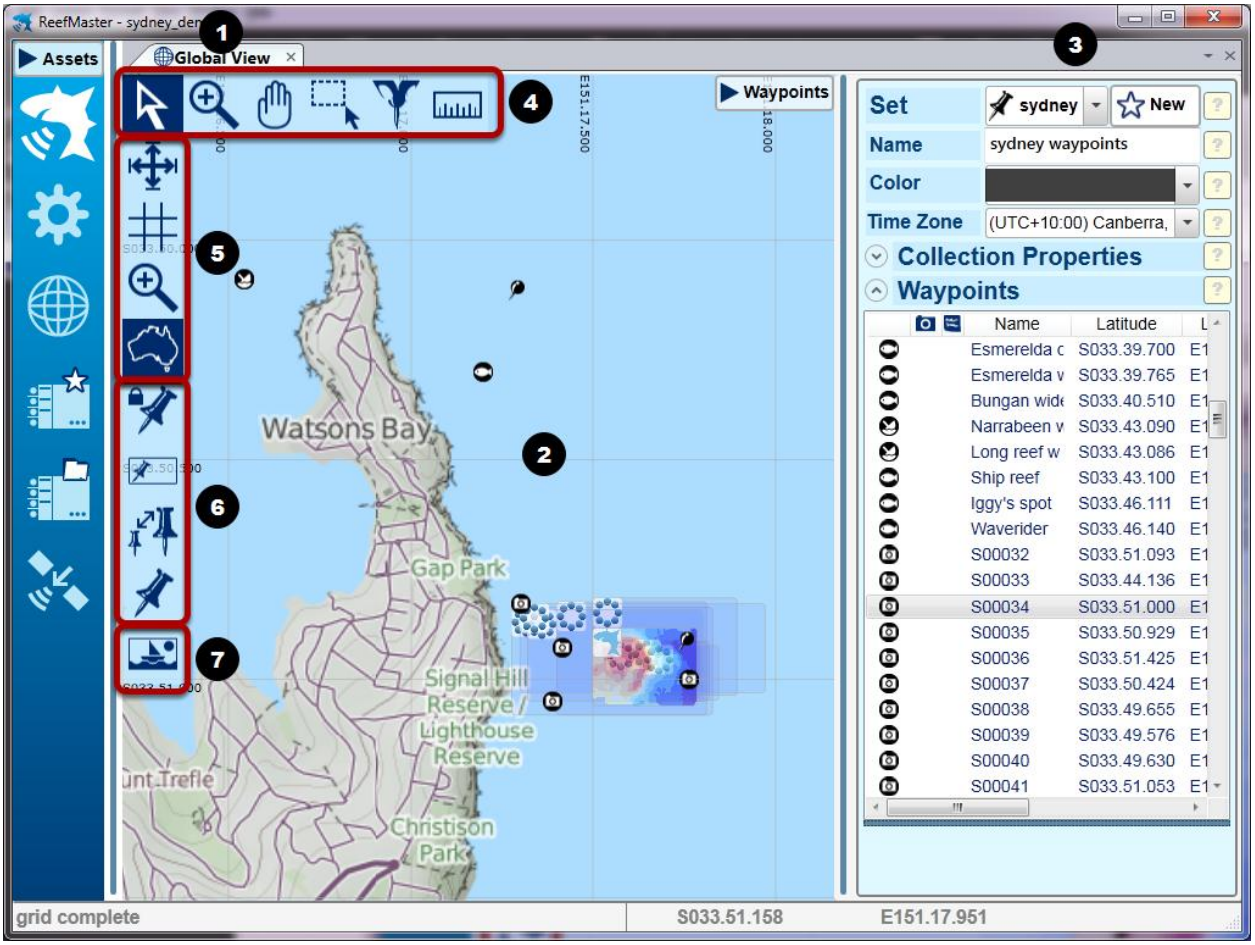
Select the asset in the global view, and zoom and pan the global view as required so that the selected asset can be seen. This option is not available for all asset types.

Other options available in the context menu are asset-type specific. Further information is available in the pages on the individual asset types.

The Edit Window

Edit Windows are where individual assets, such as Tracks, Projects and User Maps, can be viewed and edited.

Example Edit Window - Global View



All edit windows share the same basic layout, with different display and editing options available for different asset types.

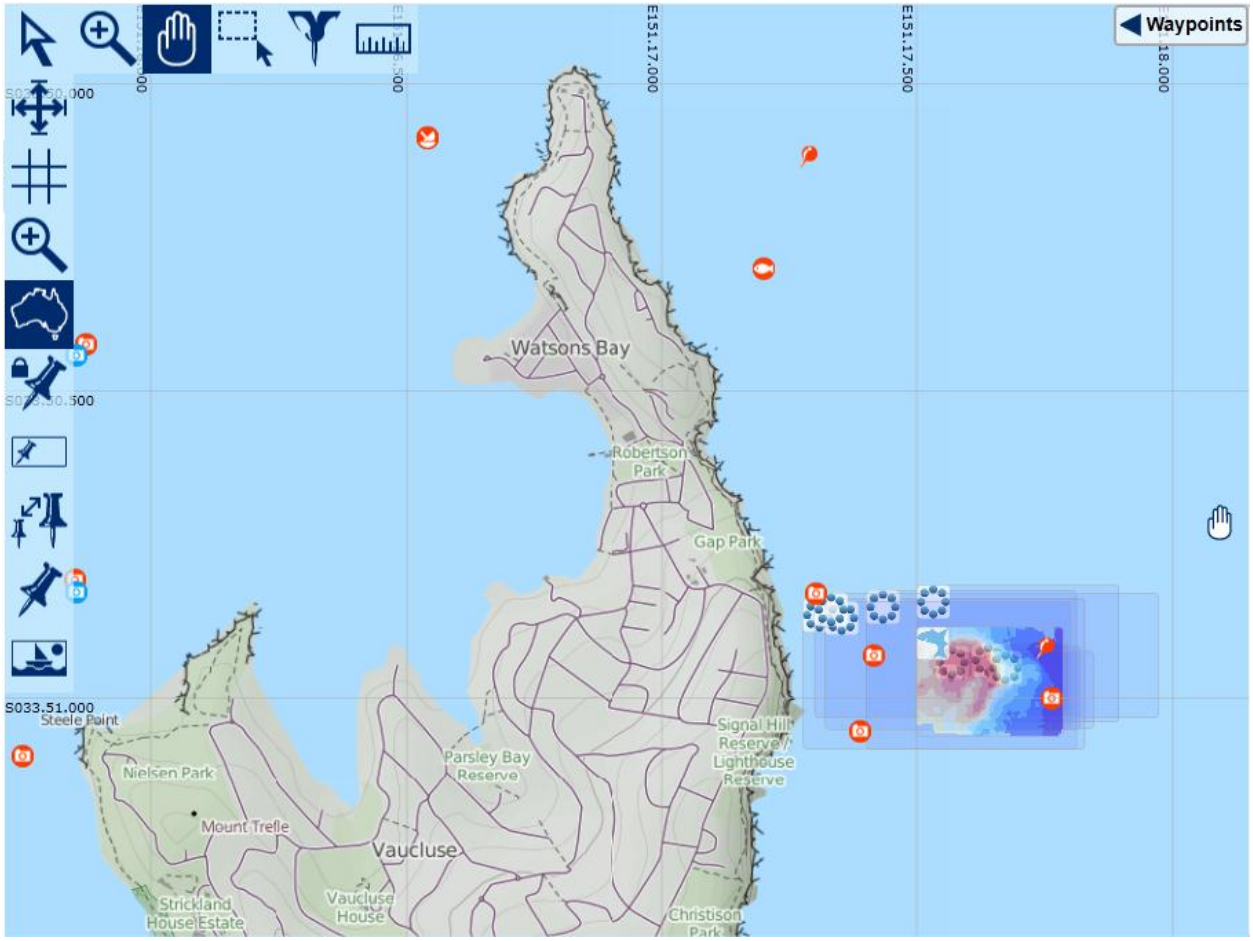
- The main area within an edit window contains a graphical representation of the asset(s) to be edited.
- This area can be zoomed (using the mouse wheel, or one of the *Zoom* tools), and panned (using the mouse in *Pan* mode).
- Toolbars for selecting the mouse mode **(4)** and selecting display options **(5, 6, 7)** are superimposed at the top-left, and left of the screen respectively.
- For most asset types, an *Edit Pane,* with further edit controls and properties, is present at the right of the window; expand the edit pane using the toggle button at the top right of the main edit area.

1. Edit Window Tab

Tab shows the icon of the edit window asset type, the asset name ("*Global View*" in the above example) and a *Close* button.

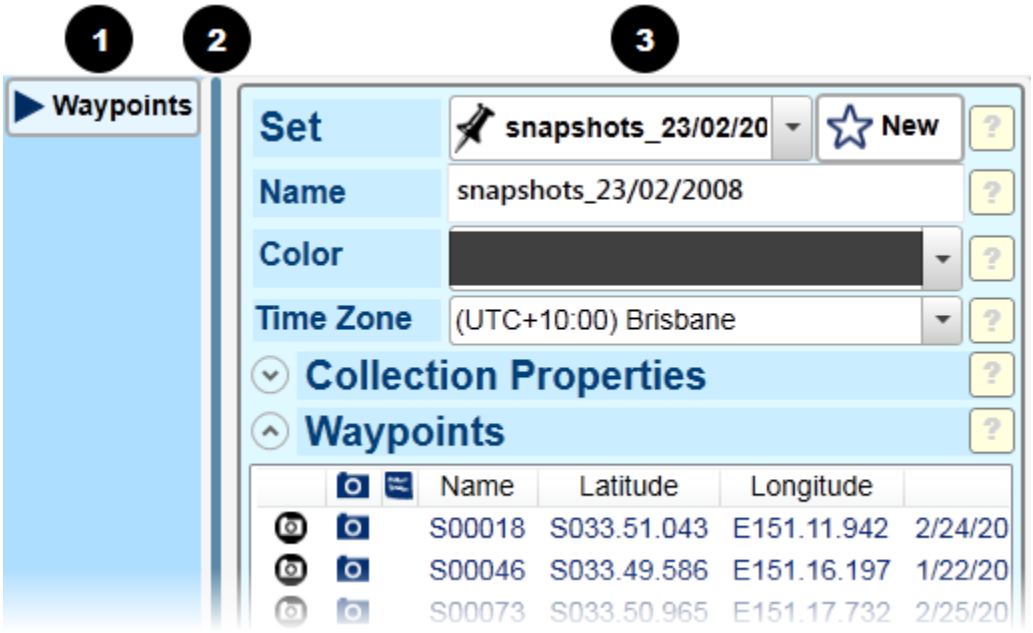
Note that as all edit updates to assets are saved as they occur, so changes do not need to be explicitly saved before a window is closed.

2. Edit Window Work Area



- The main area of the edit window shows a graphical representation of the asset being edited. Depending on the type of edit window, other assets may also be shown (eg. Waypoints).
- Background maps may be shown along with grid lines to help visualise the location of an asset.

3. Edit Pane



The *Edit Pane* contains properties and in depth edit controls for the asset that is currently being edited.

The edit pane can be shown or hidden using the toggle button shown at the top-right of the edit area **(1)**.

Once expanded, the relative size of the edit pane can be adjusted by dragging the blue divider bar **(2)**.

The contents of the Edit Pane varies with the type of the asset currently being edited. The image above shows the waypoints edit pane, which is part of the global view **(3)**.

4. Mouse Mode Selector Toolbar

The mouse mode selector toolbar is used to select what operation the left mouse button performs. The available options vary depending on the asset type being edited; the options shown above are common to most asset types. The mouse cursor within the edit area changes to reflect the selected mode. The selected mode is also highlighted within the toolbar; in the example above, the *Pan* mode is selected.

The mouse wheel is always used for zooming; push the wheel forwards to zoom in, and backwards to zoom out.

The right mouse button is used to activate a *Context Menu*, where applicable.

1. Select

Select is the default mouse mode. In select mode, a single click of the left mouse button selects an item in the display, if the item is selectable. If an item can be edited, double-clicking the left mouse button on the item will open that item for editing.

2. Zoom Box

A *Zoom Box* is used to zoom the edit area to fit a rectangular area drawn by holding the left mouse button down and dragging the mouse.

3. Pan

In *Pan* mode the entire contents of the edit area can be 'grabbed' and panned.

4. Region Select

The *Region Select* tool is used to select multiple items within the edit area. All items are selected within a rectangular region defined by holding the left mouse button down and dragging the mouse. Operations that can be performed on the selected assets vary according to the asset type(s) selected, and the type of edit window in use.

5. Drop Pin

Drop a *Waypoint*. Clicking the left mouse button when in this mode drops a waypoint at the point underneath the tip of the mouse cursor. An *Edit Waypoint* window appears where further information, such as the waypoint name, can be entered.

6. Ruler

Measure a distance between two points. Click and hold the left mouse at the start point and move the mouse pointer to the second point; the ruler updates as the mouse is moved.

Note that the measure tool measures the shortest distance between two points on a constant bearing (along a 'rhumb line'). This is not the same as the shortest geographical distance ('great circle'), although the difference is not significant at the short distances typically required for measuring maps, waypoint distances etc within ReefMaster. Another effect of this behaviour is that distances shown on the ruler tool may appear to reduce as the ruler length is increased to over half the circumference of the earth. This is because the calculated distance is the shortest along the specified bearing, and is shorter going the other way around the earth.

5. Map View Toolbar

1. Fit Window

Zoom the display area to fit the geographical extent of the asset being edited.

2. Show Grid Lines

Show or hide the map grid lines, and vary the frequency of the lines. A slider is shown when this button is pressed. Moving the slider to the right increases the density of grid lines shown on the map. Moving the slider all the way to the left removes the grid lines entirely.

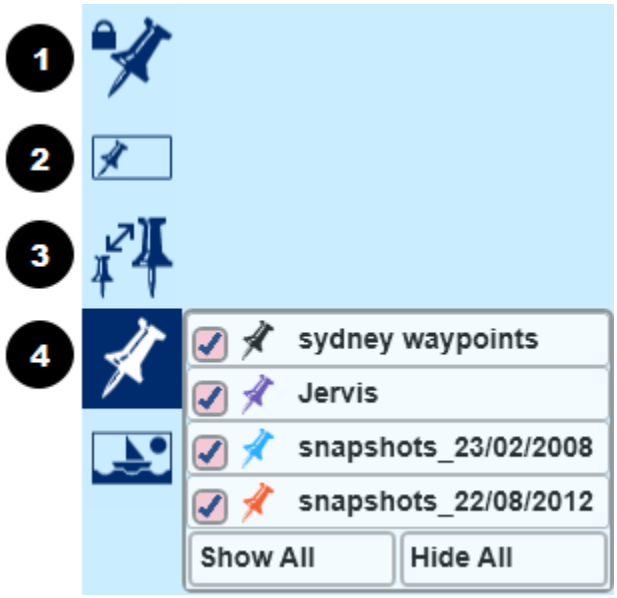
3. Zoom

Another way of zooming the map. A slider is shown; moving the slider to the right increases the zoom level, whilst moving the slider to the left zooms out. Zooming using the zoom slider is centered on the middle of the edit area.

4. Show Background Map

Show or hide the background map using the *Show Background Map* toggle button. The map which is shown can be selected in *Global Settings*.

6. Waypoints Toolbar



The *Waypoints Toolbar* is used to configure how waypoints are displayed.

1. Lock or Unlock Waypoints

Locking waypoints prevents them from being dragged by the mouse (when using the *Select* tool), which is useful to prevent accidentally moving waypoints. Use the *Lock or Unlock Waypoints* button to toggle the waypoint lock; the icon will change to an unlocked padlock when waypoints are unlocked.

Waypoints are locked by default; a large padlock is superimposed on the edit area when trying to drag a locked waypoint.

2. Show or Hide Labels

Show or hide waypoint name labels using the *Show Labels* toggle button. Note that display performance can be reduced if a very large number of waypoint labels is shown on screen.

3. Waypoint Size

Waypoints can be shown in two sizes; large and small. Use the *Waypoint Size* toggle button to switch between the two.

4. Show or Hide Waypoint Sets

Toggle the display of individual waypoint sets within the edit area. A list of avaiable waypoint sets is shown when the *Show or Hide Waypoint Sets* button is pressed. Toggle the display of individual waypoint sets individually using the check-boxes shown next to each waypoint set. Use the *Show All* or *Hide All* buttons to show or hide all waypoints.

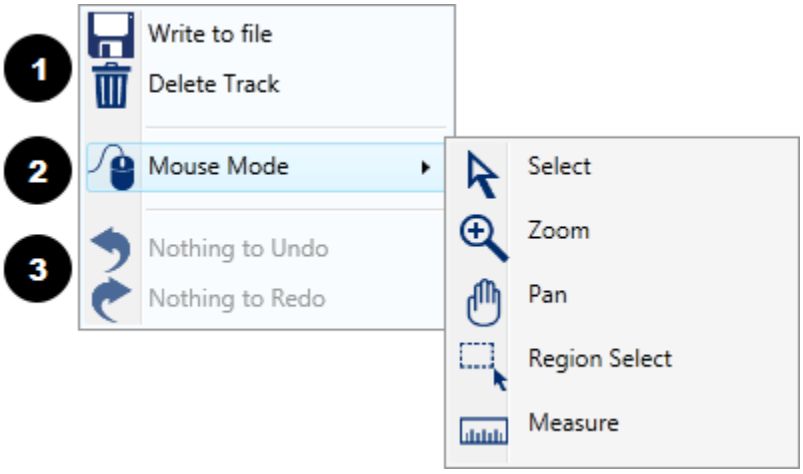
7. Background Images Toolbar

Background images can be shown using the *Show or Hide Images* control.

When the *Show or Hide Images* button is pressed, a list of all available images is shown.

- Image visibility can be toggled for individual images using the checkboxes adjacent to each image, or for all images using the *Show All* or *Hide All* buttons.
- The opacity of individual images can be changed using the *Opacity* slider shown to the right of the image name.

Context Menu



The screen-level context menu can be activated using the right mouse button whilst the mouse pointer is held over open space in the graphical edit area - ie, the pointer is not held over an asset. Different asset edit windows have different options available in the context menu, with some operations common to most asset types.

The example image above shows the screen-level context menu for the edit track window, whose options are common to most asset types;

1. Export or Delete the current asset.

Write the current asset to file for import to a GPS device, or delete the current asset (a warning window is shown).

2. Select mouse mode.

The options are the same as those in the *Mouse Mode Selector Toolbar.*

3. Undo or Redo a recent edit operation.

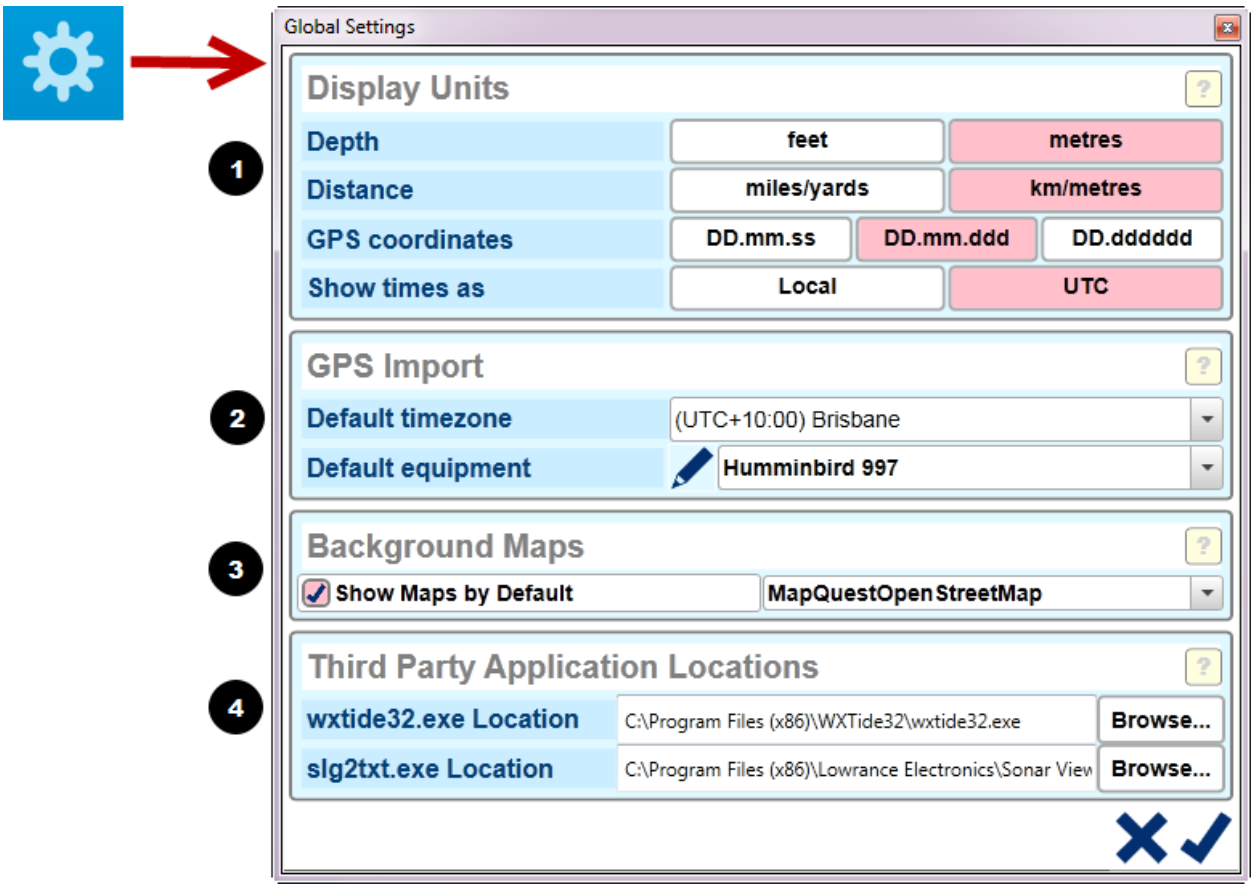
Asset specific undo or redo of edit operations. Not all edit operations can be undone.

Configuration

Global Settings

Application-wide configuration and display settings.

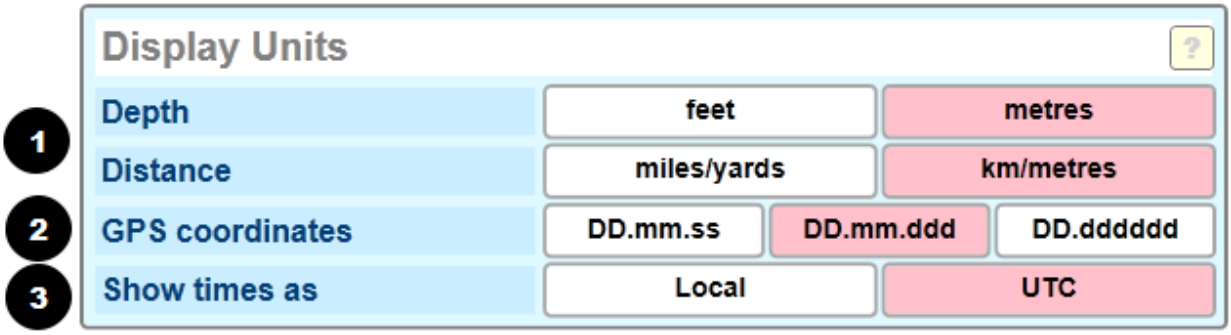
The Global Settings Window



Open the *Global Settings* window using the *Global Settings* button on the Main Toolbar.

The Global Settings window contains options for for settings that are applied application-wide, such as depth and distance units, import defaults and map settings.

1. Display Units



Display units settings determine how values are displayed within the ReefMaster application. The Settings affect all areas of the application that show such values.

1. Depth and Distance

Depth and distance can be shown in imperial/US measurements - feet for depth and mils/yards for distance - or metric, with metres for depth and kilometres/metres for distance.

The choice of depth units affects the contour line spacings that are generated in map projects; contour lines are generated on natural boundaries of the selected unit, for example 3 feet or 1 metre. Changing the depth unit in use will cause contour lines for existing map projects to be regenerated.

2. GPS Coordinates

GPS coordinates can be shown in one of three formats; Degrees, minutes, seconds; Degrees, minutes, decimal minutes (the default) and decimal degrees.

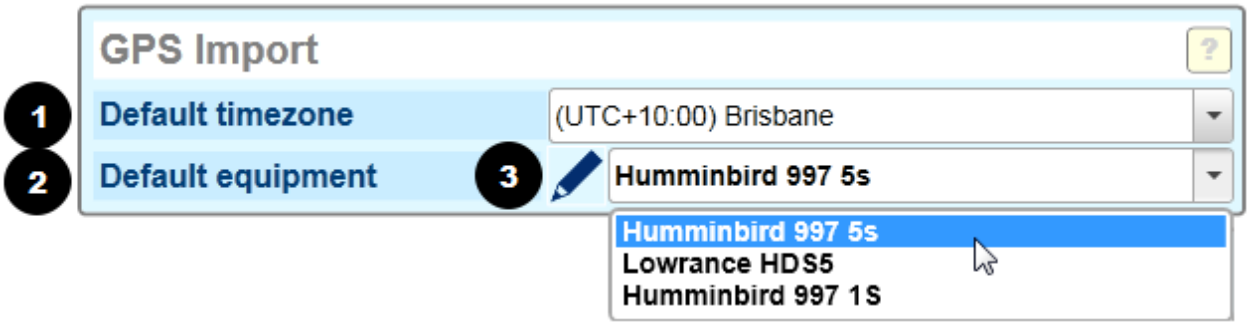
Note that all GPS coordinates within ReefMaster use the WGS84 datum. ReefMaster does not convert between GPS datums.

3. Time

Show times as Local or UTC *(Universal Time Coordinated, functionally equivalent to Greenwich Mean Time).*

Assets are assigned a timezone which is used to calculate the local time for display. This allows different assets to maintain different timezones if required. Note that all times are stored internally as UTC and the *Show Times As..* option only changes how these times are displayed.

2. GPS Import



Assign default values used during the GPS Import process. These values can also be changed during the import process.

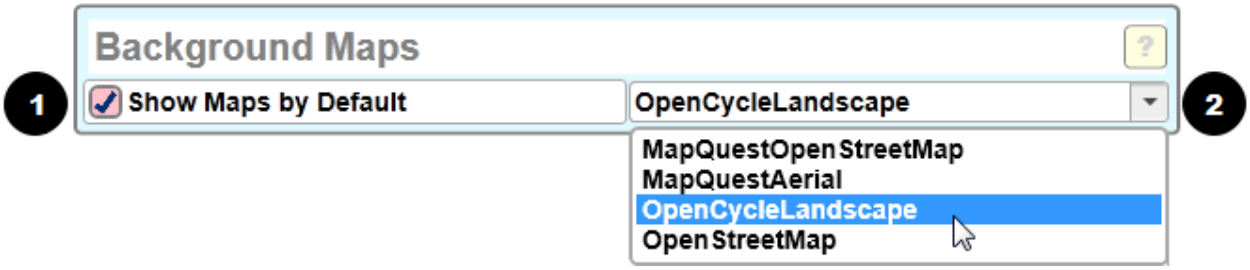
1. Default Timezone

The default timezone when importing GPS assets. By default, this is the timezone set in the operating system.

2. Default Equipment

To simplify switching source devices during import, values associated with specific GPS/Sounder devices, such as *Cone Angle* and *Keel Offset* are grouped together into a *GPS Sounder Profile*. Change the profile used by default during import by selecting a profile from the drop-down list box. To add a new profile, or edit an existing one, use the *Edit* button, **3**.

3. Background Maps



1. Show Maps by Default

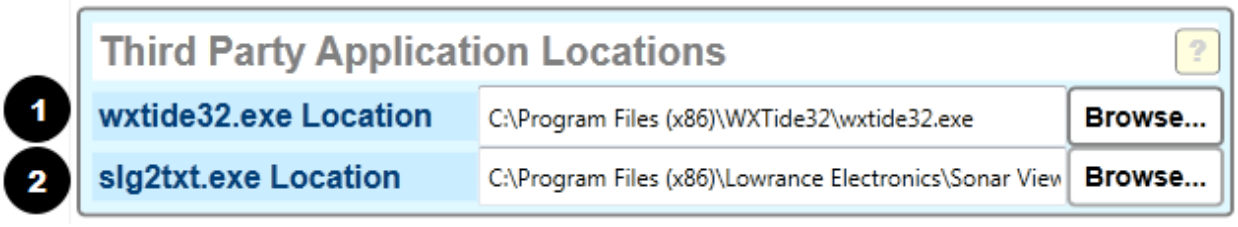
Background maps can be shown in the graphical edit windows.

Individual edit windows have the option to show or hide background maps. The *Show Maps by Default* option determines whether maps are shown or not when an edit window is first opened. Since map tiles are downloaded as required, it can be useful to uncheck this option when operating ReefMaster with reduced or zero internet connectivity.

2. Map Source

Map providers can be chosen from a selection in the drop-down list. Not all map providers provide maps for all locations at all zoom levels. For example, Map Quest Ariel provides much more detail over the continental US than for the rest of the world. Choose the map provider that provides the best results for your area of interest.

4. Third Party Applications



ReefMaster relies on third party applications to perform some functions.

1. WxTide

WXTide is a free program that provides tidal predictions for much of the world. *ReefMaster* can use tide information from *WXTide* to tide adjust track-point depths. This is important for accurate mapping in tidal waters. *WXTide* can be installed from http://www.wxtide32.com/. Once installed, locate the **WXTide32.exe** application file using the ***Browse*** button.

In a default installation, the application will be in directory "**C:\Program Files (x86)\WXTide32"**.

2. slg2txt.exe

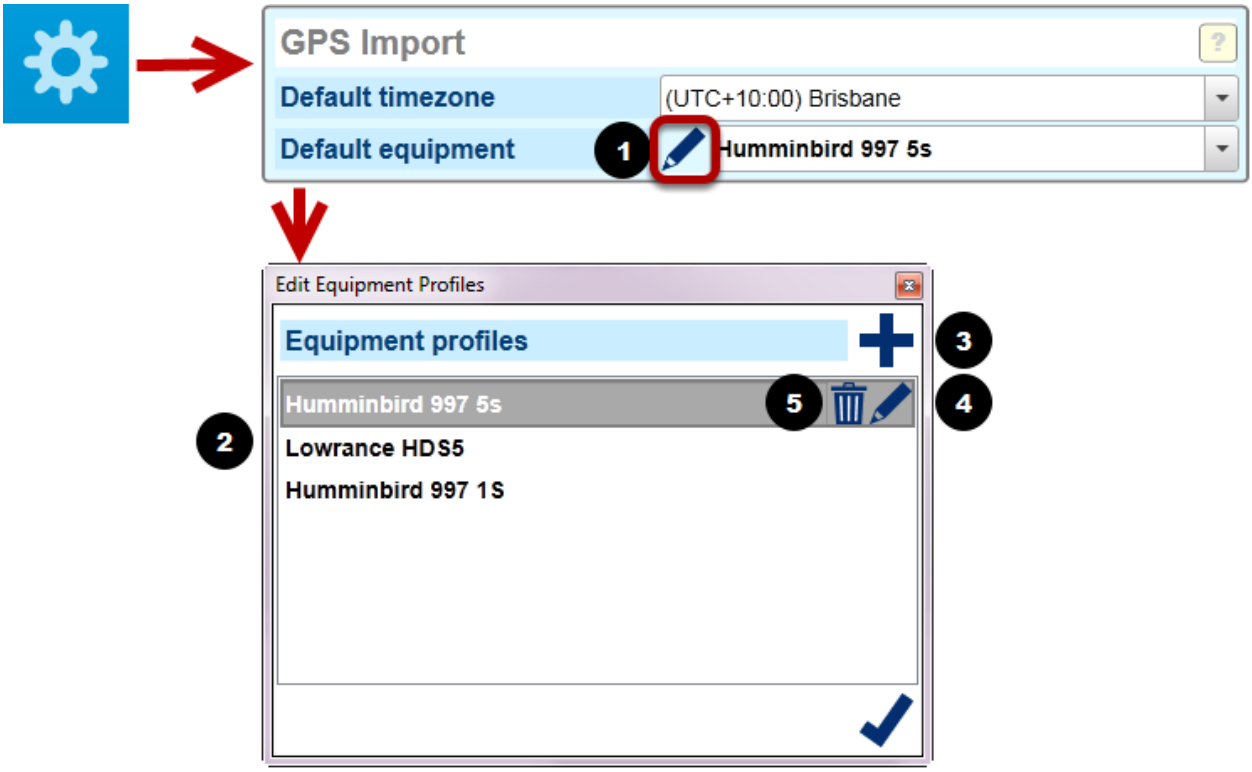
Slg2Txt is a program provided by *Lowrance*™, as part of their *SonarViewer* application, that converts sonar log recording files to text files that can be imported into *ReefMaster* as track logs with depth information. Once *SonarViewer* is installed, use the ***Browse*** button to locate the **slg2txt.exe** application file.

In a default installation, the application will be in directory "**C:\Program Files (x86)\Lowrance Electronics\Sonar Viewer*<version_number>"***.

GPS Sounder Profiles

Grouped parameters for specific GPS devices are referred to as Equipment Profiles.

Adding or Editing an Equipment Profile



1. From the *Global Settings* window, select the *Edit* button next to the *Default Equipment* drop-down list box.

2. A list of available profiles is shown in a new window.

3. Click the *Add* (+) button to create a new profile, or..

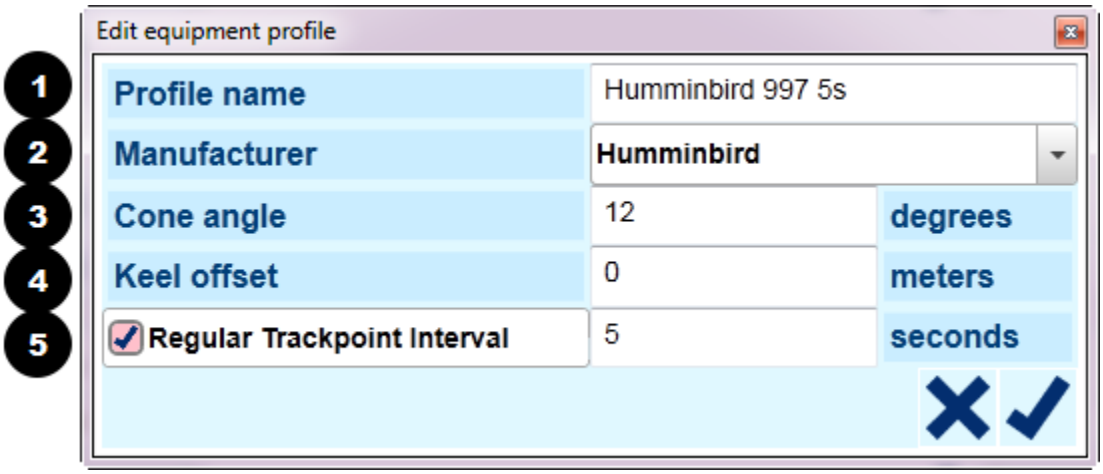
4. ..select an existing profile and click the *Edit* button within the profile row.

5. To delete an existing equipment profile, click the *Delete* button in the selected equipment profile row.

The *Edit Equipment Profile* window will open, either showing the existing profile that has been selected for editing, or a new profile with some default values.

Note that the equipment profile list can also be accessed from the Import GPS Data window.

Edit Equipment Profile Window



GPS/Sounder profiles, also referred to as *Equipment Profiles*, are a way of grouping the properties of a GPS device from which data is imported into ReefMaster.

Grouping these properties together into a set, or *Profile,* that can be selected during import makes switching between GPS source devices easy. Separate profiles may also be used for the same physical source device, when importing data generated using different settings. For example, trackpoints may be generated at different time intervals depending on the configuration of the GPS device. A separate profile can be maintained for each different time interval used. The example above shows a profile for a *Humminbird*™ GPS/Sounder unit with a five second track point interval.

1. Profile Name

A user-friendly name for the profile. The name is used to select the profile during the import process, so it is useful to make it descriptive.

2. Manufactuer

When importing waypoints from GPX files, waypoint symbols are described as text strings. ReefMaster cannot always guess the correct source of the GPX file, which could be from a number of different device manufactuers. Setting the manufacturer here helps ReefMaster translate proprietry waypoint symbol strings to the appropriate ReefMaster waypoint symbol.

This setting is only used when importing waypoints from GPX files and can be safely ignored, and left to *undefined,* if waypoints are not being sourced from GPX files, or if the waypoint symbol within ReefMaster is not of concern.

3. Cone Angle

The angle of the sonar beam from within which the depth is determined. This value applies to track logs, and can be changed post-import within the track edit pane.

Use the transducer cone angle specified by the source device as a starting point for this value, although as the GPS device may effectively use a narrower angle when determining depth., experimenting with smaller values may yield better results. If the source device is running multiple frequencies, use the narrower of the two cone angles.

4. Keel Offset

This setting applies to track logs.

A fixed depth offset that is applied to all track points in the track. This depth represents the depth under the water surface of the transducer mounting position.

5. Trackpoint Time Interval

This setting applies to track logs that are imported from GPX or *Humminbird™ Track (.HT)* files.

Some devices do not record the time of each individual track point within a track log, but instead log track points at specific time intervals. *Humminbird* is an example of a manufacturer who records tracks in this way.

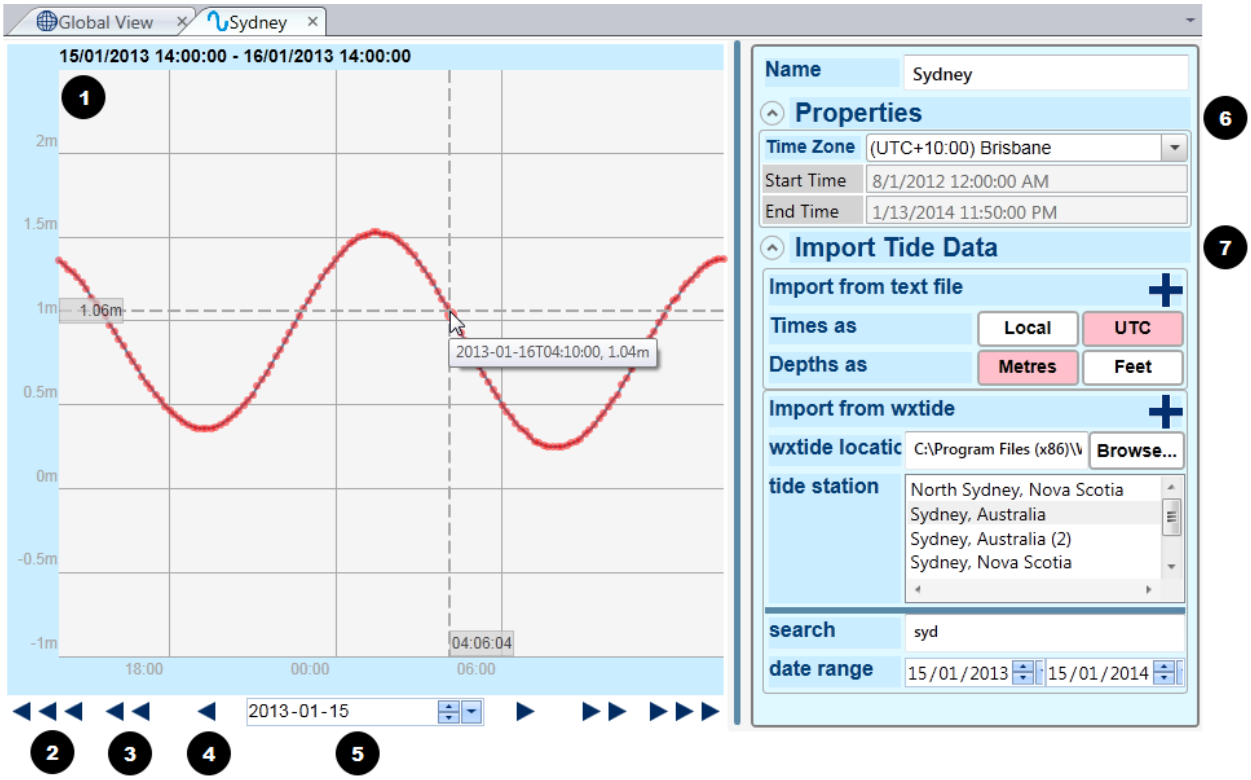
When sourcing track log data from a source that uses regular track point spacing, check the *Regular Trackpoint Interval* option and enter the track point spacing. The track point spacing is configurable on the GPS/Sounder source device. It is important that the correct value is used during import in order to assign the correct relative times to the track points within the track log.

See Importing GPS Data for further discussion on the importance of track point timing and some of the potential difficulties in obtaining correct track point times.

Tide Data

Stored water level offsets used to adjust track log data

Tide Stations



When making maps from data gathered in tidal waters or over multiple trips from lakes at varying water levels, it is important to adjust track point depths to compensate.

Track point depths within ReefMaster can be adjusted using either manually entered, track specific depth points (see *Tracks*) or through the use of a *Tide Station*, which is a collection of time/depth values that can be shared across tracks.

A *Tide Station* contains a list of time/depth values that have been imported into ReefMaster, either from a comma-delimited text file or from the program *WXtide.*

ReefMaster does not provide tide information, nor does ReefMaster warrant that tide information imported from any suggested source is correct. Tide Station functionality within ReefMaster is simply a method of storing externally sourced tide offset data.

WXTide

WXTide is a free program that provides tidal predictions for much of the world. *ReefMaster* can import tide information from *WXTide* and save it in a tide station. *WXTide* can be installed from http://www.wxtide32.com/. Once installed, locate the **WXTide32.exe** application file using the ***Browse*** button. In a default installation, the application will be in directory "**C:\Program Files (x86)\WXTide32"**.

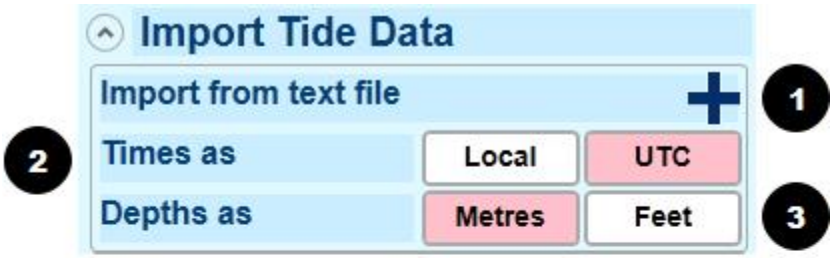
- To create a new Tide Station, use the *New Asset* button in the *Asset Library*.
- Tide Stations can be opened for editing in the same way as any other asset, by double clicking or using the right mouse button context menu.
- Tide data for a 24 hour period is shown in the graphical edit area **(1)**. Further information, including tide depths interpolated between tide points, can be displayed by moving the mouse within the graph.
- The displayed time period can be adjusted using the year **(2)**, month **(3)**, and day **(4)** arrows, or the date selector **(5)**.
- The name and time zone of the tide station can be changed **(6)**. Time zone is important when importing data from a text file in local time (see below).
- The date range of imported values is shown as a pair of read only values in the *properties* section.
- Data can be imported from text files or WXTide (see below).

Importing Data Fundamentals

Some principles apply whether data is imported from a text file or from WXTide:

- Data is saved to the database and keyed on time.
- If, during import, a data point already exists for a specified time, it is updated with the new depth.
- Data can be mixed and matched from tide stations and data files. This can be useful for filling in missing time periods etc, but can also lead to errors. ReefMaster does have the capacity to warn on inconsistent tide data, it is up to the user to ensure that the data is appropriate.
- If the data within a tide station needs to be updated, it is safer to delete the tide station entirely and create a new one.
- The number of new or updated tide points added during an import is shown in the *Status Bar* once the import has completed.

Importing Tide Data from a Text File



4

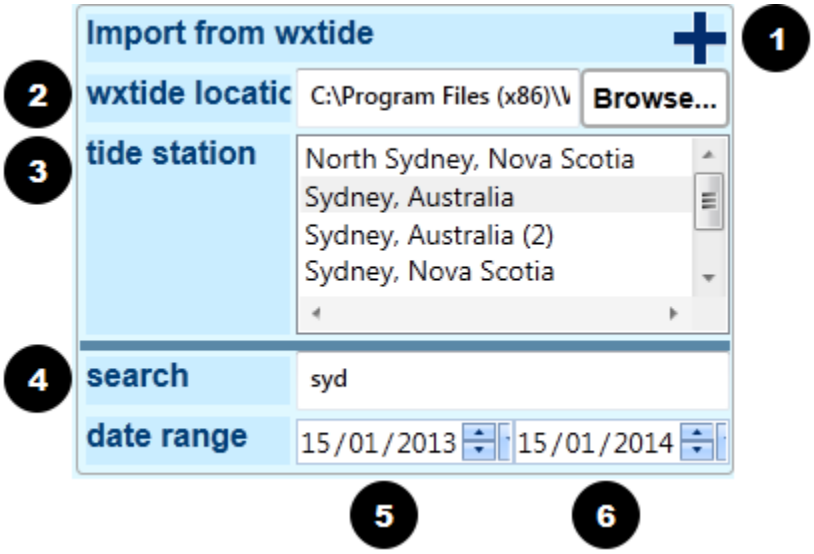
```
2012-08-01 05:00:00,2.5
2012-08-01 06:00:00,2
2012-08-01 07:00:00,1.3
2012-08-01 08:00:00,0.8
2012-08-01 09:00:00,0.5
2012-08-01 10:00:00,0.6
2012-08-01 11:00:00,0.8
```

Tide data is simply a collection of time/depth value pairs.

- Data from a comma-delimited text file can be imported using the *Import* button, **(1)**.
- Times in the text file may be represented in local or UTC times. ReefMaster cannot determine this on its own, so ensure that the option is set correctly here **(2)**. Note the time zone used is the time zone specified in the tide station properties, above.
- Depths within the text file may be in metres or feet. Set this option here **(3)**.
- The format of the text file **(4).** The file must contain pairs of time/depth values as shown above. There should be no units suffix to the depth values. The time can be represented in any standard format. There must be only one comma character per line.
- Lines that are incorrectly formatted are ignored. Check the status bar after import has completed to see how many values were successfully imported.

- The source file can have any file extension. By default, ReefMaster looks for files of type *.txt and *.csv.

Importing Tide Data from WXTide



ReefMaster can invoke *WXTide* automatically and import tide information from a specified tide station, for a specified time interval.

- Data is imported using the *import* button **(1)**.
- The WXTide executable must be located before it can be used. This can be done in the *Global Settings* or **(2)**.
- The list of available tide stations from within WXTide is shown **(3).**
- The list of tide stations can be searched by typing a serarch string in the text box **(4)**. The list of tide stations adjusts automatically to match the entered search string.

- The date range for the import is specified using from **(5)** and to **(6)** fields. Dates can either be typed in or selected using the data picker control. Importing long time periods of data may take a significant amount of time.

Importing GPS Data

GPS Data Sources and File Types

Importing track logs and waypoints from a GPS device.

Transferring Data From a GPS Device

Before data can be imported into ReefMaster it must first be transferred from the source device.

The most comon method of transferring data from a physical GPS/Sounder device is via a *Memory Card*.

Consult the documentation that came with your GPS device for information on how to transfer data onto a memory card. For later model *Humminbird* units, for example, there is an option *Export All Nav Data* which transfers all saved tracks and waypoints.

Once data is has been transferred onto a memory card, the card should be connected to the PC that is running ReefMaster. Although the data can be imported directly into ReefMaster from a connected memory card, it is recommended that data is first transferred to an area on the host PC, where it can be stored and is available fo re-import to ReefMaster if required.

If the file type of the data from the GPS unit is not directly supported by ReefMaster, it must be converted into a format that is. For example, native *Garmin* data must be converted to the GPX format.

Supported File Types

ReefMaster is able to read a range of file types containing track and waypoint data;

GPX (GPs eXhange)

The GPX file format is a common file format for the exchange of GPS data between different device manufacturers.

The GPX format supports waypoints and track logs, but does not support depth information for track points as standard. *Humminbird*™ and *Garmin*™ provide extensions to the track format which includes the depth of each track point. Tracks contained in GPX files generated by *Humminbird*™ or *Garmin*™ devices or applications can be used to generate maps so long as the depth information is present. Tracks contained in GPX files from *Lowrance*™ units cannot be used to create maps, although they can be imported as zero-depth tracks.

When using GPX files as the source of track log information, it is required to use the *Regular Trackpoint Interval* option, and to set the track point interval to correspond to the settings of the source device.

Humminbird™ Track (.HT) and Humminbird™ Waypoints and Routes (.HWR) files

Humminbird GPS/Sounder units export tracks and waypoints to two separate file types, *Humminbird Track* (.HT) and *Humminbird Waypoints and Routes* (.HWR) files. A separate .HT file is produced for each track that has been saved in the unit (typically up to a maximum of 50). These files have the name 00.HT thru <XX>.HT, where <XX> is the number of saved tracks on the unit. A single .HWR file is produced containing all of the waypoints and routes in the system. These files are stored in a folder called *MATRIX* which is positioned at the root of the memory card.

When using .HT files as the source of track log information, it is required to use the *Regular Trackpoint Interval* option, and to set the track point interval to correspond to the settings of the source device.

Note that there is a bug present on many older Humminbird™ units that resets track-point depths to zero once the current track has filled (about 21000 track-points) and started overwriting from the beginning. Once this has happened, all depths associated with the existing current track are lost and cannot be retrieved. This problem can be mitigated by saving areas of interest into one of the available saved track positions as they are recorded, or in any case before the maximum number of track-points has been exceeded. At a one second track-

point interval, a single Humminbird™ track provides approcimately six hours of recording time.

Humminbird™ .DAT Files

Humminbird .DAT files contain information about sonar log files (.SON) and waypoint snapshot files - see below.

Humminbird™ Sonar Logs (.SON)

Humminbird units log sonar to data files within a directory named *RECORD*. Within this directory there is a .DAT file for each sonar recording that has been made, along with an associated sub-directory of the same name, which contains the actual sonar recording files. For example, a recording named R00008 will have a file named R00008.DAT and a sub-directory named R00)08. The sub-directory contains a series of .SON sonar recording files, one for each recorded channel. On a side imaging unit, for example, you may find four .SON files named B000.SON thru B003.SON. Typically, the zero numbered file contains 83khz data, number one contains 200khz data and two and three hold the left and right channels of the side imaging data. ReefMaster only imports data from the 200khz channel.

To import a Humminbird sonar log, select the .DAT file in the RECORD directory. ReefMaster will locate and load the appropriate .SON file.

Note that older (pre v4.x) versions of the Humminbird sonar log file format do not contain depth information and are not supported by ReefMaster.

Humminbird™ .DAT Screen Snapshot Files

Some *Humminbird*™ devices can be configured to save an image of the unit's screen to file every time a new waypoint is taken. This option can be very useful for recording extra information with a waypoint, such as the view of the 2D or side imaging sonar at the time. Humminbird™ saves a data file with waypoint location information, with the extension .DAT, alongside the image file.

ReefMaster is able to import .DAT files as individual waypoints, along with the associated image file.

DAT files and the associated image files are stored in a folder named SNAPSHOTS, stored at the root of the memory card.

Lowrance™ Sonar Logs (.sl2 and .slg) files

Because *Lowrance*™ units do not save depth information with track logs, sonar logs are used to retreive the depth information required for mapping.

ReefMaster does not interpret the sonar log files directly. Instead, the data is first run through a *Lowrance*™ application that converts the sonar log files into text files that can be read by ReefMaster. In order to import *Lowrance*™ sonar log files, it is first necessary to download and configure the **slg2txt.exe** application - see Global Settings.

Track points imported from sonar log files are saved with explicit time information. Consequently the option *Regular Trackpoint Interval* should be unchecked in the import equipment profile.

Lowrance™ .usr files

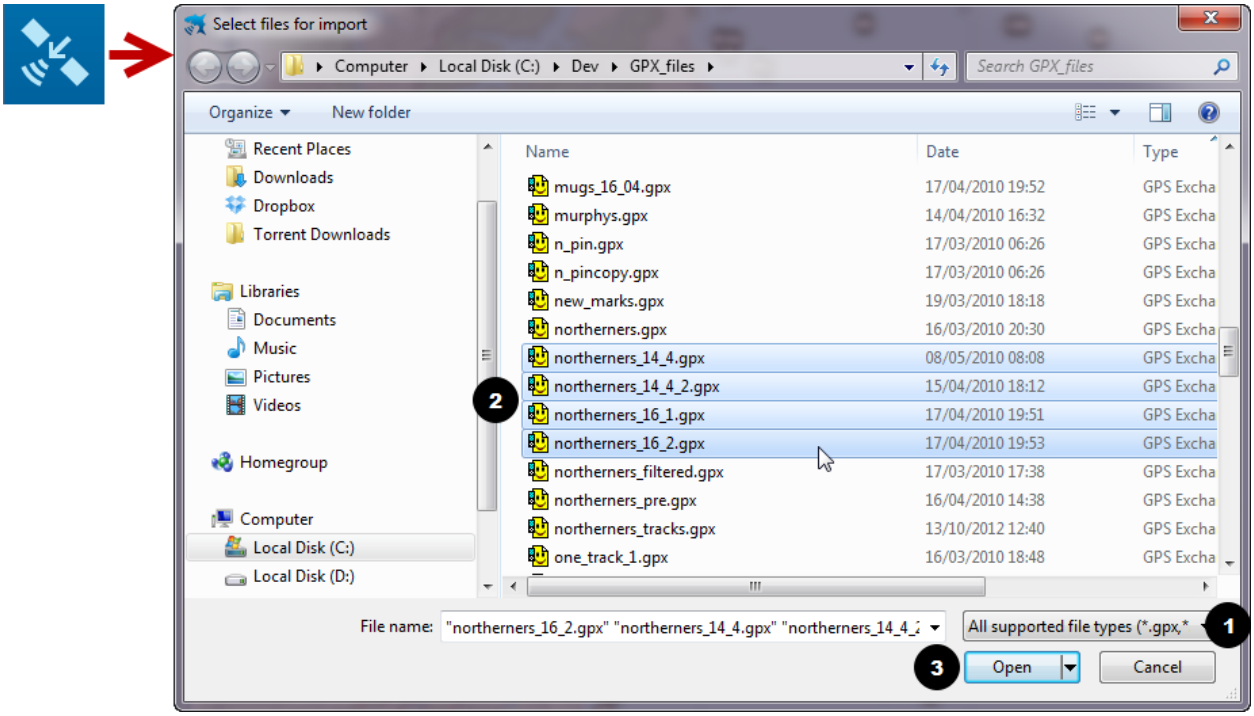
Lowrance™ units can export waypoints and tracks in a *Lowrance*™ proprietry file format with the extension *.USR.* USR files come in several versions; ReefMaster is only able to read versions 2 and 3. Units that write version 4 USR files are usually able to also export in the GPX file format, which should be used in preference.

Tracks within USR files do not contain depth information and so cannot be used for creating maps.

Import GPS Assets

The GPS data import process.

Selecting Files to Import



The import process is started by selecting files to import.

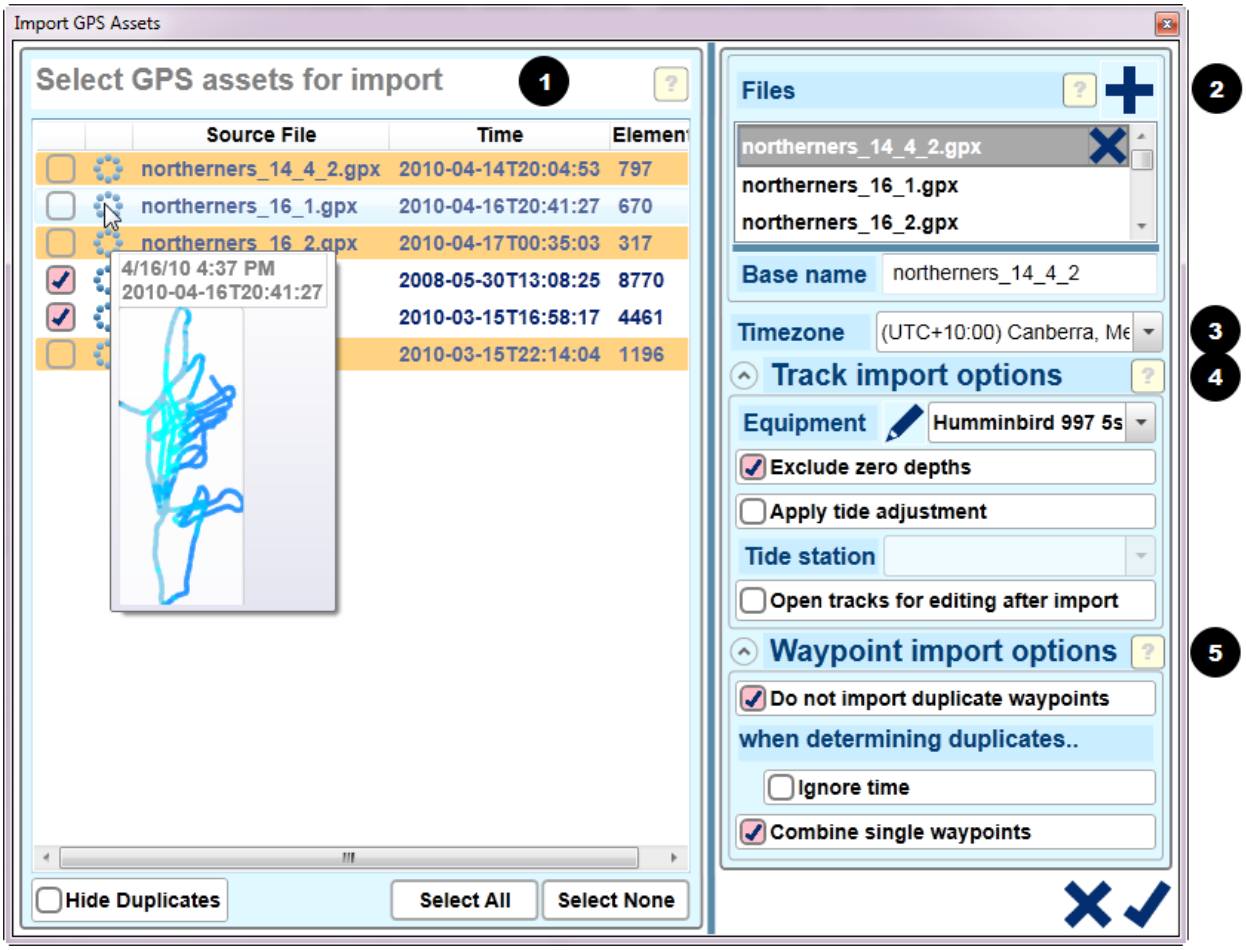
Click the *Import GPS Assets* button in the Main Toolbar. A file selection window is shown.

1. By default, files of all supported file types are shown. To restrict which file types are shown, select the required file type from the file types drop-down list box.

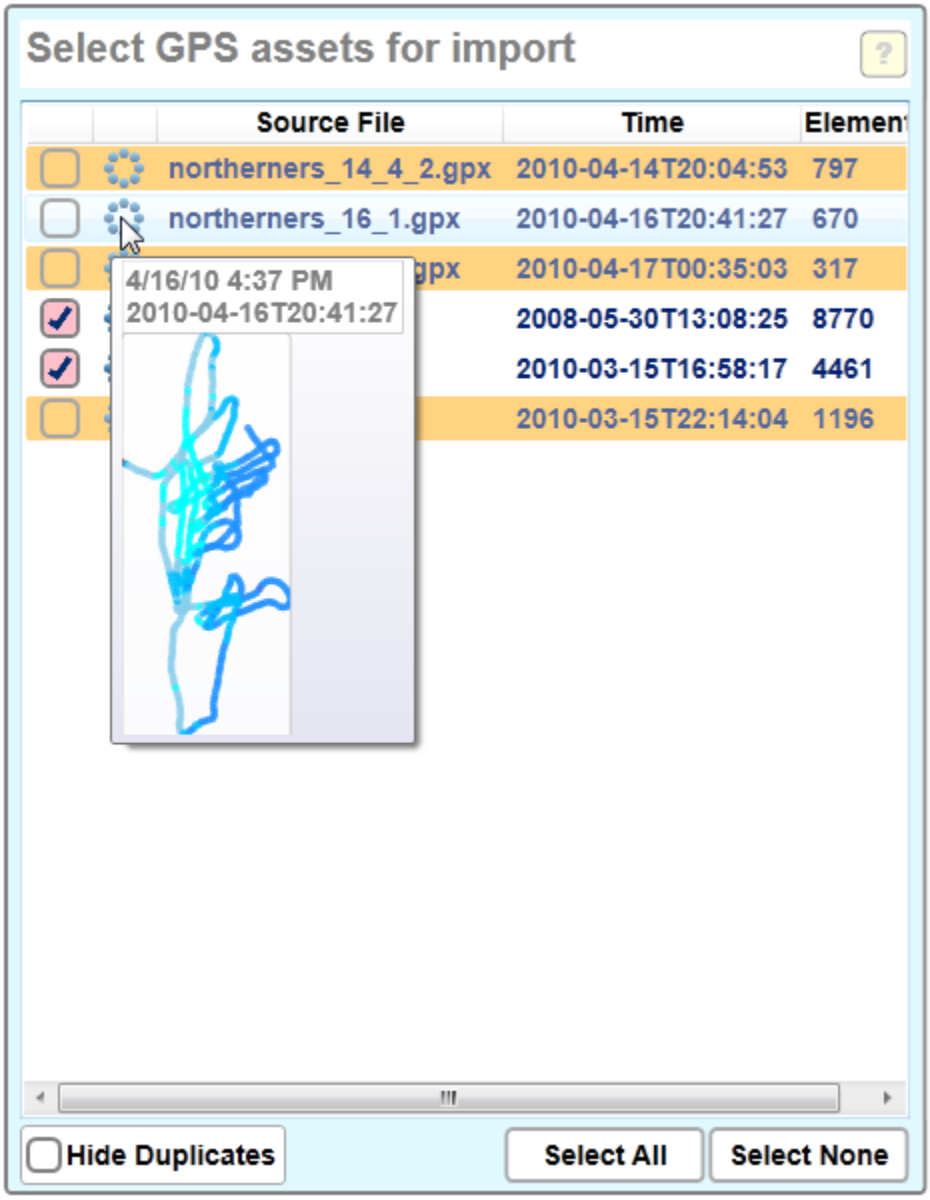
2. Select the files for import. Any number of files can be selected, and the files can be made up of any mix of supported file types.

3. Once the file selection has been made, click the *Open* button or press *Return.* A progress dialog will show whilst the files are process, after which tte *Import GPS Assets Window* will open.

Import GPS Assets



1. Asset List



Select which assets to import from a list of all assets within the selected files.

Waypoint sets and track logs are collectively referred to as GPS assets. Each asset in the selected file(s) is shown as a separate line in the asset list. Use the checkbox to select or de-select an asset for import, or use the ***Select All*** and ***Select None*** buttons underneath the asset list to select or de-select all assets in the list.

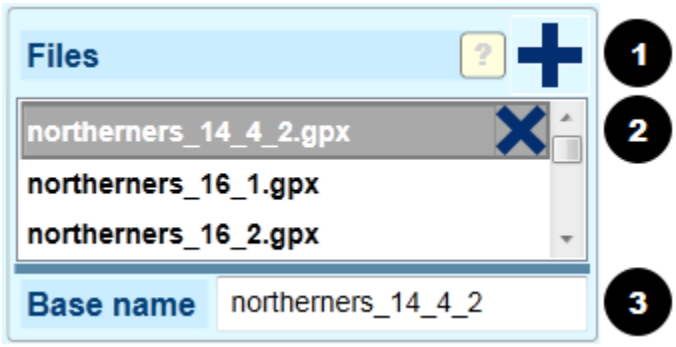
Duplicate status

Assets may be exact or partial duplicates either of other assets within the current import batch, or of assets that have already been imported into the current *ReefMaster* workspace. Partial duplicates are highlighted in orange and exact duplicates in red. A Partial duplicate indicates that some data is shared between assets eg, some track points within a track, or some waypoints within a waypoint set. By default only unique tracks are selected for import. Waypoint sets that are flagged as partial duplicates are selected for import by default, however duplicate waypoints within the set will not be imported unless the *do not import duplicate waypoints* option has been unchecked (see below). Use the ***Hide Duplicates*** button to hide all partial or exact duplicates.

Track preview

Track previews can be seen by holding the mouse pointer over a track icon in the list.

2. Files List



A list of the source data files selected for import.

1. Add further files to the current import using the *Add* button.

2. To remove a file from the import batch, use the *Remove* button at the right of the selected file row.

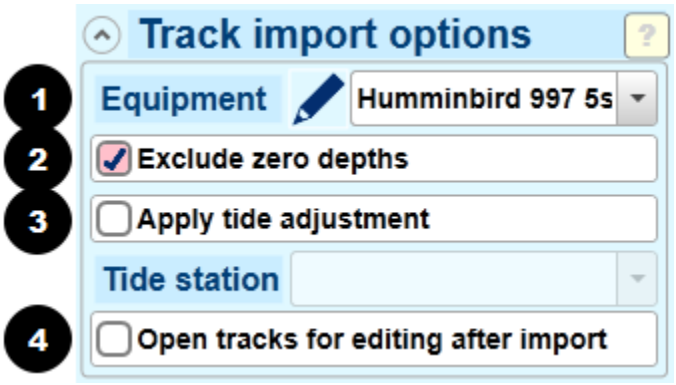
3. **Base Name**

Assets within a file that do not have a name already associated with them are given a name based on the file in which they are contained and the number of assets in the file. To change the base name for assets within a file, modify the *Base Name* field. The base name field can be changed for each selected file.

3. Time Zone

The time zone that will be applied to all of the assets imported as part of this import batch. By default this is the time zone specified in *Global Settings*. The time zone of individual assets can be changed in the appropriate asset edit window post-import.

4. Track Import Options



1. Equipment

Equipment profiles are a way of grouping properties of a GPS device used during the import process. Click *Edit* to add or edit a profile for a GPS device.

The default equipment profile is specified in the Global Settings window.

See *Equipment Profiles* for more information.

2. Exclude zero depths

Check this option to exclude all track points with zero depths on import. This option is useful when the tracks to be imported contain depth information and a zero depth can be considered an error. Note that checking this option when the tracks to be imported do not contain depth data will result in no track points being imported.

Track points with zero depths can also be removed easily after import, by filtering by depth in the *Track Edit Window*.

3. Apply tide adjustment

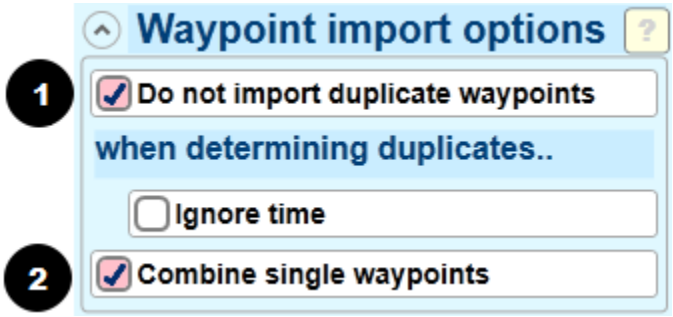
Check this option to assign a tide station to all tracks being imported in this batch. The *Tide Station* can be selected from the drop-down list.

Tide stations can also be assigned in the individual *Track Edit* windows, but checking this option during import saves time when multiple tracks are being imported that share the same tide information.

4. Open tracks for editing after import

Check this option to open all tracks for editing immediately after import. Not recommended when importing a large number of tracks.

5. Waypoint Import Options



1. Do not import duplicate waypoints

By default ReefMaster does not import duplicate waypoints. Duplicates are determined on position and time; name and symbol are not considered. To ignore time when determining whether a waypoint is a duplicate, check the option ***When determinining duplicates..ignore time***.

2. Combine single waypoints

When importing waypoint image snapshots from *Humminbird*™ devices, each waypoint is held in a separate .DAT file. Checking this option combines all such waypoints into a

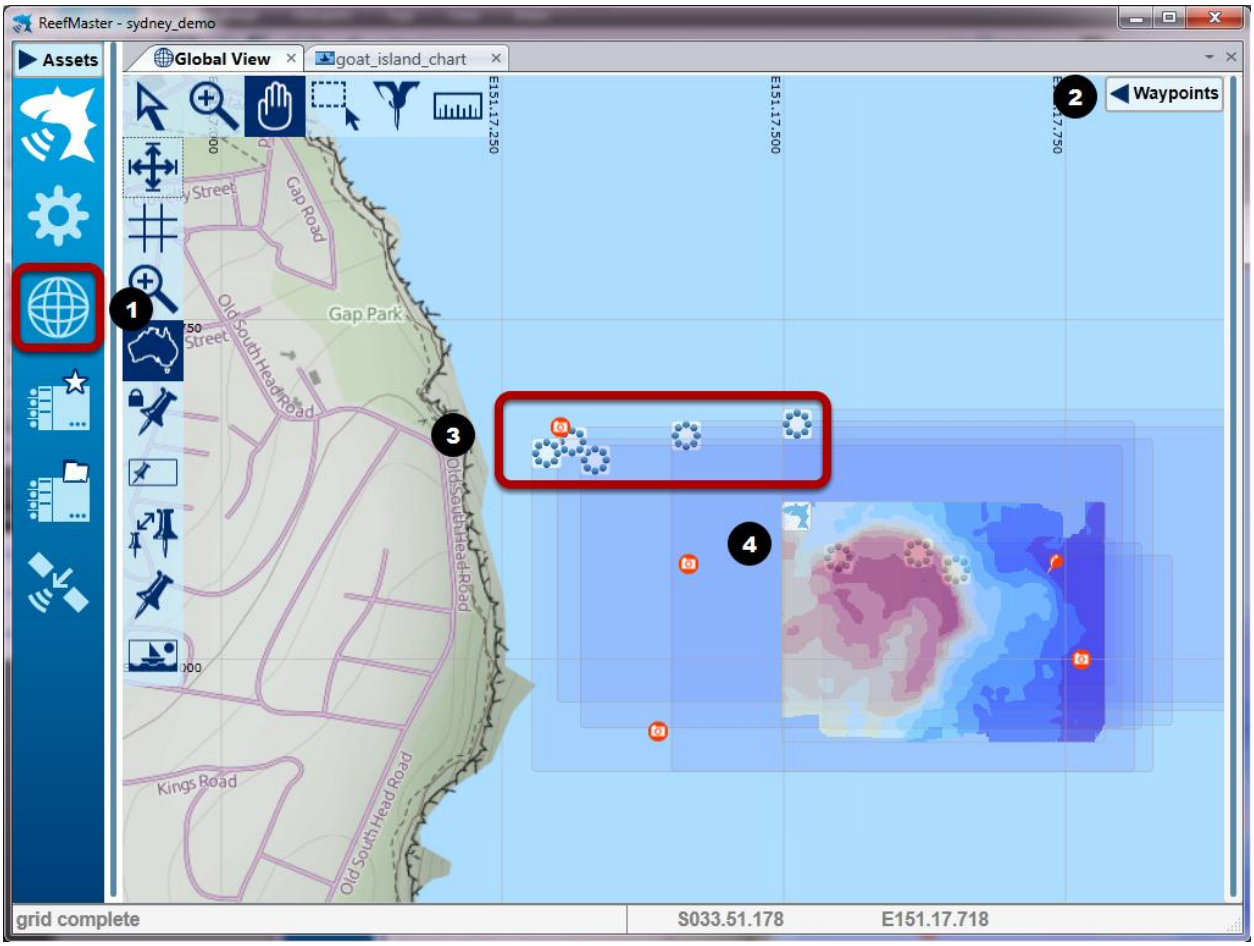
single set after import. The alternative is that each separate waypoint becomes part of a new set.

Assets and Edit Windows

Global View

The Global View is a special edit window that shows all of the assets present in the ReefMaster workspace.

Global View



The *Global View* shows all of the assets in the workspace in a single edit window. The global view provides a view of how assets are situated relative to each other, as well as

a graphical way of selecting assets for editing, and other operations, such as deleting, or exporting to file.

The global view also hosts the Waypoints Edit Pane.

1. Show Global View

The global view is visible by default, shown after creating a new, or loading an existing workspace. If the global view is closed for any reason, it can be displayed again using the *Show Global View* button in the *Main Toolbar*.

2. Waypoints Edit Pane

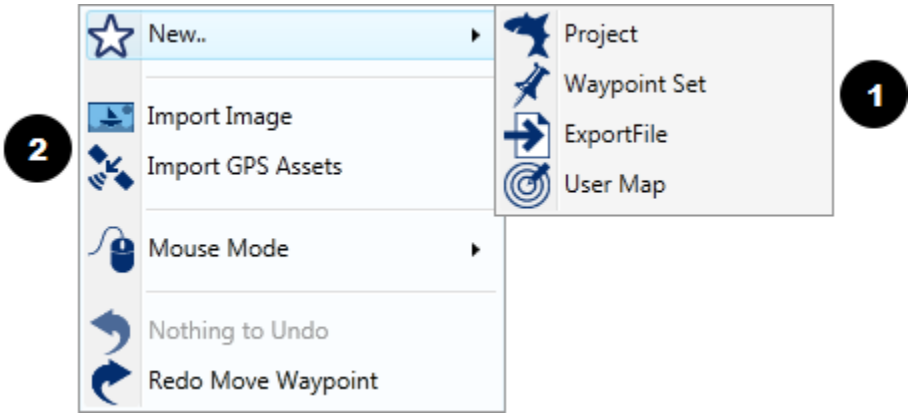
The global view is home to the *Waypoints Edit Pane* which shows the properties the edit controls for waypoint collections. The waypoints edit pane is expanded using the *Waypoints* toggle button.

3, 4. Edit Area

The edit area of the global view is a standard edit window containing all of the assets in the current workspace.

Assets are shown as rectangles describing their geographic extent, with the asset type identified by icons at the top left. **(3)** shows a collection of tracks, identified by the track icons. **(4)** is a project asset, showing a representation of the underwater map.

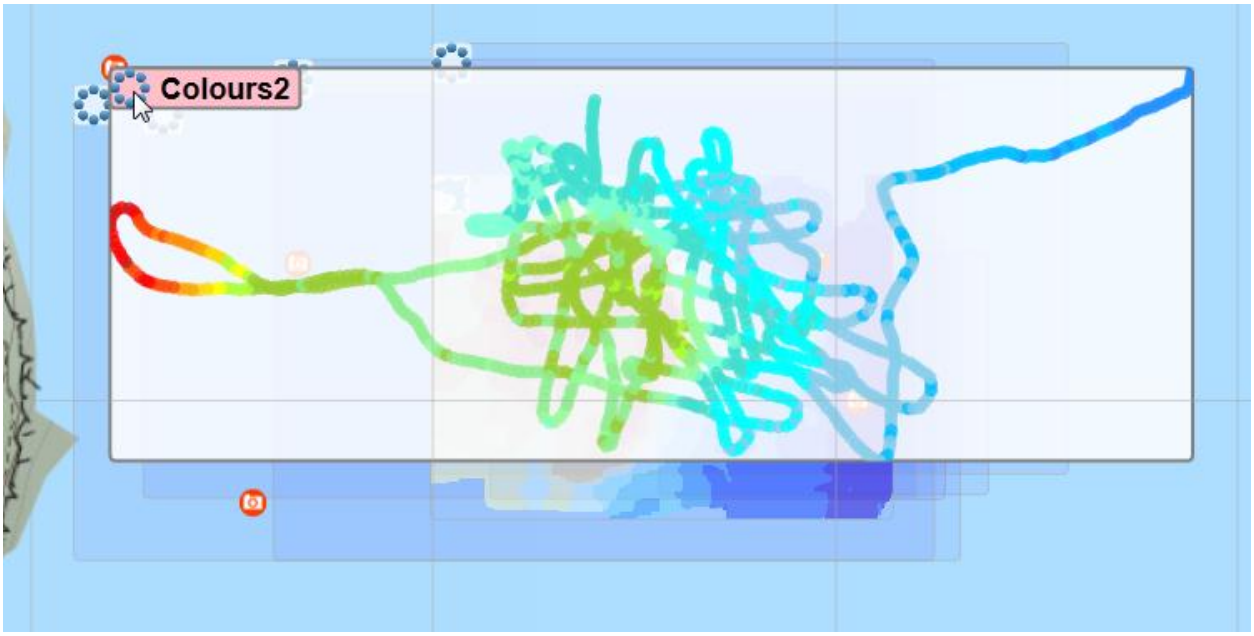
Context Menu



The screen level context menu can be accessed by pressing the right mouse button whilst the mouse pointer is open space - ie, the mouse pointer is not over an asset displayed within the global view.

The global view context menu has options to create new assets **(1)**, import assets or images **(2)** and also the standard edit window functions; mouse mode and undo/redo.

Assets



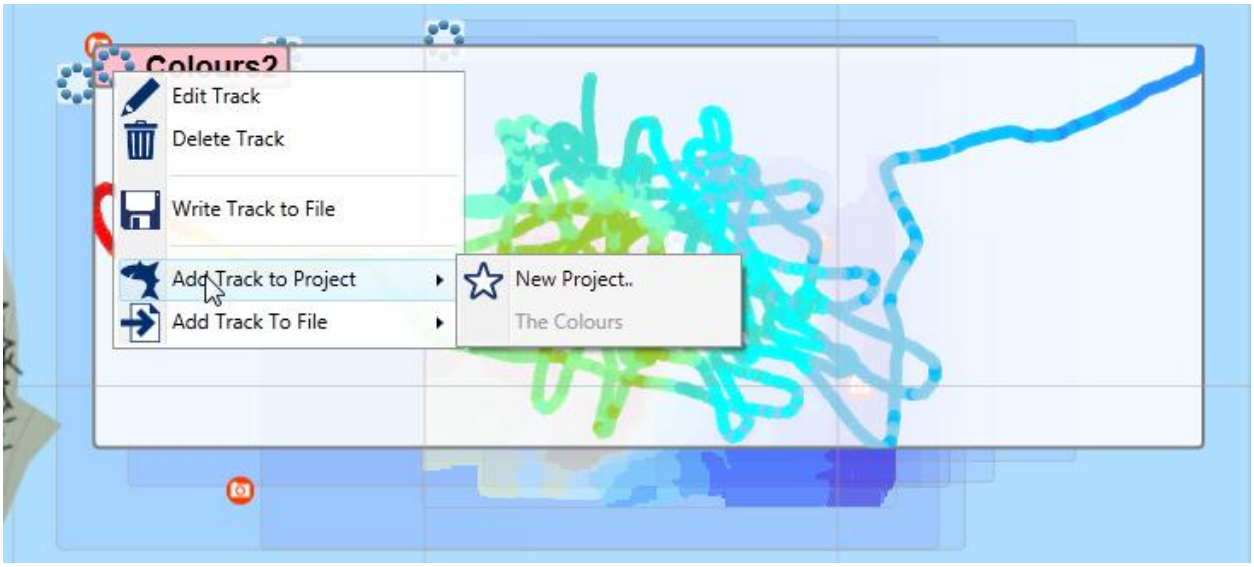
The *Global View* shows all of the assets that are present in the current ReefMaster workspace in one view. This includes waypoints, tracks, projects, user maps and background images. Assets are depicted as rectangles defining their geographic extent, with an icon identifying the type of asset shown at the top left.

Holding the mouse cursor over the icon of an asset shows the name of the asset, and in some cases further information.

Select assets by clicking the asset icon, with the mouse mode set to *select*. In the image above, a track has been selected. Note that the name of the track, *Colours2,* is shown, along with a graphical depiction of the track points.

Assets can be edited by double-clicking on the asset icon with the mouse in *Select* mode. The edit screen appropriate to the asset is opened.

The Asset Context Menu

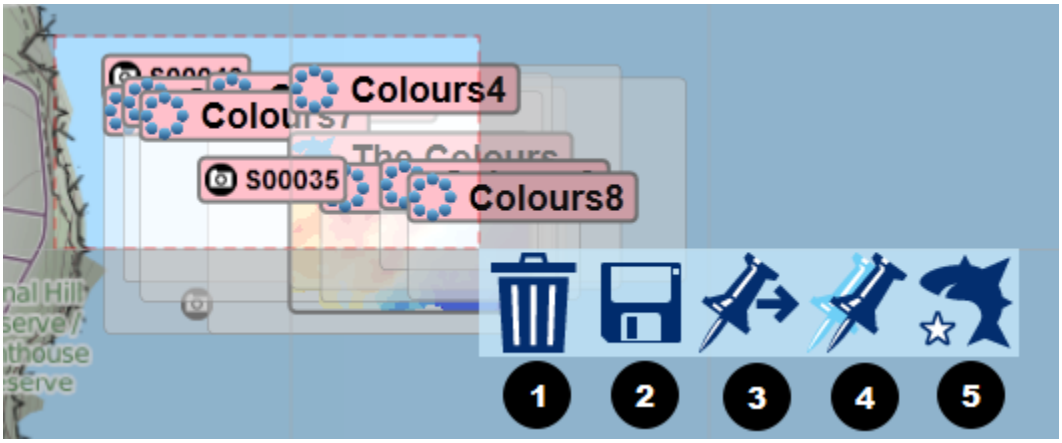


Right-clicking an asset icon shows a range of options including edit, delete and export options, as well as further options specific to the selected asset type.

In the example above, the standard options of *Edit, Delete* and *Write to File* are available, as well as track specific options; *Add Track to Project* and *Add Track to Data Set.*

The asset specific options available in the asset context menus are the same as those in the *Asset Library* and are described in detail in the relevant asset reference pages.

Selecting Multiple Assets



Any number of assets can be selected at once in the global view, either by using the multi select mouse mode and enclosing the required assets in the marquee (the drawn rectangle), or by holding the *control* key down and selecting assets individually, with the mouse in *select* mode. When selecting assets graphically using the marquee tool, the icon area at the top left of the assets needs to be within the drawn rectangle for the asset to become selected.

When the graphical selection of assets using the marquee tool is complete, a toolbar slides out as shown in the image above. The range of operations available in the toolbar depends on the type of assets that have been selected.

Note that all of the options available in the multiple selection toolbar are also available in the context menu, if the right mouse button is pressed whlst holding the mouse pointer over the icon of one of the multi-selected assets.

1. Delete Assets

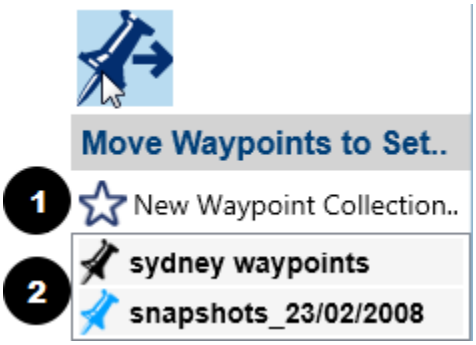
Delete all selected assets. This operation cannot be undone.

A confirmation window is shown listing all of the assets selected for deletion, with a check-box for each asset type. Un-check any asset types that should not be deleted, before confirming deletion using the trash icon. Press cancel to abort the delete.

2. Export to GPS

Export the selected assets to file, for import to a GPS device. Only assets that have been selected are exported; selected waypoints are exported individually without regard to the waypoint set to which they belong. Using the multi-select marquee tool is the simplest way to export a set of assets from a specific geographical area. The Export To GPS window is opened with the selected assets, from where specific assets can be removed from the export process if required.

3. Move Waypoints to Set



Move all selected waypoints to another waypoint set. The selected waypoints will be removed from their current set.

Note that the selected waypoints may currently belong to any number of different sets.

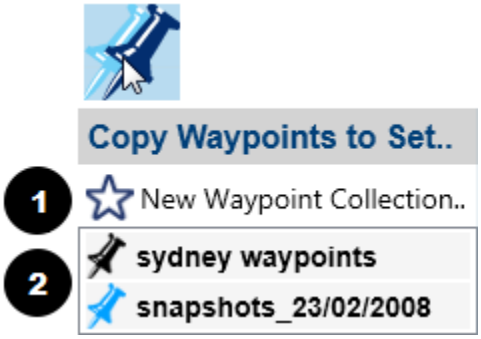
1. New Waypoint Collection

Create a new waypoint collection and move all of the selected waypoints into it. The *New Waypoint Set* window is shown, where a name and colour for the new set can be selected.

2. Existing Waypoint Sets

Choose an existing waypoint set to move the selected waypoints in to.

4. Copy Waypoints to Set



Copy all selected waypoints to another waypoint set. The selected waypoints will be not be removed from their current set.

Note that the selected waypoints may currently belong to any number of different sets.

1. New Waypoint Collection

Create a new waypoint collection and copy all of the selected waypoints into it. The *New Waypoint Set* window is shown, where a name and colour for the new set can be selected.

2. Existing Waypoint Sets

Choose an existing waypoint set to copy the selected waypoints in to.

5. Add Tracks to Project

Add the selected tracks to a map project.

1. New Project

Create a new project and add the selected tracks. The *New Project* window is shown, in which a name for the new project can be entered.

This is an easy and quick way to create a new map project using all of the tracks in one area.

2. Existing Project

Choose an existing project to which the selected tracks should be added. Only projects that are within range - closer to the selected tracks than the maximum map size - are shown. E.g. if a map project is 5km away from the nearest edge of the selected track(s), with a maximum map size of 3km, the project will not be available in the existing proejcts list.

Tracks

Editing of track logs takes place in the track edit window.

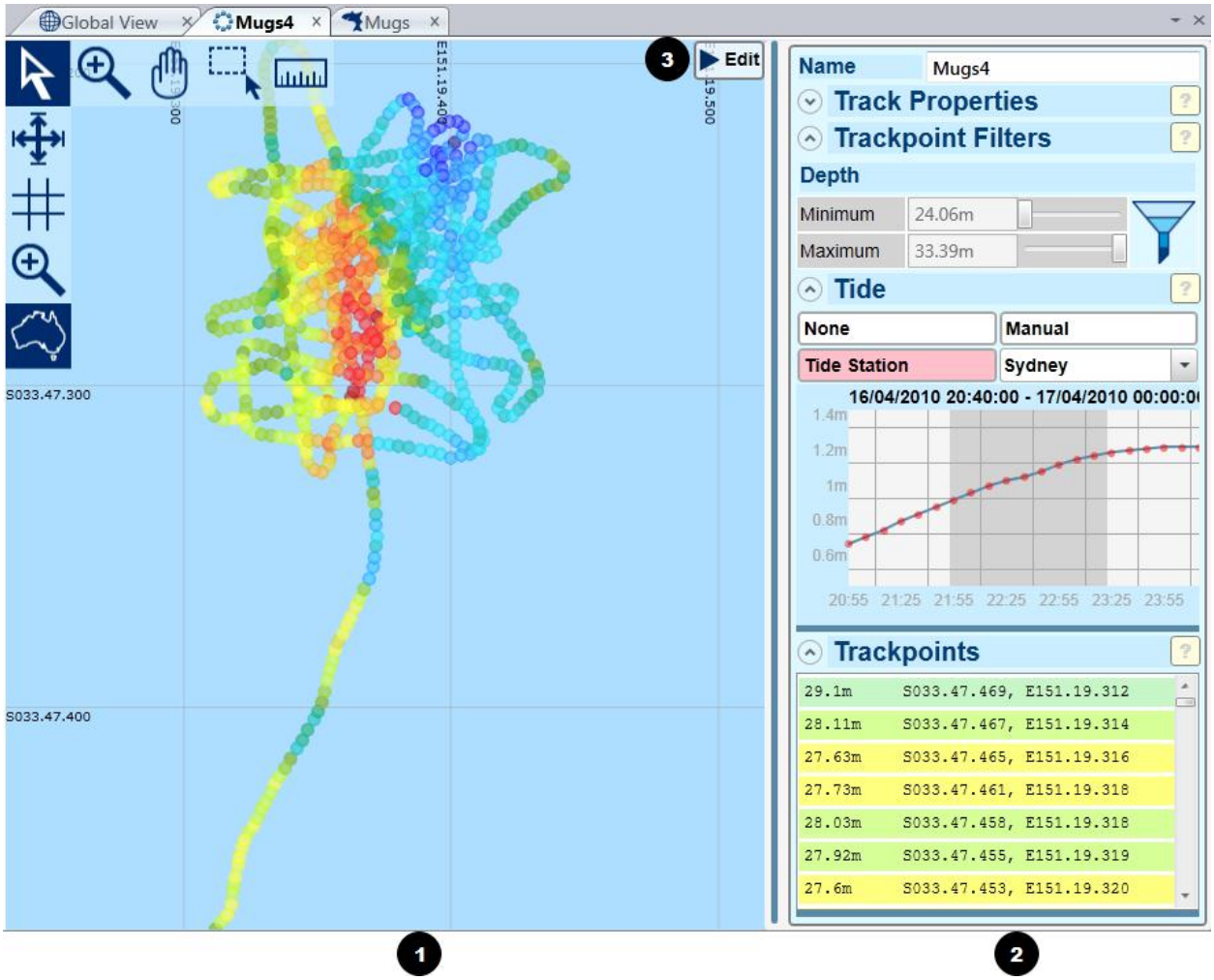
Tracks

Track logs, or trails, saved on a GPS/Sounder device are referred to as *tracks* after being imported into ReefMaster.

Tracks are made up of a number of individual track points, which contain location, depth and time information. Depth and location data from track points is used to generate underwater maps.

Tracks are viewed and edited in the *Track Edit Window*.

The Track Edit Window



To open a track for editing;

- Double click a track or select *Edit* from the context menu of one or more selected tracks in the in the Asset Library **or**
- Double click a track or select *Edit* from the context menu of a selected track in the Global View **or**

- Check the *Open Tracks for Editing After Import* option in the Import GPS Assets window when importing tracks into ReefMaster.

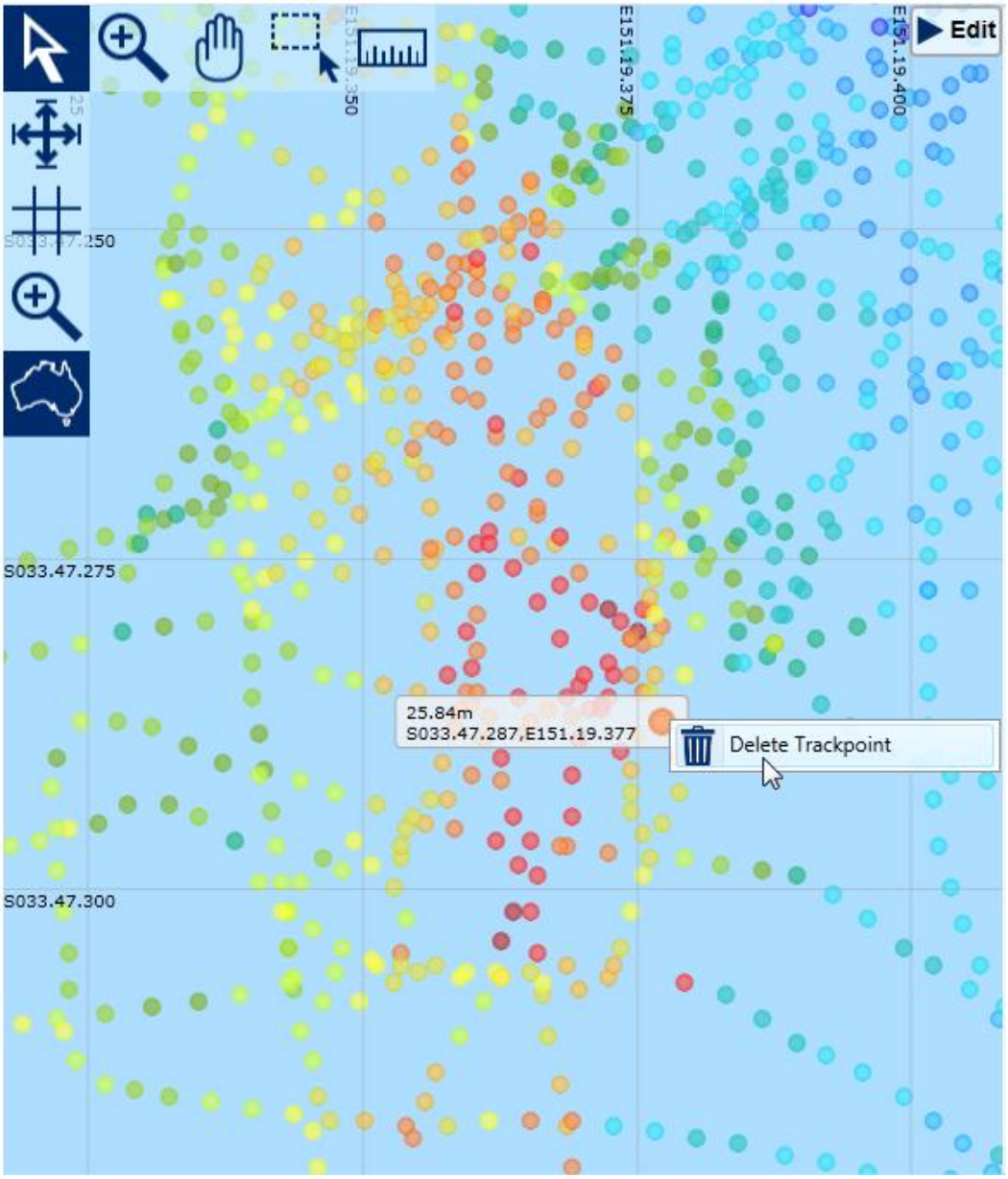
The track edit window consists of;

1. Edit Area, with standard mouse and map control toolbars.

2. Edit Pane**,** with detailed map properties and edit operations, which is shown or hidden using the *Edit* toggle button **(3)**.

See *Edit Windows* for an overview of the edit window layout and standard toolbars.

Track Edit Area



The track edit area shows the track as a collection of individual track points, each depicted as a coloured circle.

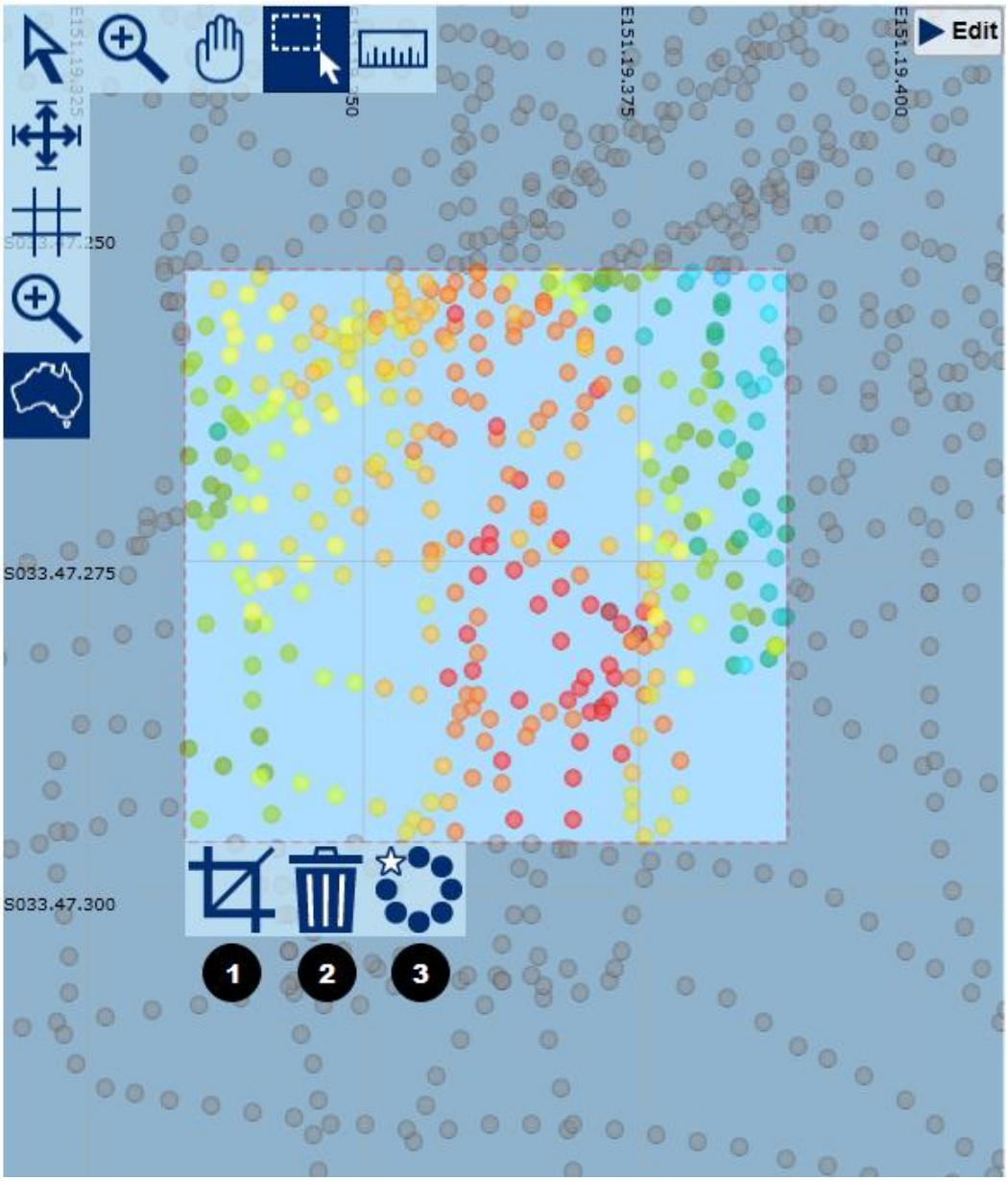
Track point colours

Track points are colour coded to show the relative depth of the track point within the track. Dark blue represents the deepest point of the track, with red the shallowest. As the colour coding is relative, not absolute, the colours of individual track points may change as the maximum and/or minimum depth of the track changes. Relative colour coding of track points makes it easy to see when individual track points have very different depths to their neighbours, which may indicate a bad data point that needs to be removed.

Selecting Individual Track Points

Individual track points can be selected using the left mouse button, with the mouse in *Select* mode. Track points selected in the graphical display area also become selected in the *Track Point List* present in the track edit pane (see below). Indiviudal track points can be deleted through the context menu, activated using the right mouse button.

Cropping and Deleting Track Points



Track points can be multi-selected using the multi-select mouse tool to draw a rectangle around the required track points. Selected trackpoints retain their colours, whilst track points that are not in the selection zone are coloured grey.

Once the selection is complete, a toolbar is shown with buttons for the operations that can be performed on selected track points. These options can also be accessed via a context menu, activated by right-clicking on one of the selected trackpoints.

1. Crop to Range

Delete all track points other than the selected track points.

2. Delete Track Points

Delete all selected track points. This operation is the inverse of the crop command.

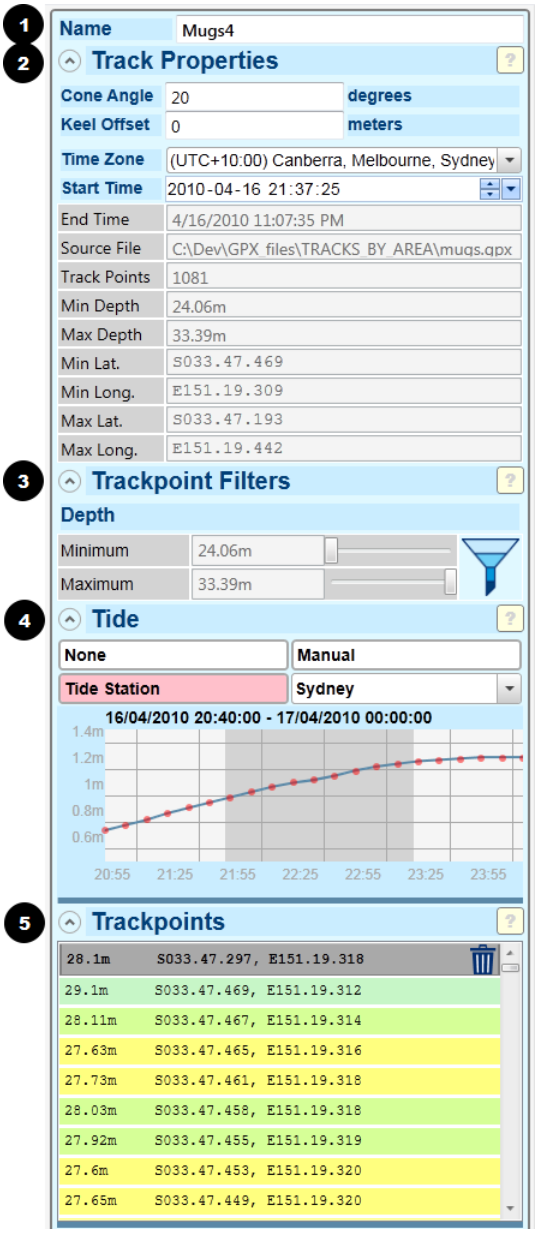
3. Create New Track From Selected Track Points

Create a new track asset using the selected track points. The current track is not modified as part of this operation.

A new asset dialog is shown, where a name for the new track can be entered.

This option is useful when, for example, a single large track covers several different areas of interest for mapping. New tracks can be made by selecting each area in turn, and each new track added to a different map project.

The Track Edit Pane

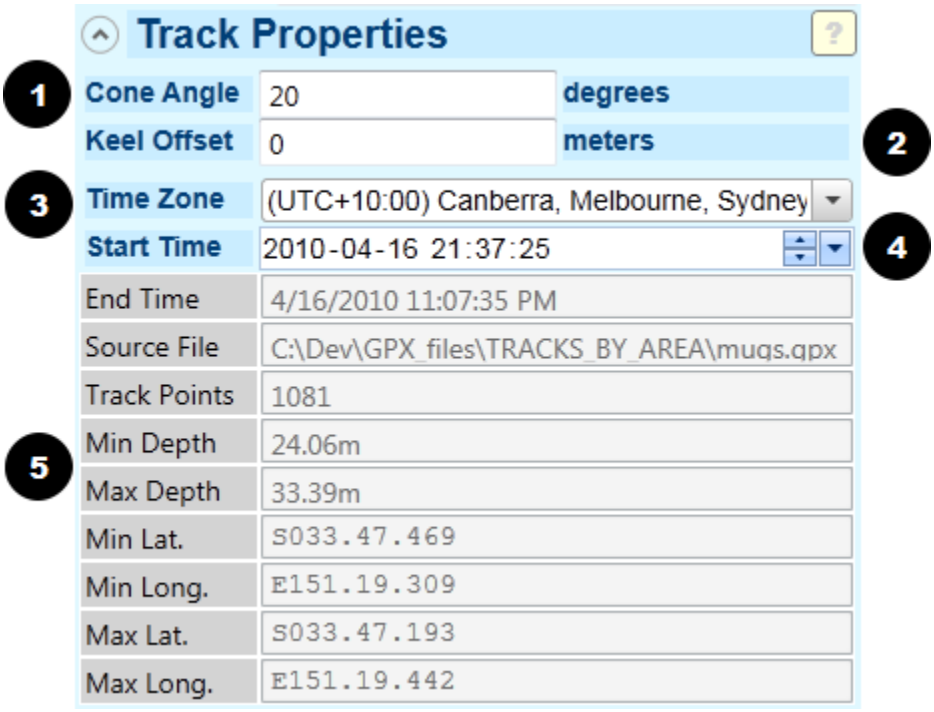


The *Track Edit Pane* provides more detailed information and edit operations for the track.

1. Track Name

The track name can be set here. Asset names can be any string.

2. Track Properties



1. Cone Angle

The angle of the sonar beam from within which the depth is determined.

ReefMaster uses the cone angle when calculating the depths for map generation. Using a cone angle that is approximately the same as the cone angle used to generate the depths in the track is important to maximise the level of detail that can be resolved. Using a larger cone angle in ReefMaster will erode the size of convex features, whilst using too small a cone angle will have the opposite effect.

Use the transducer cone angle specified by the source device as a starting point for this value.

Note, though, that the GPS device may effectively use an angle that is narrower than the stated cone angle when determining depth, so experimenting with smaller values may yield better results.

If the source device is running dual frequencies, use the narrower of the two cone angles.

2. Keel Offset

A fixed depth offset that is applied to all track points in the track.

This depth represents the depth under the water surface of the transducer.

3. Time Zone

The time zone of the track.

Set the time zone associated with the track set using the drop-down list. The time zone only affects how times are displayed, not how they are stored.

4. Start Time

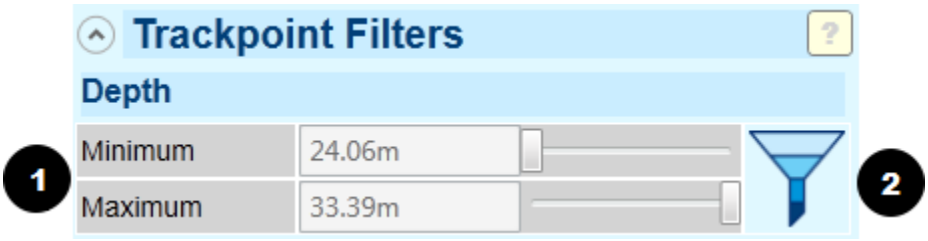
The start time of the track, which is the time of the first track point.

This value is set during import when it is available. If the start time of the track has not been set, or is known to be incorrect, it can be set here. Track points times are represented as time offsets from the beginning of the track, and are important for accurate tide compensation. Changing the start time of the track will update the times of all track points within the track.

5. Track Properties

A selection of read only track properties including depth and geographic range, number of track points and the file from which the track was sourced.

3. Track Point Depth Filter



Track points can be eliminated based on a depth filter, which removes all values lower or higher than specified minimum or maximum values.

Adjust the required minimum and/or maximum values using the sliders **(1)**. The coloration of the track points in the graphical track display adjusts in response. Track points that will be eliminated as a result of the filter operation turn grey. Click the *Apply* button **(2)** to confirm the filter operation.

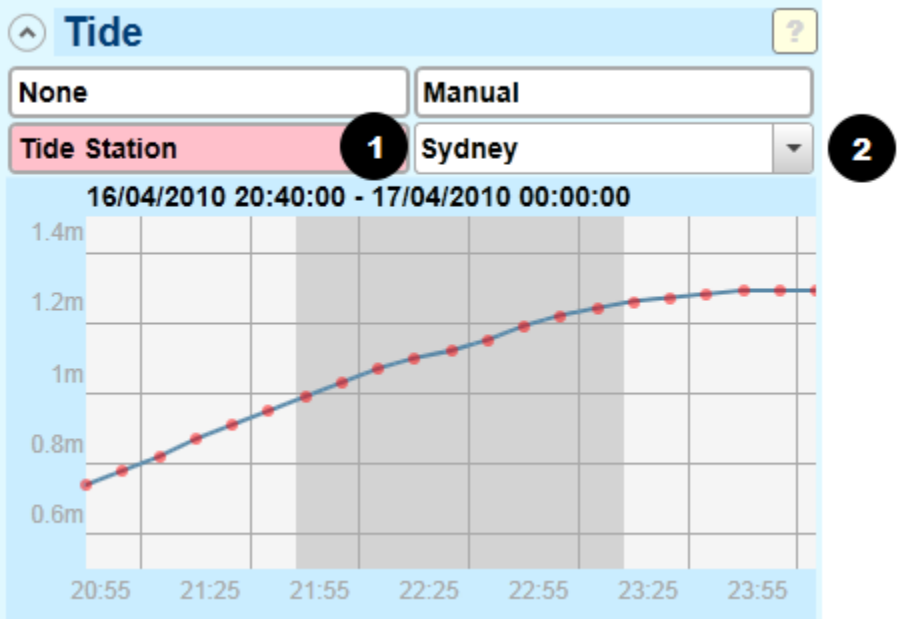
4. Tide

Adjust track point depths according to the state of tide or water level

When making maps from data gathered in tidal waters or over multiple trips from lakes at varying water levels, it is important to adjust the track point depths to compensate.

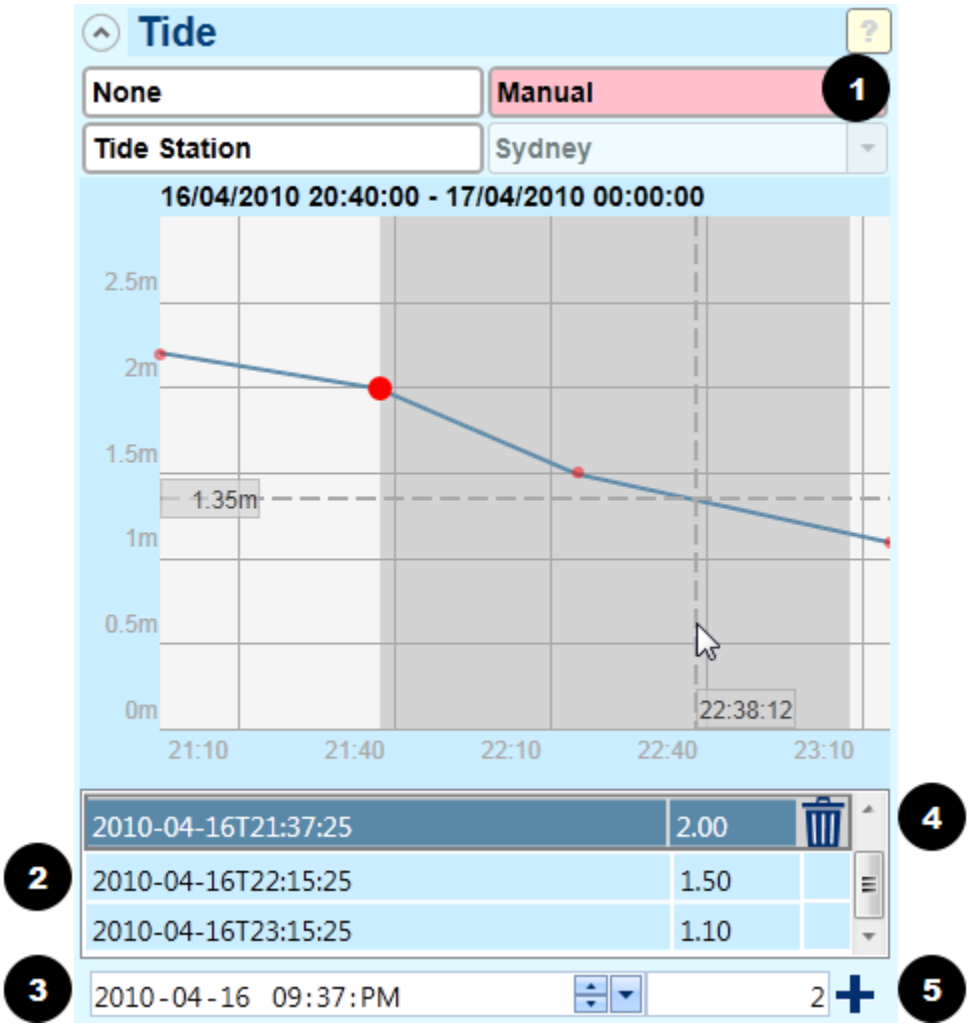
Water level adjustments can be made either manually, or by using an existing *Tide Station*.

Tide Adjustment Using a Tide Station



If a *Tide Station* has been set up for the track area (see *Tide Stations*), select the option *Tide Station* **(1)** and then select the appropriate tide station from the drop down list **(2)**. The tide values are shown in the graph area, with the time period of the track shaded grey.

Manual Tide Adjustment



Select the *Manual* option **(1)**. A graph area is shown, with the time of the track highlighted in grey.

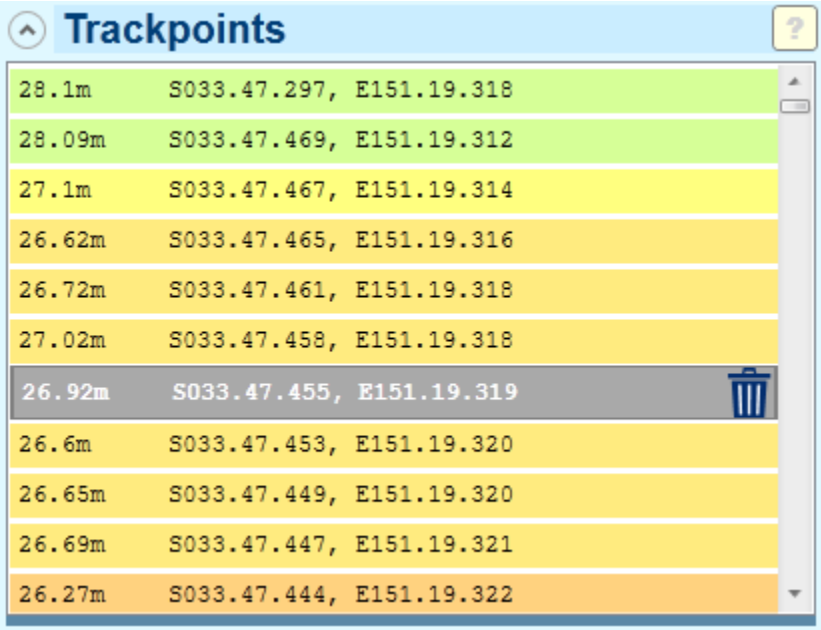
Depth offset values are entered using the edit area **(3)** at the bottom of the tide information panel. A time and depth a required for each offset. Offsets are added using the *Add* button **(5).**

Depth offsets are calculated between the points added using simple linear interpolation. **If only a single point is added, then this value is used as the depth offset for all depth points.** This can be useful, for example, when entering lake levels, which may vary from track to track but remain static for the duration of a track.

Once a depth point has been entered, it appears in the deph point list **(2).** A depth point may be deleted using the *Delete* button **(4).**

To update the depth of an existing depth point, select the depth point and modify the depth in the edit area. Press the *Add button* to commit the change.

5. Track Point List



A list of all track points in chronological order, showing depth and position.

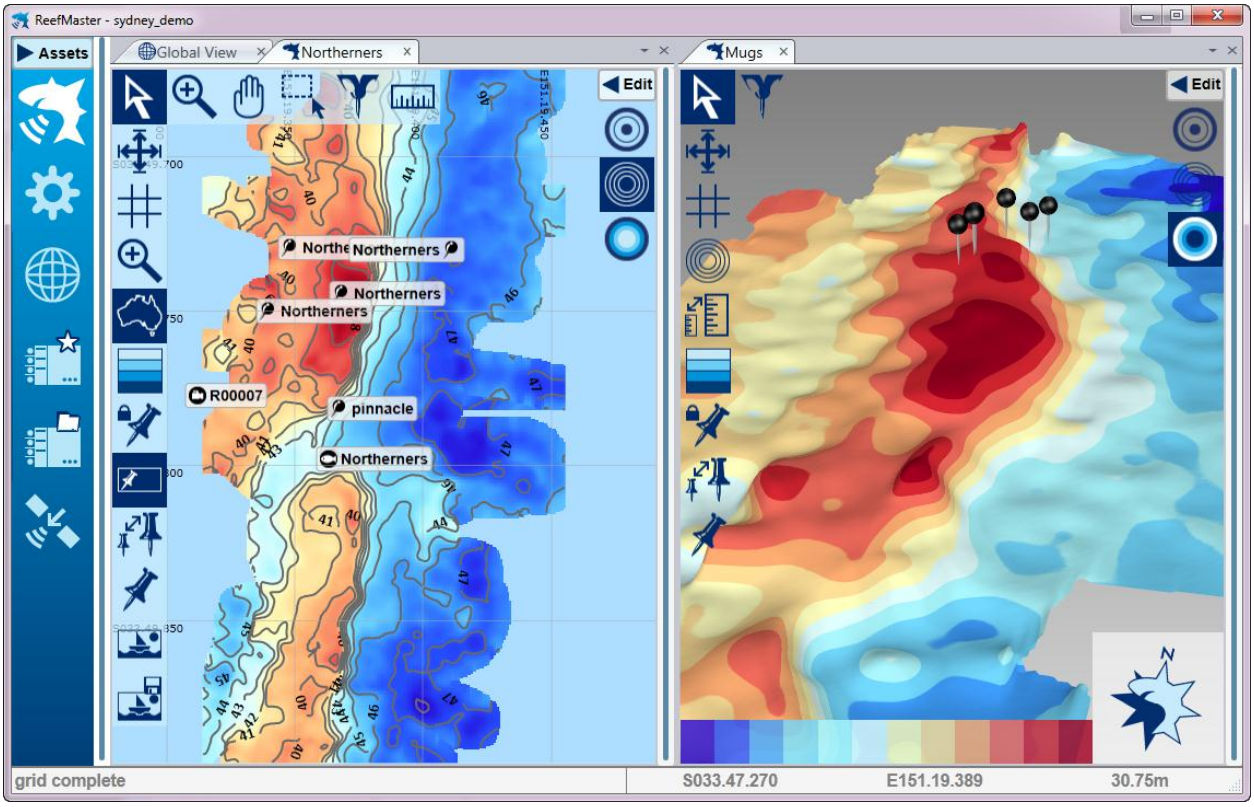
Individual track points can be deleted using the *Delete* button.

Selected track points are synchronised with the track point display in the graphical edit area.

Map Projects

Underwater maps created using the data from one or more tracks.

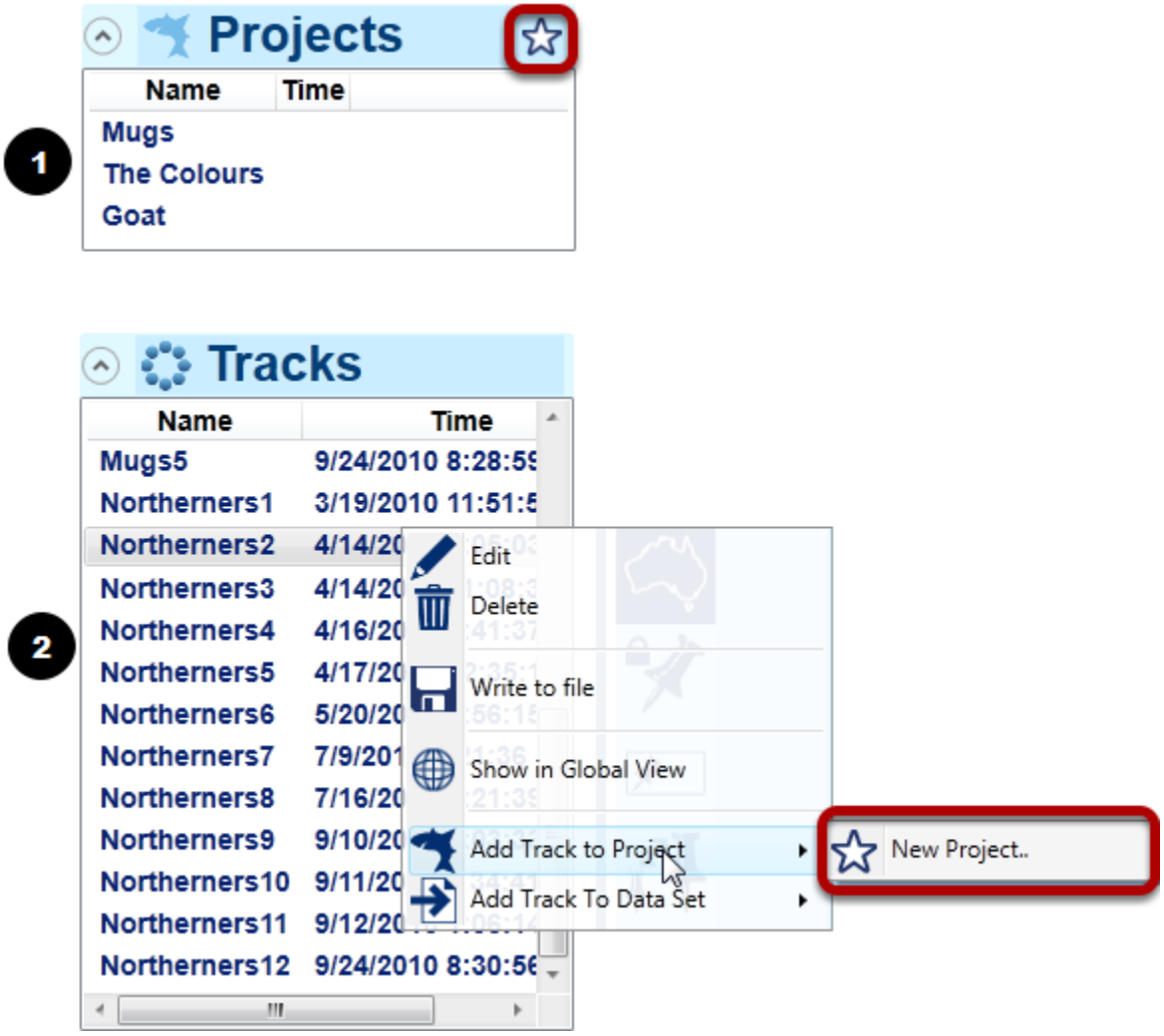
The Map Project



Map projects are underwater maps generated using the data from track logs.

The image above shows two different map projects, showing both the contour and three dimensional views.

Creating a New Map Project From the Asset Library



1. New Project Button

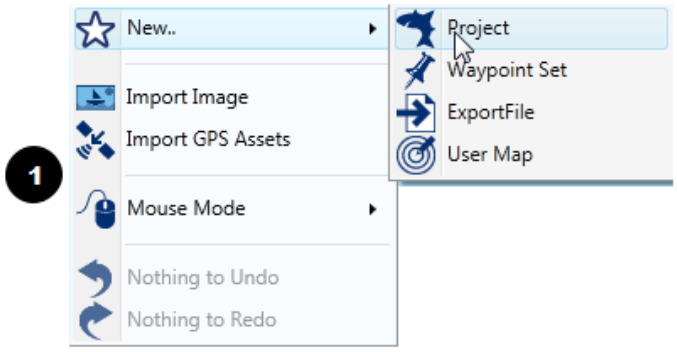
An empty new project can be created using the *New Asset* button in the header of the projects list in the Asset Library.

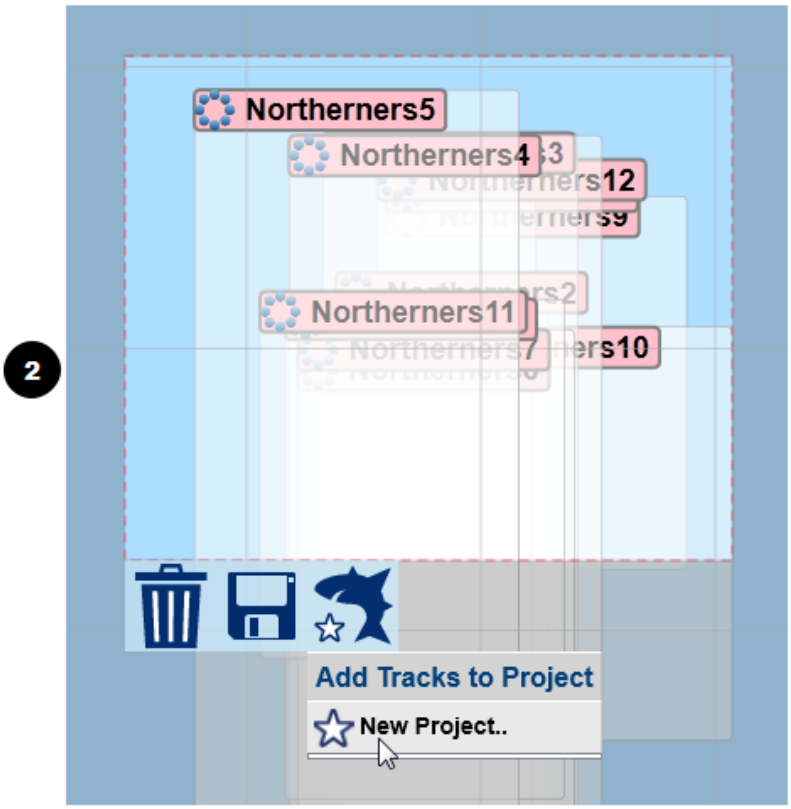
2. The Track Context Menu

Select one or more tracks in the *Tracks asset* list and right click to display the context menu. Select the option *Add Track to Project/New Project*. If other projects exist within

range of the selected track, they will also be listed under the *New Project* option, and the track(s) can be added to one of those projects. Projects of which the track is already a member are shown as disabled menu options.

Creating a New Map Project from the Global View





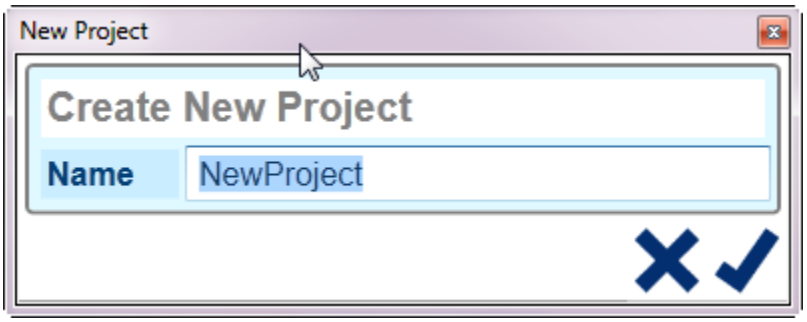
1. Context Menu

An empty project can be created using the context menu in the Global View.

2. Selected Track(s)

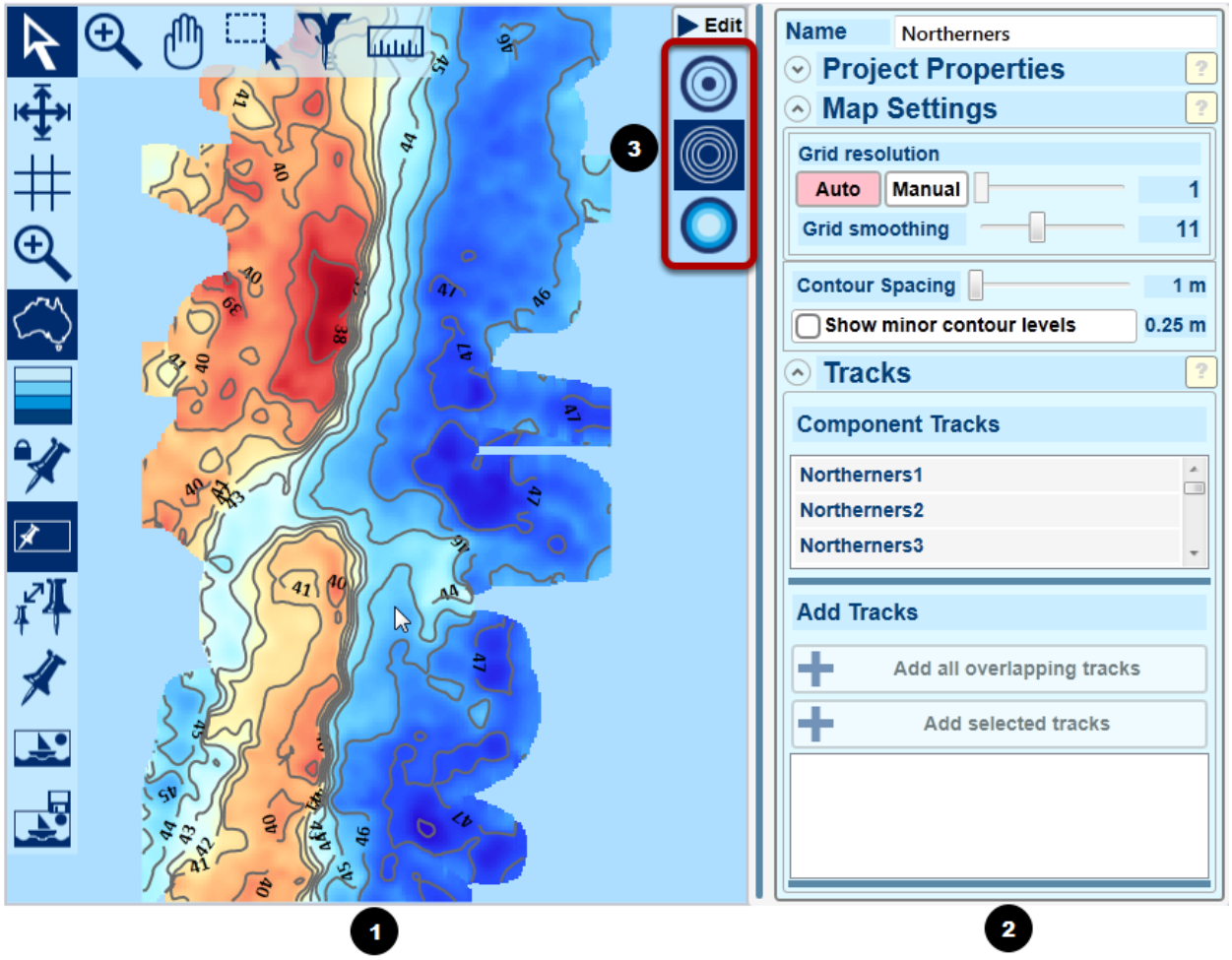
When one or more tracks are selected using the mouse in *multi-select* mode, the *Add Tracks to Project* button is shown on the multi-select toolbar. To create a new project, select *New Project.* A new map project is created containing the selected tracks.

New Project Window



Whichever method is used to create the new project, the *New Project* window is shown. A name can be entered for the project, and the project is created once the *OK* button is pressed.

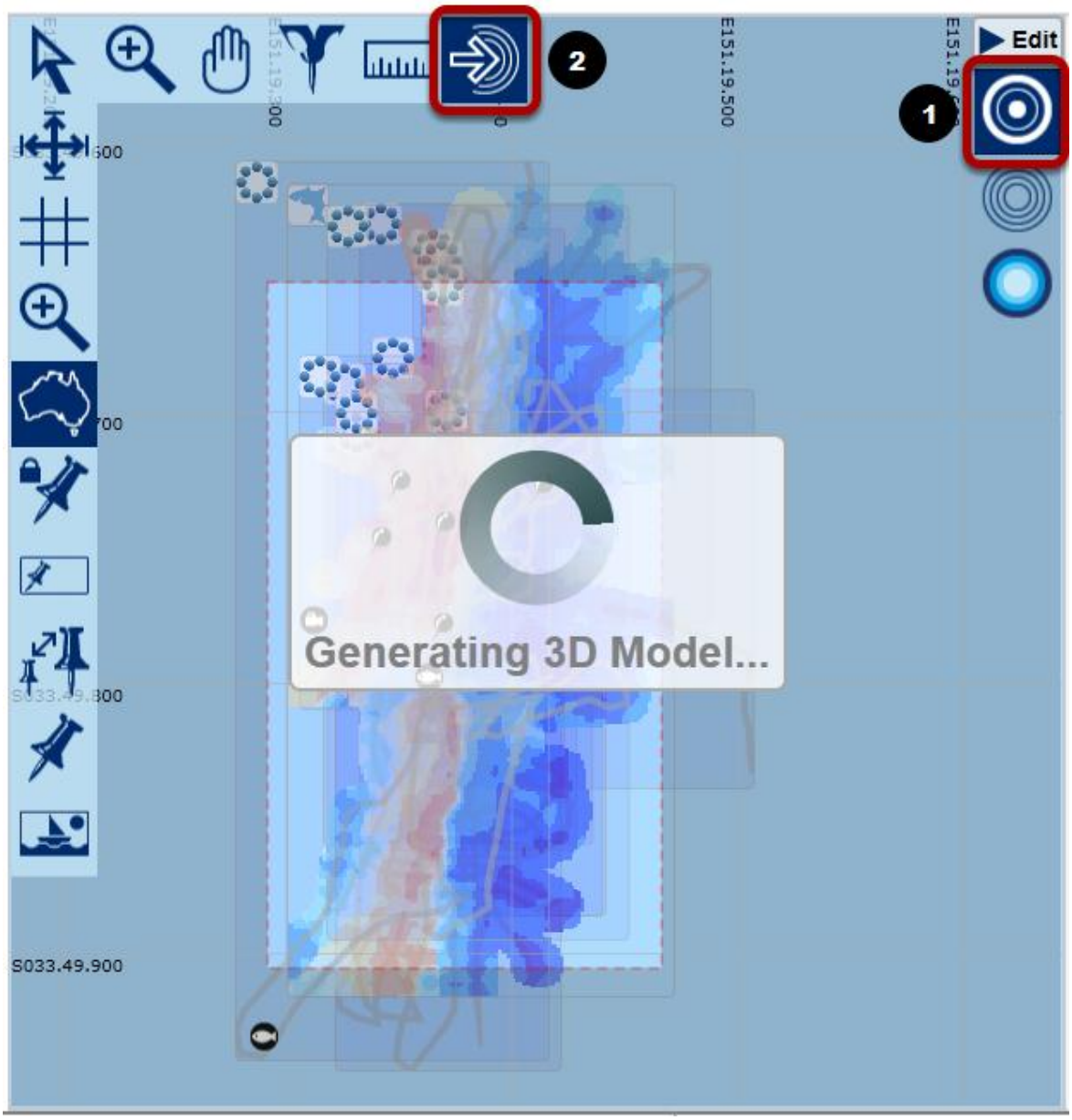
The Project Edit Window



The project edit window has a standard Edit Window layout, with a graphical edit area **(1)** and an expandable edit pane **(2)** with detailed editing options and properties display.

The graphical edit area of the project window can be switched between three separate *views* of the project; *Define Map Area, Contour View* and *3D View.* Switch between the three display modes using the toolbar on the right side of the graphical display **(3)**.

Define Map Area View



The *Define Map Area* view is one of three views available in the edit area of the project edit window, selected using the top-most of the view icons **(1)**.

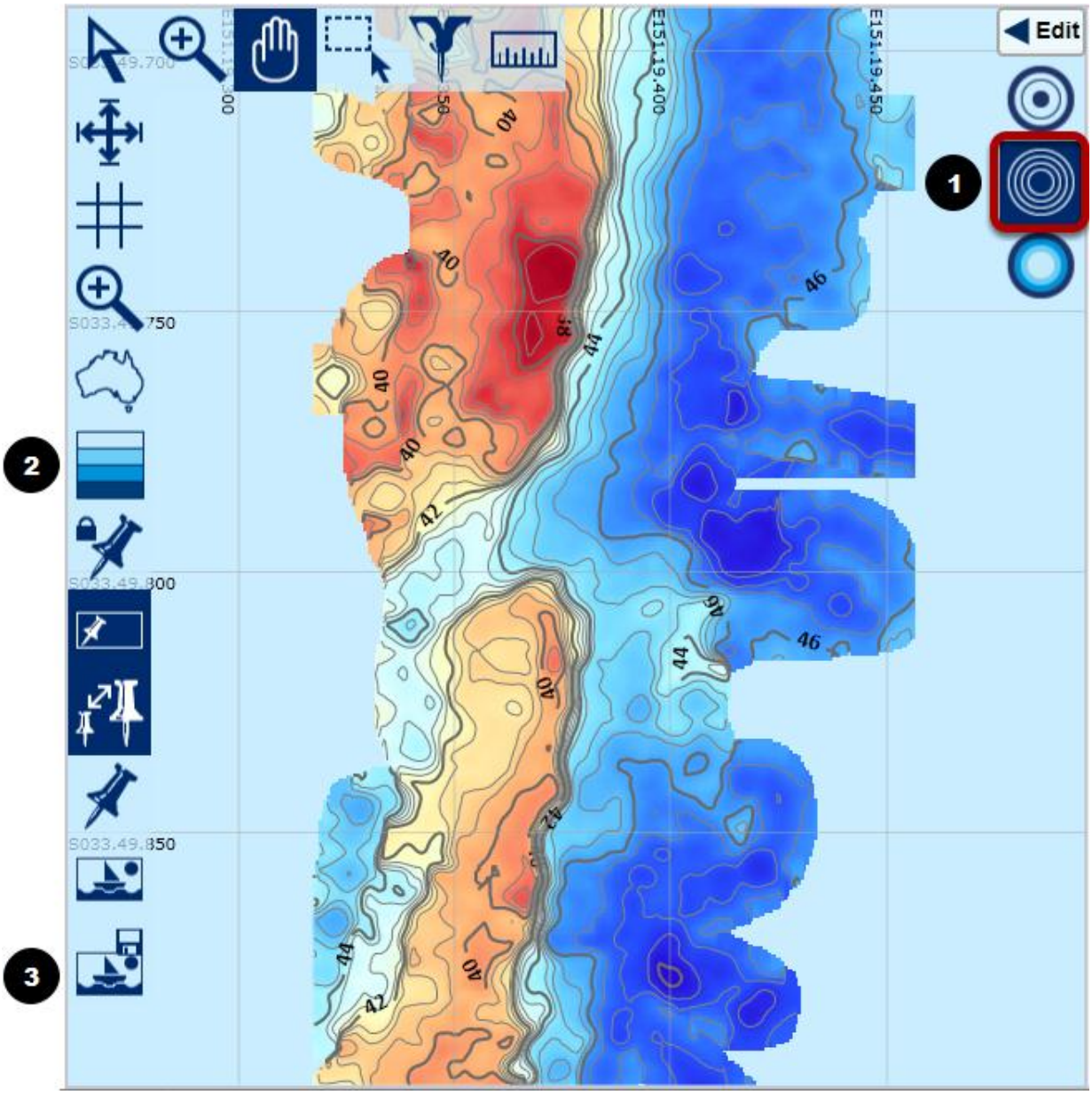
The function of the *Define Map Area* is to specify the area of the generated map, which will be generated using trackpoints within the defined area. *Define Map Area* is the default view when no map area has been defined - for example, when the project has just been created.

- To define the map area, put the mouse into *Define Map Area* mode **(2)** and, with the left mouse button held down, draw a rectangle around the required region. The tracks that make up the map data are overlaid as simple trails, which assists in locating the areas with the highest concentration of data.
- Once the area has been drawn, and the mouse button released, a progress indicator is shown and the model is generated. Once the model has been generated, a colour-coded grid of the mapped area is displayed.

Maps are generated using the track points within the defined map rectangle. A limited amount of interpolation is performed when values are present on all sides of an empty data cell. Otherwise, empty values are left as transparent within the map rectangle.

It is possible to continue using ReefMaster whilst the map is being generated, as map generation is executed as a background task. The map is automatically re-regenerated any time that the data used by the map is changed. For example, if a track is added or removed to the map, or if any values within a component track are changed.

Contour View



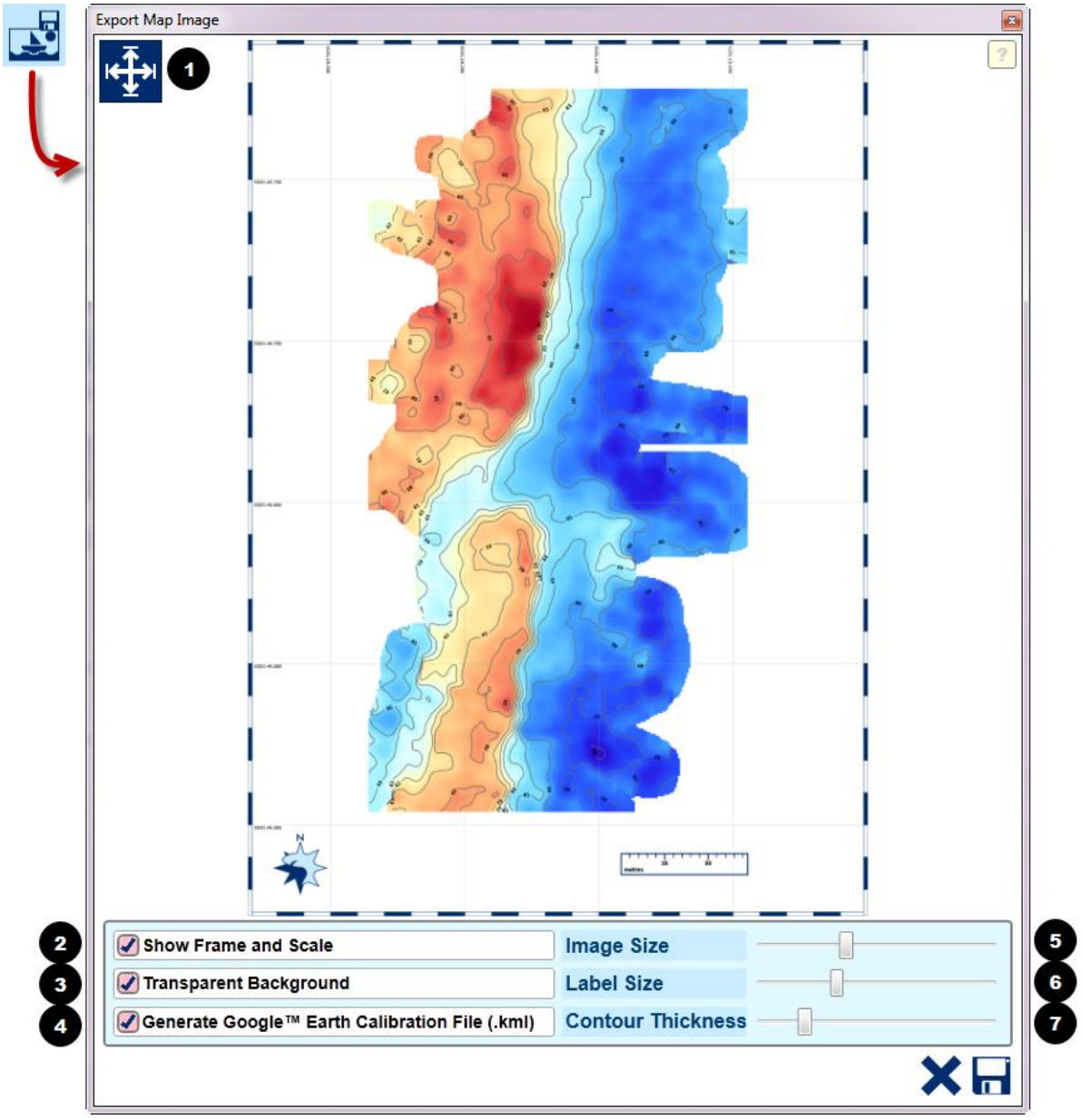
The *Contour* view is selected using the middle of the view icons **(1)**. The contour view is the default view when a map area has been defined (using the *Define Map Area* view, above). No map is shown in the contour view if no map area has been defined.

- The *Contour View* represents the underwater map as contour lines shown on a background coloured by depth. The background palette can be changed using the *palette selector* **(2).**
- Contour level depth increments and the visiblity of minor contour lines can be set in the *Project Edit Pane (*see below).
- Contour lines can be selected, either individually or using the multi-select tool, and added to a *User Map* for export to a GPS device (see *Selecting Contours for User Maps,* below).
- Contour maps can be saved as an image file using the *Export Map Image* button*,* **(3)** (see *Export Map Image*, below).

Palette Selector

The *Palette Selector* contains a list of palettes for the contour map background image, which is colour-coded by depth. There are options for a plain, light coloured **(1)**, or a transparent background **(2)** which can be useful for printing or overlaying on images in other applications.

Export Map Image



The contour map can be saved to disk as an image file, from where it can be printed, used in other applications, posted on the internet etc.

To export a map image, use the *Export Map Image* button in the contour view toolbar.

The basic appearance of the export image - for example, grid lines and the background palette - are taken from the current state of the contour view. To produce an export image without grid lines, for example, remove the grid lines in the contour view before selecting *Export Map Image*.

After selecting *Export Map Image*, a new window is shown containing a preview of the export image and some further image options.

The preview image can be shown full size, or scaled to fit the preview window. Use the *Fit Window* button **(1)** to toggle between the two modes.

Image Options

2. Show Frame and Scale

Adds a frame to the image, and insets the map within the frame. This option is useful when creating a map image for printing. The frame is proportioned to fit standard printing paper, either portrait or landscape depending on the relative proportions of the map image. A distance scale and compass rose are also shown. If the frame and scale option are unchecked, the export image dimensions match those of the map area rectangle. This option is useful for creating image overlays for other mapping applications, e.g. *Google Earth*™.

3. Transparent Background

When checked, white space background is output as transparent in the image file. This is useful when creating image overlays for other mapping applications. If the options is unchecked, the background is rendered in solid white.

4. Generate Google Earth™ Calibration File

Create a .kml file containing information about the geographic extent of the map image, that can be read by the *Google Earth*™ mapping application. When a.kml file is opened

in *Google Earth*™, the associated map image will be overlaid in the correct location on the *Google Earth*™ map. The .kml file is an additional file to the generated image file, and both must be present in the same disk location for use by Google Earth™.

5. Image Size

Image size in pixels per metre.

Use the slider to adjust the final image size, in the range 2 10 pixels per meter. Note that for large maps, this can result in very large image sizes and a large memory requirement whilst rendering the image.

6. Label Size

Use the slider to adjust the relative size of the grid, depth and waypoint labels.

7. Contour Thickness

Use the slider to adjust the relative thickness of the contour bands.

Selecting Contours for User Maps

To be exported to a GPS device, contours must first be added to a *User Map.*

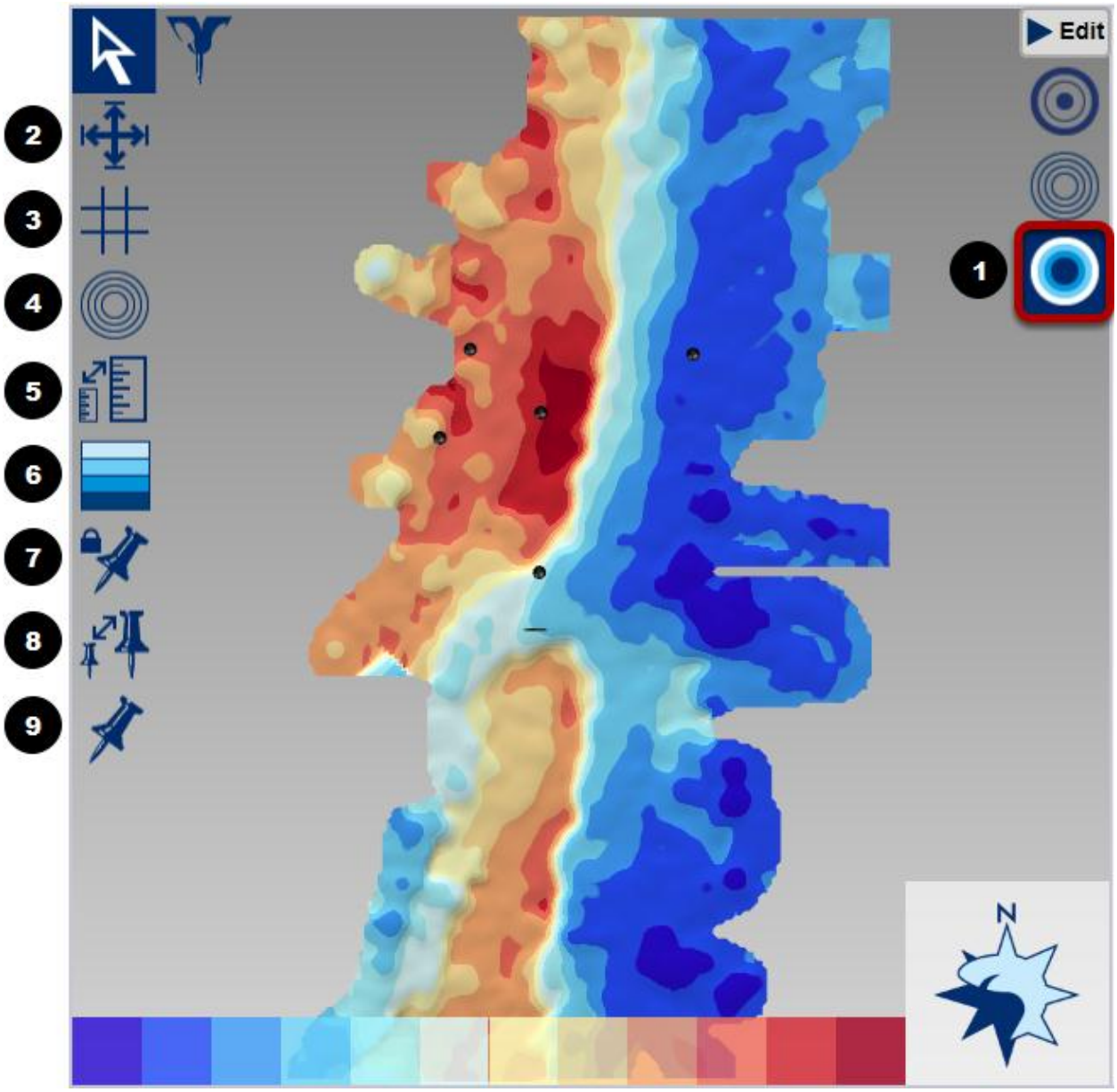
To add contour lines to a map, select the required contours using either the multi-select tool or the select tool in conjunction with the *control* key. Once the required contours have been selected, they are added to a user map using the context menu *Add*

Contours to Map option. A new map can be created, or the contours can be added to an existing map. If a new map is created, it is opened for editing once the contours have been added.

Hints for creating contour lines for export

- Experiment with the map smoothing before choosing contours for export - smoother, less detailed contours produce less clutter and are easier to read on most GPS chartplotter screens.
- Experiment with the contour depth intervals. Some contour intervals may define certain features better than others.
- Select only the contours required to define the area of interest.

3D View



The 3D view is selected using the bottom of the three view icons **(1)**.

No map is shown in the 3D view if no map area has been defined (see *Define Map Area* view, above).

The 3D view shows the map as a 3D model that can be zoomed and rotated with the mouse.

The map can be zoomed by using the mouse-wheel, and rotated by dragging the model with the left mouse button held down, when the mouse is in *select* mode.

Waypoints are shown on the map in 3D, and can be opened for editing (by double-clicking) or operated on through the context menu (right mouse button), just as in the 2D views. Waypoints, when unlocked, can also be dragged around the map surface. With the mouse in *Drop Pin* mode, new waypoints can be created on the map.

3D View Toolbar

2. Fit Window

Reset the rotation of map, and zoom the map to fit the available window space.

3. Show Grid

Show grid lines. Grid lines are shown as dashed lines layed on top of the map in 3D. The grid line density cannot be changed in the 3D view.

4. Show Contours

Show contour lines. Contour lines are shown as solid lines, superimposed on the map in 3D. Only major contour lines are shown in the 3D view.

5. Vertical Scale

Modify the vertical scale of the map. The vertical scale can be modified in the range 0 - 5x, whilst maintaining a constant scale along the longitude and latitude axes. Increasing the vertical scale greatly exagerates the appearance of depth changes, which can be

help visualise changes in depth, especially in larger maps with a relatively small depth variation.

6. Palette

Change the palette. Two versions of each palette are given, one provides sharp edges between each colour change and the other has a smooth gradation. The latter palettes work well with the contour overlay.

7. Lock or Unlock Waypoints

Lock or unlock waypoints. Waypoints need to be unlocked before they can be dragged with the mouse. Waypoints are locked by default, to avoid being moved accidentally.

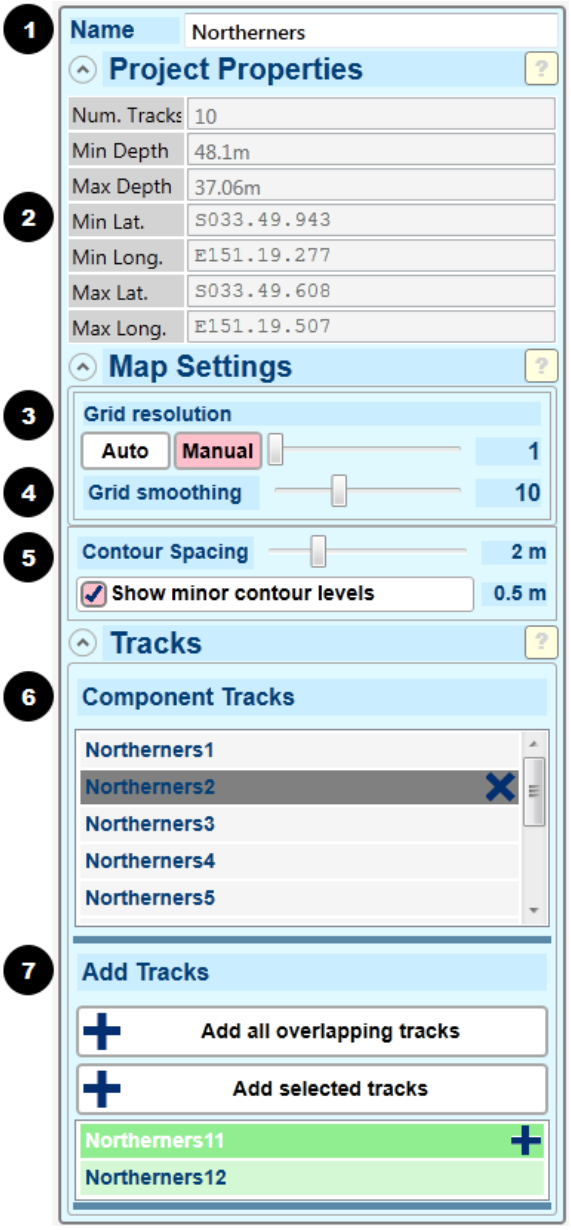
8. Waypoint Size

Adjust waypoint size. Waypoint size can be adjusted to preference using a slider.

9. Show or Hide Waypoints

Show or hide waypoints by waypoint set.

The Project Edit Pane



1. Name

The name of the project, which can be any string and does not need to be unique.

2. Properties

Read only display of various propject properties, including geographic and depth ranges, and number of component tracks.

3. Map Settings - Grid Resolution

The internal resolution of the map grid, in meters.

The higher the grid resolution value, the lower the map quality, and the less memory is used by the map. By default, grid resolution is set automatically to provide a reasonable compromise between memory usage and map quality. As the map area increases, the grid resolution is also raised. To set the grid resolution manually, select *Manual* mode and use the slider. This can be useful, for example, to improve performance on slower computers by increasing the grid resolution, or to produce a higher quality of a large map for export by temporarily lowering the grid resolution.

4. Map Settings - Grid Smoothing

The higher the value, the more the detail in the map is smoothed. High smoothing values can be useful to generate smoother contour lines, e.g. for export to a GPS device. Smoothing large maps with high smoothing values can be a time consuming process.

5. Map Settings - Contour Spacing

The depth interval between contour lines.

Contour lines are generated at set depth intervals on feet or metre boundaries. Contour lines are shown as *major lines*, drawn more prominently with accompanying depth labels, and *minor lines*, which are drawn less prominently and without labels. The depth spacing of major contour lines can be selected from within a range of values using the slider control. The spacing of minor contour lines adjusts automatically as the major line spacing is changed. The range of available values is determined by the depth units currently in use and the depth range of the current map project.

The visibility of minor contour lines can be toggled using the *Show minor contour levels* check box.

6. Tracks - Component Tracks

The *Component Tracks* list shows all of the tracks that are currently part of the map project. Tracks can be removed using the *Remove* button within the track row, or using the context menu activated using the right mouse button on the track item. The map updates automatically when a track is removed. Other options in the context menu are *Edit* and *Show in Global View*. A graphical track preview is displayed if the mouse pointer is held over the track item.

7. Tracks - Add Tracks

A track can be added to the current project if the minimum distance from the track to the current map is less than the maximum map size. For example, if the maximum map size is 3000m, then only tracks with a track point within 3000m of the current map boundary can be added to the project.

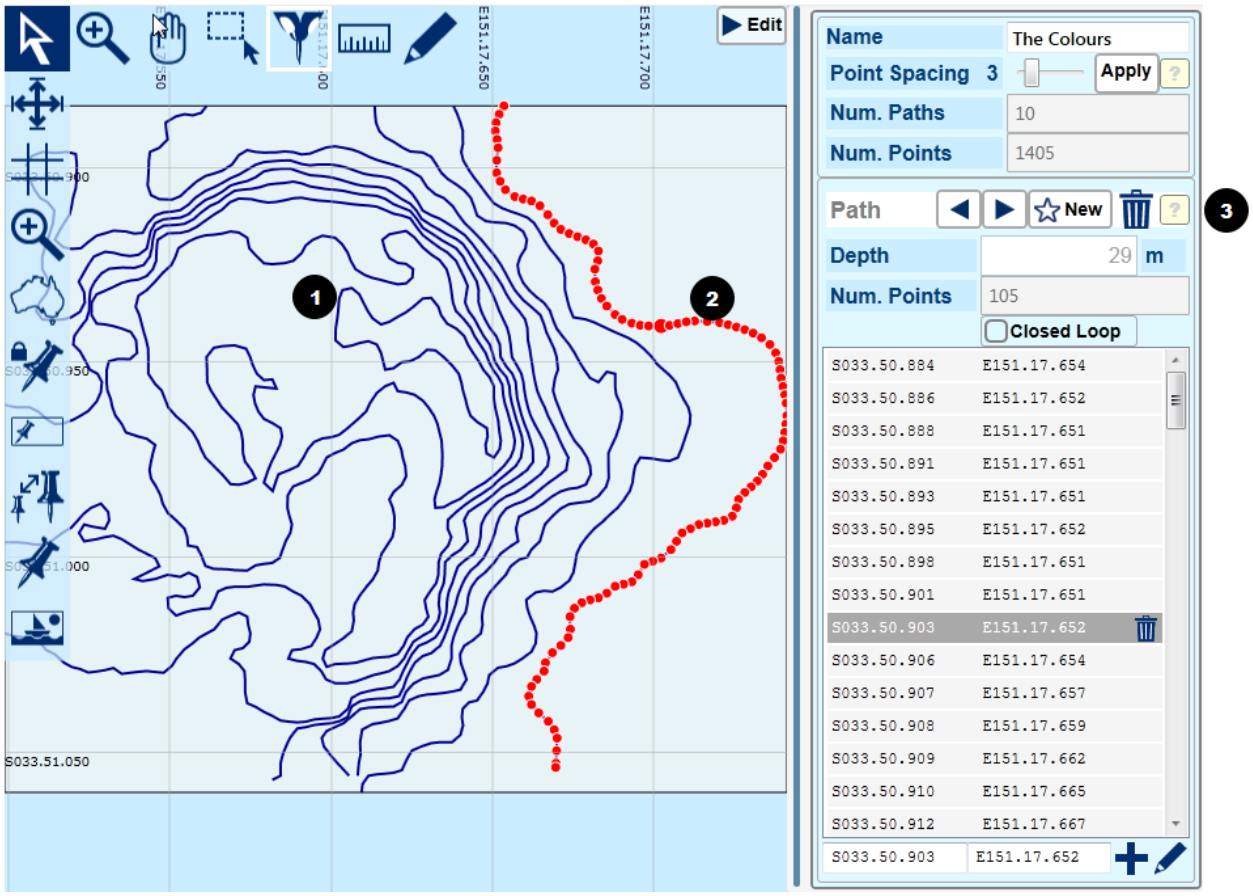
The list of tracks underneath the *Add Tracks* header contains only tracks that are close enough to the current project to be added. Tracks that overlap the current project are highlighted in green. Tracks that are within range of the current project, but do not overlap, are highlighted in orange. The contents of the tracks list updates as the size and/or position of the current map changes.

Tracks can be added to the project by clicking the *Add* button in the track list item. Alternatively, one or more tracks can be selected and added using the *Add selected tracks* button. Overlapping tracks can be added simply by hitting the *Add all overlapping tracks* button. The map updates automatically when a track is added to the project.

User Map

User maps combine contour lines and user drawn paths to create fishing maps for export to a chartplotter.

Overview



User maps are maps created specifically for export to a chartplotter.

Maps are produced by ReefMaster to help locate fishing areas. They are not suitable for navigation and should never be used for navigation.

Maps created within ReefMaster to be shown on a chartplotter consist of a collection of lines, known as *paths.* Paths can be sourced from contour lines in map projects contour views, or created directly within the user map edit window, either by drawing a path graphically or by individually entering path points.

Hand drawing paths can be useful, for example, for tracing lake outlines.

Entering path points by hand is a simple way to define regular boundaries that can be viewed on a chartplotter. For example, it is easy to enter simple shapes such as those that might be used to define marine park zones, no anchoring zones, go slow zones etc.

The image above shows a collection of contour lines **(1)** that have been added from a map project (see below, and Map Projects for information on how to create and export contour lines from a contour map). A selected contour line **(2)** highlights each individual path point, and is also selected in the edit pane path control **(3)**.

Creating a new User Map and Adding Contour Lines

To Create a New User Map

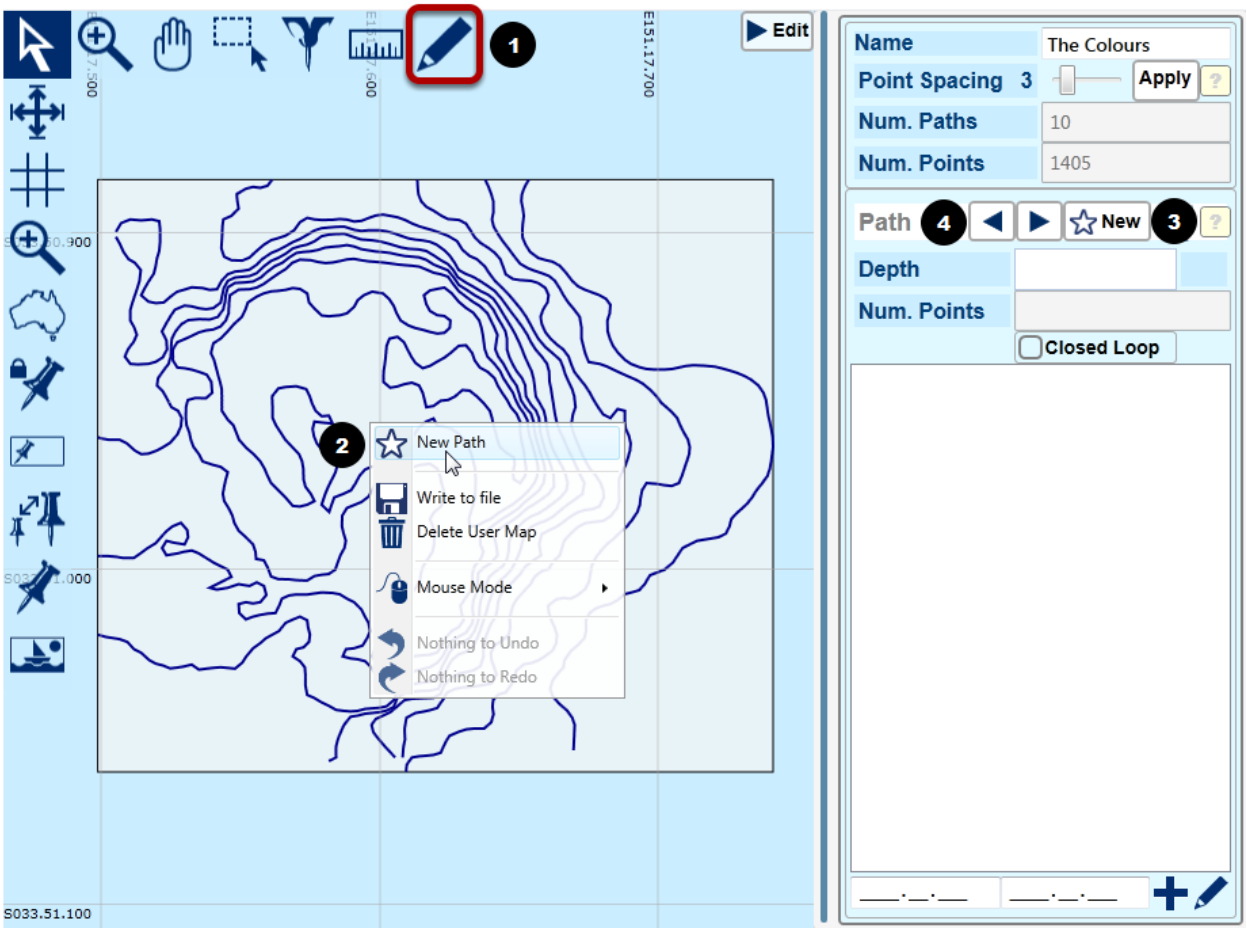
- Use the context menu of one of more selected contour lines in the *Project* contour view (above).

- Use the *new asset* button in the user map header of the *Asset Library*.
- Use the *new* option in the screen level context menu of the *Global View.*

To Add Contour Lines to a User Map

Contour lines can be added to a new or existing map using the context menu of one or more selected contour lines in the contour view (as shown above).

Adding Paths



Paths are lines formed by a series of locations, known as *path points.*

A path has a single depth that applies to entire path. Paths created from contour lines have the depth of the original contour line, whilst paths created by hand in the user map edit window are regarded as boundaries (not depth contours) and always have a depth of zero.

Adding a New Path:

1. Drawing Tool

Select the *Drawing Tool* **(1)** from the mouse mode tool bar.

- The drawing tool allows a path to be drawn by holding down the left mouse button and drawing the required path with the mouse.
- Individual path points can be added to a path by clicking the left mouse button.
- If a path is selected in the view when the drawing tool is used, then the path is extended with additional path points as they are added. The path is extended from the end nearest the mouse position.
- If no path is selected in the view when the drawing tool is used, a new path is created and selected.

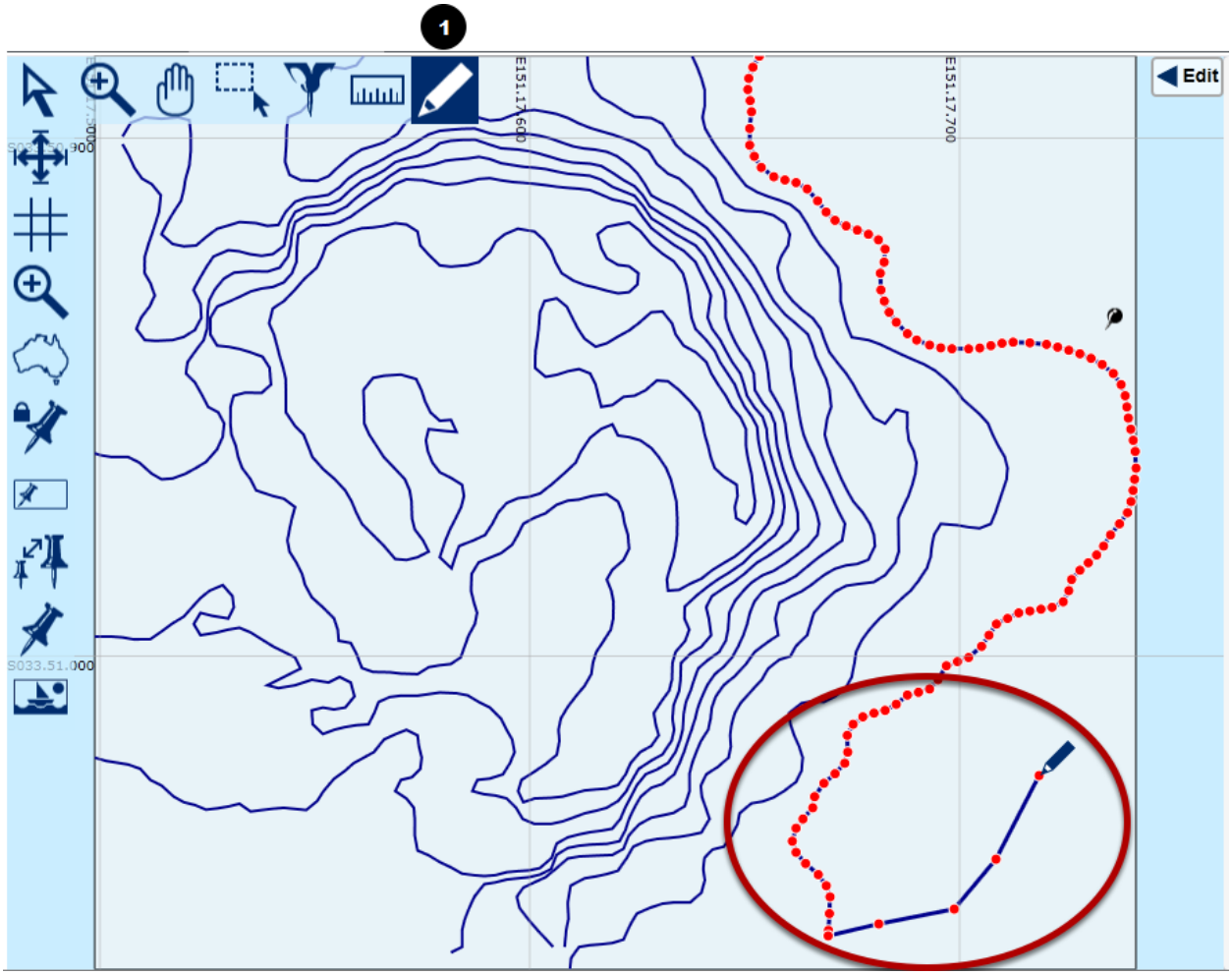
2. Context Menu

Select *New Path* **(2)** in the screen context menu.

3. New Path Button

Click the *New Path* button in the edit pane. Cycle through the selection of existing paths using the arrow buttons **(4)**.

Editing Paths with the Drawing Tool

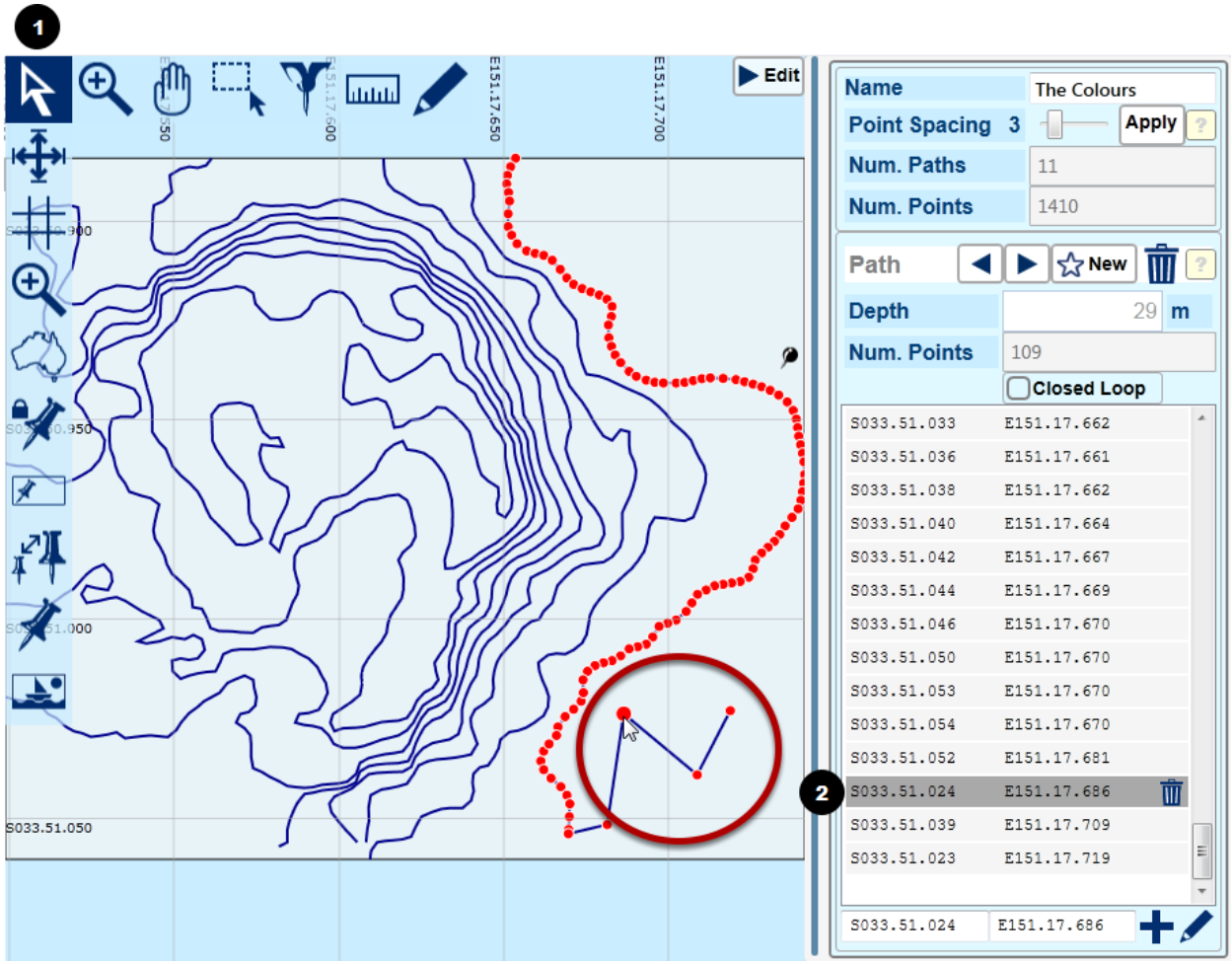


Existing paths can be extended by drawing with the drawing tool **(1)**.

- Select an existing path by left-clicking the path in the display area, with the mouse in *select* mode. Alternatively, a path can be selected using the *edit pane* (see below).
- With a path selected, select the *drawing tool* mouse mode.

- Left clicking with the mouse will extend the selected path from the nearest of the two path ends.
- Hold the left mouse button down and move the mouse to draw a path with continuous path points.

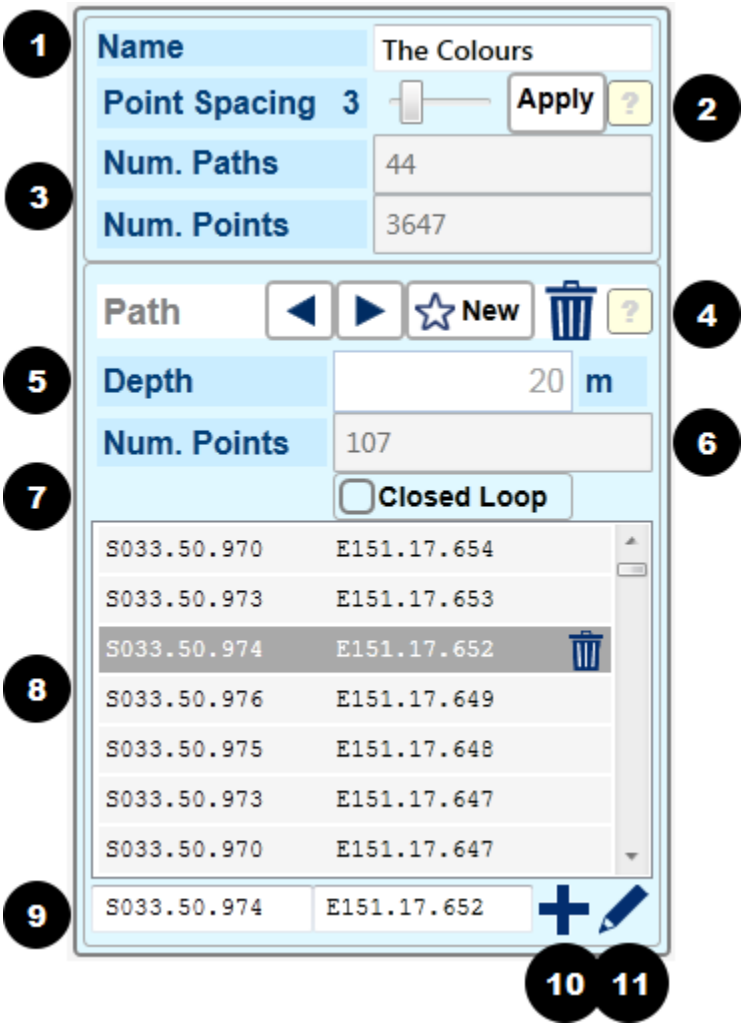
Editing Existing Path Points



Existing path points can be dragged or deleted with the mouse in *select* mode **(1).**

- Select a path point by left clicking the point in the graphical display with the mouse in *select* mode; the path point also becomes selected in the edit pane point list **(2)**.
- An individual path point can be moved by dragging with the mouse; the position updates in the edit pane point list as the point is moved.
- To delete a path point, either use the *delete* option in the context menu (right mouse button), or the *delete* button (trash can) shown in the edit pane path point list.

User Map Edit Pane



The user map edit pane shows user map properties and provides further path editing controls.

1. Name

2. Point Spacing

The minimum distance between consecutive points in a path, in metres. This value can be modified using the slider in the range 1-10m, with an initial default of 3m. The point spacing value applies to all paths within the user map. Points are not removed from the paths until the *Apply* button is pressed.

Increasing the point spacing can be useful if the total number of points within the user map needs to be reduced. For example, if the total number of points exceeds the maximum allowed in the target export device - say, a single Humminbird track with a maximum of 21000 points.

3. Number of Paths and Total Path Points

Read only values which cannot be edited.

4. Path Controls

Use the arrow buttons to change the currently selected path by moving through the path collection. The currently selected path is highlighted in the graphical display, and points from the path populate the path list **(8)**.

The *New* button creates a new path.

The currently selected path can be deleted using the *Delete* button.

5. Depth

The depth of the current path. This value is read only. If the path originated from a user map, the depth is the depth of the originating contour line. Otherwise, the depth is zero.

6. Number of Points

The number of points in the currently selected path.

7. Closed Loop

Check the *closed loop* check box to close the currently selected path. A closed path finishes at the same point at which it starts, making a complete boundary.

8. Path Point List

A list of all of the path points in the currently selected path. Points can be deleted using the *Delete* button. The path point edit area **(9)** is populated with the details of a selected path point, and the selected path point is also highlighted in the graphical display.

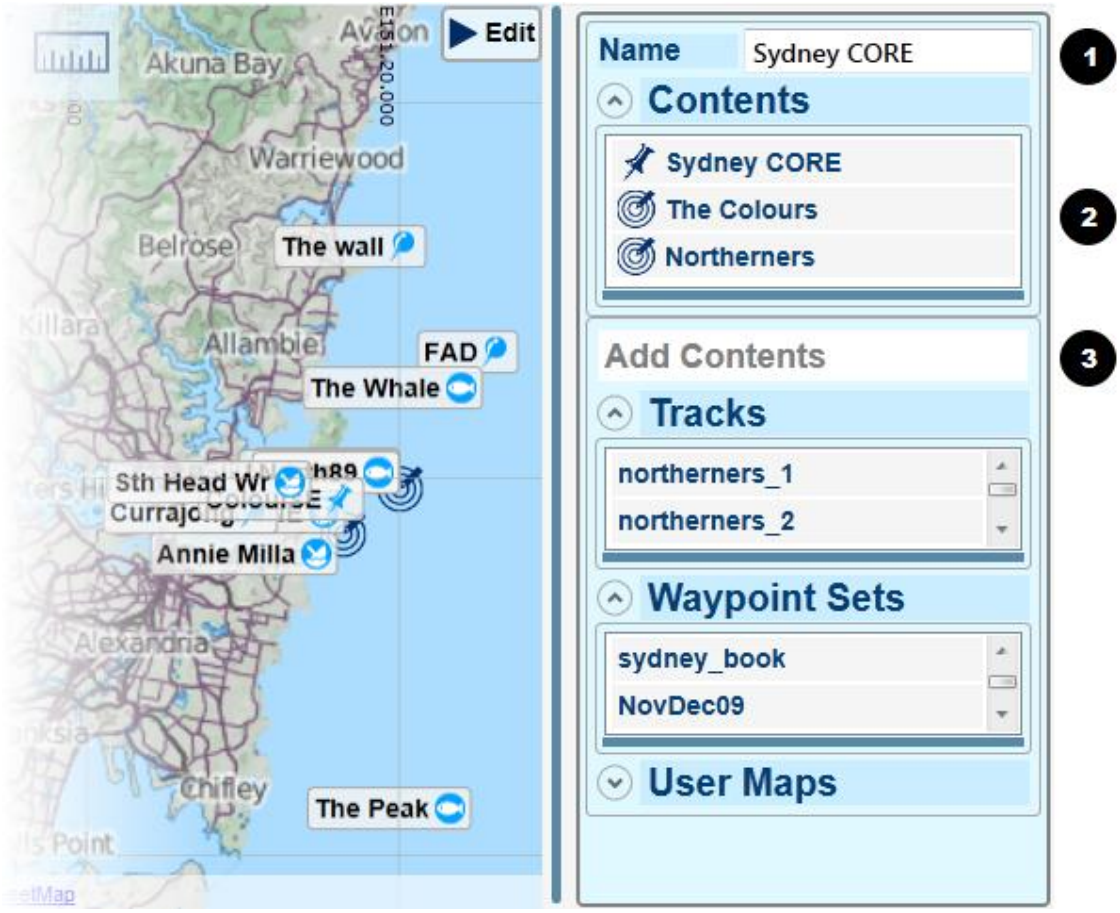
9. Edit Path Point

Edit existing path points or add new path points by hand in the edit path point area. If a path point is selected in the path point list, its details are populated in the edit path point area. To add a new path point, use the *Add* button **(10)**. To commit an update to the selected path point, use the *Edit* button **(11)**. Note that new path points are always added to the end of the path.

Data Set

A Data Set is a collection of assets grouped for export.

Data Set



A *Data Set* is a collection of assets grouped together for export. Data sets make it easy to maintain a set of assets that are commonly exported together.

1. Name

The name of the data set.

2. Contents

Data sets can contain any combination of tracks, waypoint sets and user maps. The contents of the data set are shown in the *Contents* list, as well as in the graphical display.

Asset types are identifed in the contents list by the icon at the left of the asset row. Assets can be removed using the *Remove* button at the right of the row, or through use of the row context menu.

3. Add Contents

Add Contents contains separate lists of tracks, waypoint sets and user maps. Individual assets of each type can be added to the data set by using the *Add* button, at the right of the asset row, or through use of the row's context menu.

Assets can also be added to a data set through use of the screen-level context menu in the data set's graphical edit area, or through the use of individual asset context menus in the *Global View*.

Background Image

Images can be imported and calibrated for use as a map background.

Background Images

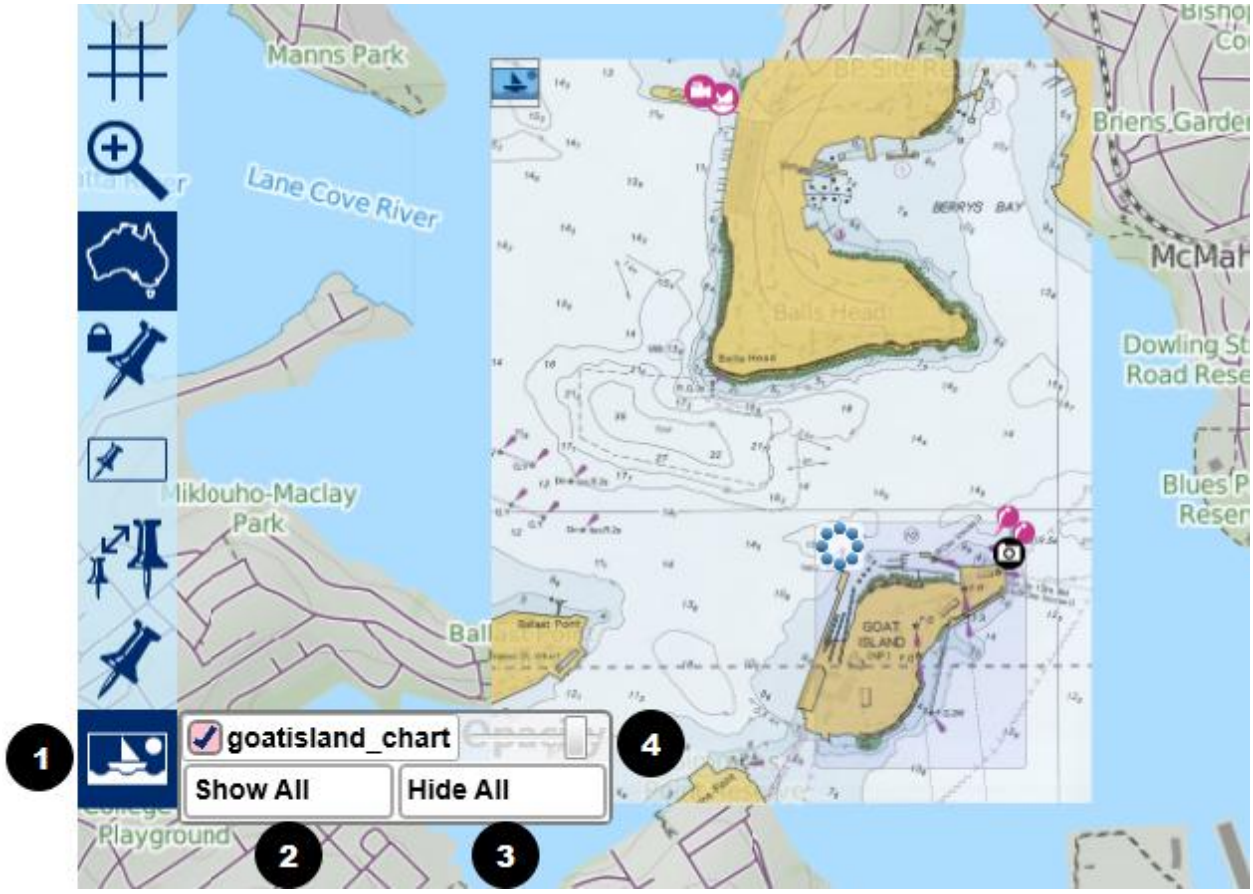
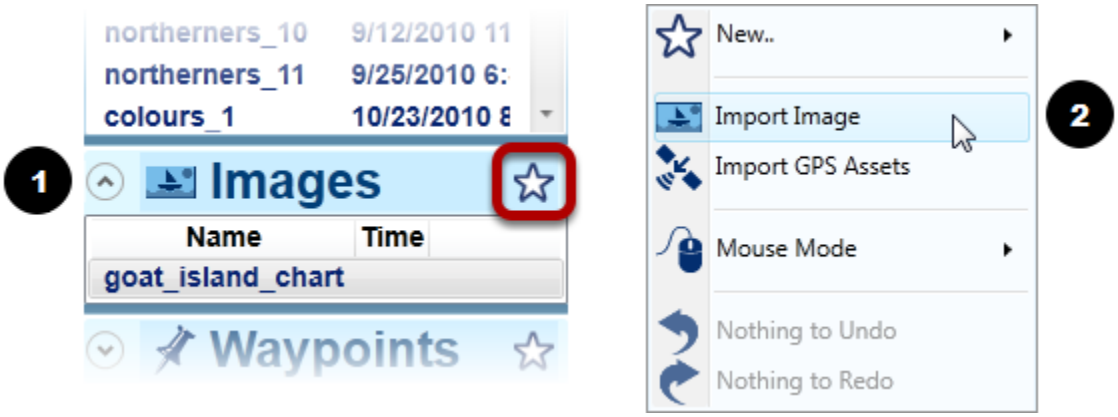


Image files can be imported and used as background images in the graphical display areas of most asset types. Images need to be calibrated after import so that they are overlaid in the correct size and position.

The display of images can be controlled using the *Images* toolbar button **(1)**, which brings up a list of all imported images. The visiblity of individual images can be toggled using the checkbox next to each image name, or else all images can be shown or hidden using the *Show All* and *Hide All* buttons **(2, 3)**. The opacity of individual images can be adjusted using the slider next to each image list item **(4)**.

Importing a Background Image

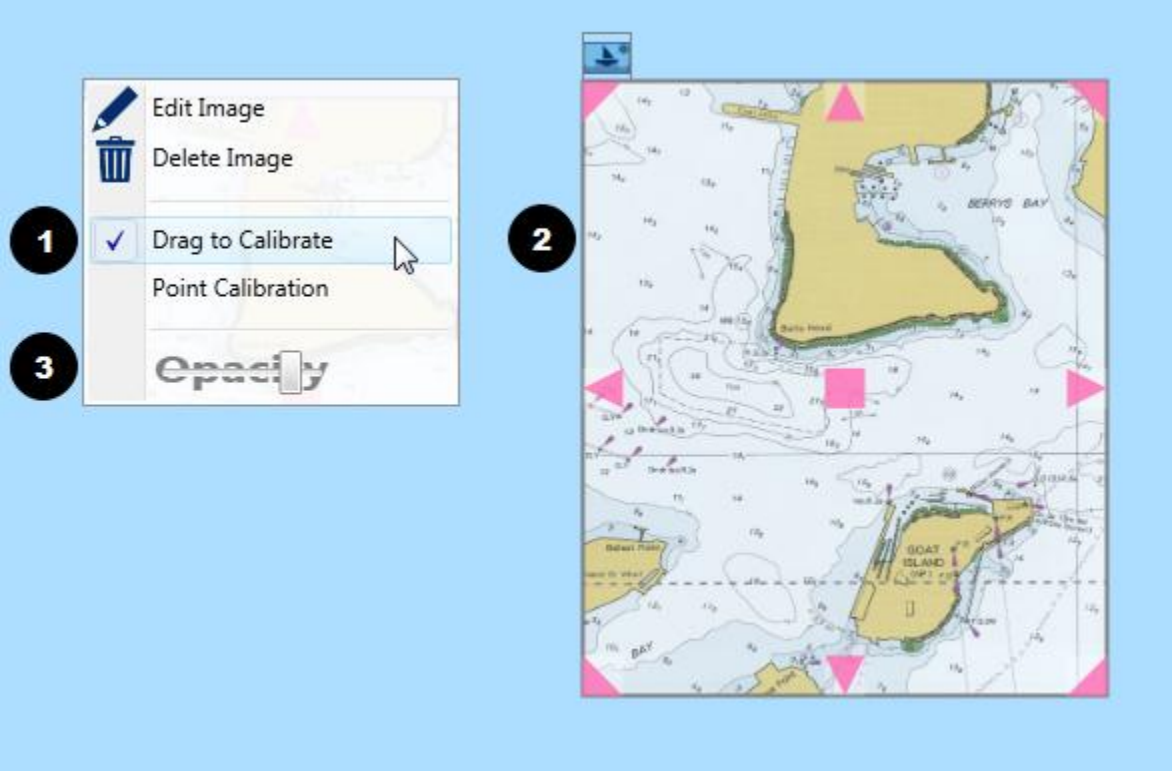


To import a new background image, either use the *New Asset* button (circles) in the Images header of the *Asset Library* **(1)** or select the *Import Image* option from the screen-level context menu in the *Global View* **(2).** An open file dialog is shown, where a single image file can be selected. Files can be of type .jpg, .png or .bmp. Once a file has been selected, it is loaded and shown in a new tab, from where it can be calibrated.

Calibrating a Background Image

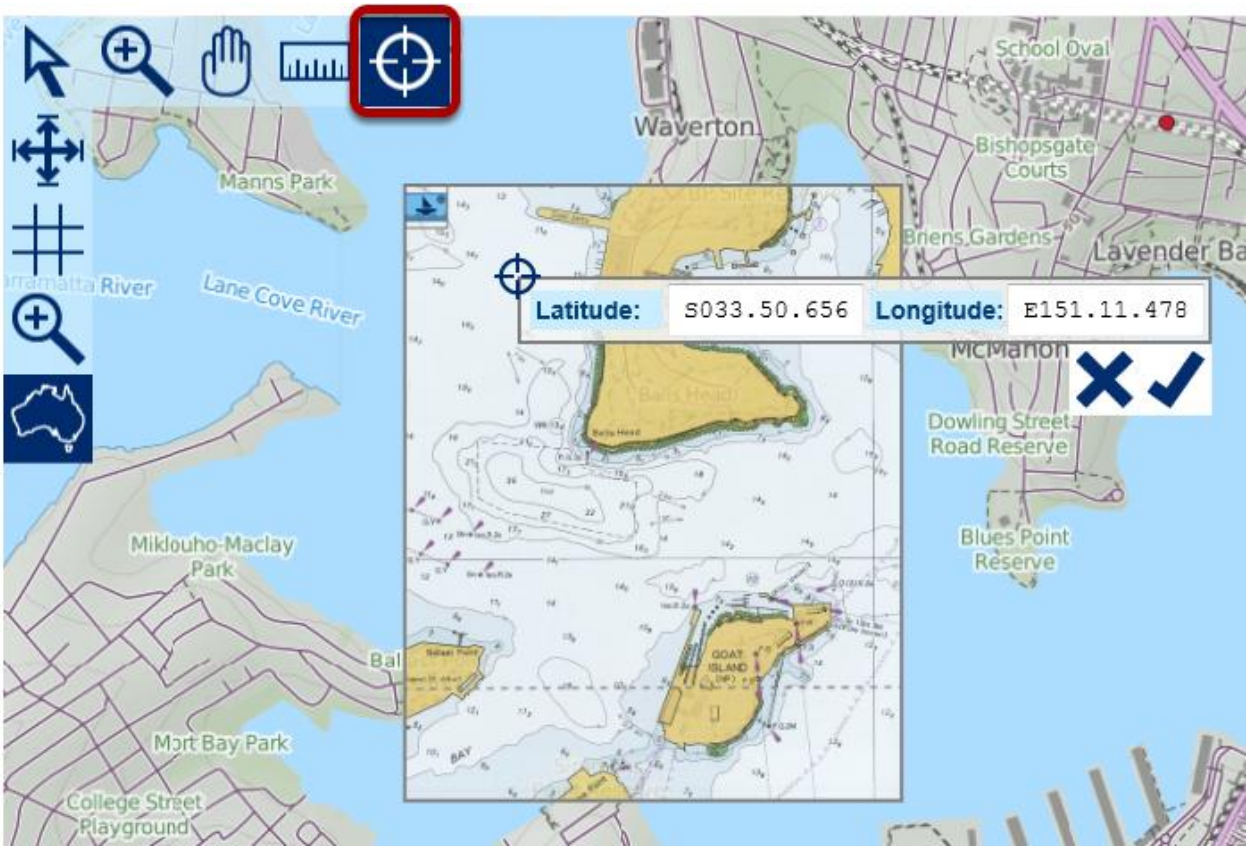
When the new background image is first imported, it is given an starting extent centred in the current workspace. The image needs to be calibrated so that it shows in the correct size and in the correct location. Images can be calibrated in two ways; *Drag to Calibrate* or *Point Calibration.*

Drag to Calibrate



Images can be graphically calibrated when in *Drag to Calibrate* mode. Select the menu item *Drag to Calibrate* from the context menu of the background image **(1)**, activating by right-clicking on the image icon at the top left of the image. The image will enter drag to calibrate mode **(2)**, with grab handles in the centre and each edge and corner. The square grab handle in the centre of the image is used to drag the entire image. The handles in the corners and edges of the image are used to size the image. Grid lines can assist with calibration, as can background maps; vary the opacity of the imported image using the context menu **(3)** so that items behind can be seen more clearly.

Point Calibration



Images can be calibrated by entering the locations of two or more specific points. Note that images are always assumed to be north facing; ReefMaster does not rotate images, and images are always scaled uniformly. ReefMaster takes the average of all calibration calibration points that are entered.

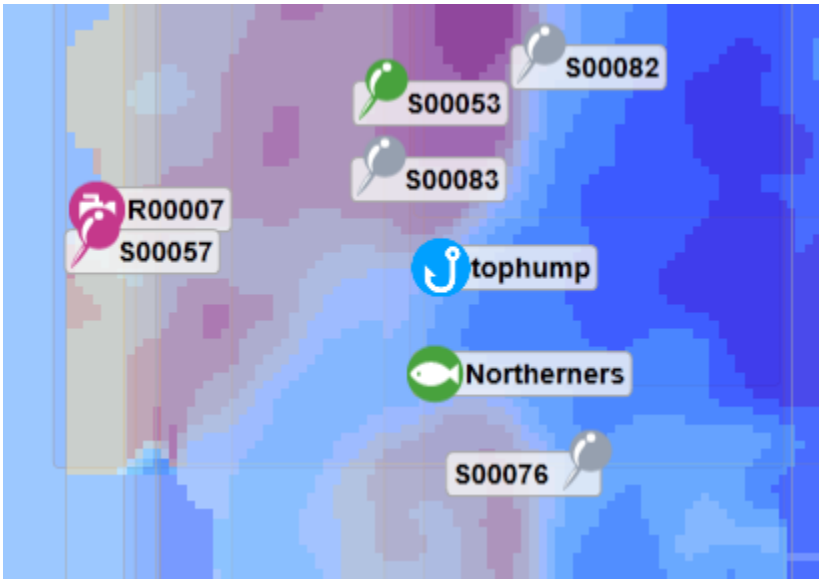
To enter a calibration point, select the *Calibration* mouse mode (circled, only available in the *Background Image* edit window). Click with the left mouse button on the calibration location, and enter the location details into the coordinate edit box popup window. Once two or more calibration points have been entered, the image will be moved and sized accordingly. To calibrate using just two points, the two points should share neither latitude nor longitude (ie, they should be on different horizontal and vertical locations within the image).

Waypoints

Waypoints and Waypoint Sets

Editing and creating waypoints and waypoint sets

Waypoints and Waypoint Sets

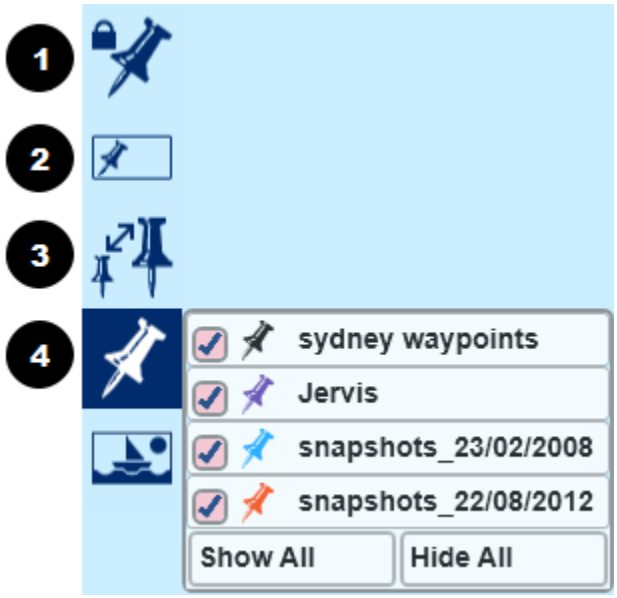


A waypoint is a point at a specific geographic location, stored as a pair of coordinates specifying longitude and latitude. Waypoints can contain further information, such as a name, depth at the location, notes and attached images. Additionally, all waypoints have an assigned *symbol*. Each waypoint belongs to a *Waypoint Set,* which is simply a named collection of one or more waypoints. Waypoint sets are differentiated by colour; each waypoint set is assigned a colour, and all waypoints within that set are shown in that colour. The image shows a group of waypoints, belonging to several different waypoint sets.

Viewing Waypoints and Waypoint Sets

- Waypoint sets are listed under the Waypoints header in the *Asset Library*, from where they can be opened for editing, exported to file or deleted.
- Waypoints can be viewed from the edit windows of all asset type, with the exception of tracks.
- When viewing waypoints graphically, which waypoint sets are visible, and how individual waypoints look is controlled using the *Waypoint Toolbar* (circled - see below).

Waypoints Toolbar



1. Lock or Unlock Waypoints

Locking waypoints prevents them from being dragged by the mouse (when using the *Select* tool), which is useful to prevent accidentally moving waypoints. Use the *Lock or Unlock Waypoints* button to toggle the waypoint lock; the icon will change to an unlocked padlock when waypoints are unlocked.

Waypoints are locked by default; a large padlock is superimposed on the edit area when trying to drag a locked waypoint.

2. Show or Hide Labels

Show or hide waypoint name labels using the *Show Labels* toggle button. Note that display performance can be reduced if a very large number of waypoint labels is shown on screen.

3. Waypoint Size

Waypoints can be shown in two sizes; large and small. Use the *Waypoint Size* toggle button to switch between the two.

4. Show or Hide Waypoint Sets

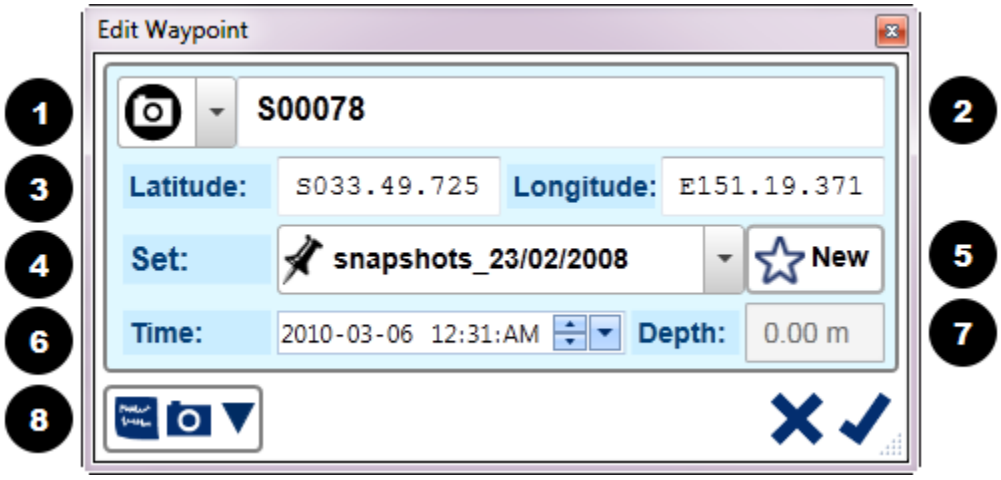
Toggle the display of individual waypoint sets within the edit area. A list of avaiable waypoint sets is shown when the *Show or Hide Waypoint Sets* button is pressed. Toggle the display of individual waypoint sets individually using the check-boxes shown next to each waypoint set. Use the *Show All* or *Hide All* buttons to show or hide all waypoints.

Creating and Editing Waypoints

Waypoints in ReefMaster can either be imported from a GPS device or created within ReefMaster.

New waypoints can be created by clicking in the graphical display area with the mouse in *Drop Pin* mode (circled). A waypoint is created at the position of the mouse pointer and the *Edit Waypoint* window is shown *(see below)* where further waypoint details, such as name and precise coordinates, can be edited.

The Edit Waypoint Window



Individual waypoints can be edited in the *Edit Waypoint* window. The *Edit Waypoint* window can be opened by:

- Double clicking on a waypoint in any graphical view, whilst the mouse is in *select* mode.
- Double clicking on a waypoint in the waypoint list in the *Waypoint Edit Pane.*
- Using the right mouse button menu in either graphical or list views and selecting the option *Edit Waypoint.*

1. Symbol

Select a waypoint symbol from the drop-down list (*see below for more on waypoint symbols*).

2. Name

Waypoint name. ReefMaster can accept any string as a waypoint name, but many GPS devices cannot. Be aware of the limitations of your target device when entering waypoint names. *For example, Humminbird waypoint names are limited to 11 characters long and display some characters differently, or not at all (e.g. the underscore character). When exporting, waypoint names may be truncated to suit the target device.*

3. Latitude and Longitude

Latitude and longitude can be entered by hand using the latitude and longitude fields. The format is specified in the *Global Settings*. All coordinates in ReefMaster use WGS84.

4. Waypoint Set

The waypoint set that the waypoint belongs to. All waypoints belong to a waypoint set. The waypoint can be moved to another set by selecting a set from the drop-down list box of available waypoint sets. Use the *New* button **(5)** to create a new waypoint set and move the waypoint into it. Note that copying a waypoint to another set cannot be done from within the edit waypoint window.

6. Time

The time the waypoint was taken. This can be edited if required.

7. Depth

The depth of the waypoint, as recorded by the originating device. This cannot be edited.

8. Show/Hide Notes and Images

Show or hide the notes and images control - see below.

Waypoint Notes and Images

Notes and images can be added in the notes and images tab in the *Edit Waypoint* window.

- Show or hide the notes and images tab using the button **(2)**.

- Images or notes are added using the *Add* button **(4)**. Delete an image or a note using the *Delete* button, **(1)**.
- Images can be 'popped out' of the edit window using the button **(3)**. The image is shown framelessly in the centre of the screen and can be further zoomed with the mouse wheel. Click the screen away from the image to close.
- If more than one image or note is attached to the waypoint, move through them using the left and right arrow buttons **(5)**.

Waypoint Symbols

ReefMaster has its own collection of waypoint symbols, most of which are related to the marine environment.

Importing Waypoint Symbols

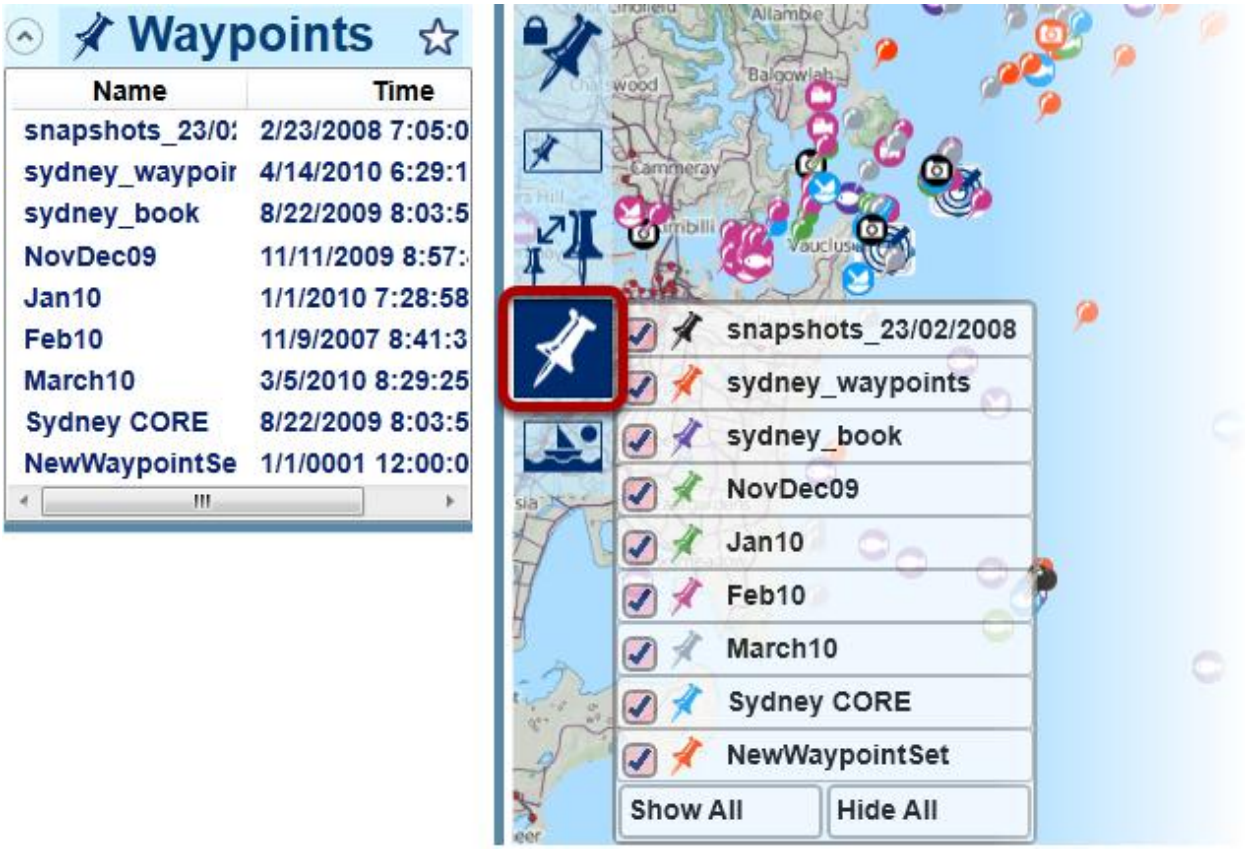
Many of the ReefMaster waypoints have near equivalents on most brands of GPS device. ReefMaster has internal mappings to the appropriate symbols for Humminbird and Lowrance devices, and is able to make 'educated guesses' when importing waypoints from generic GPX files. This means that when importing a waypoint, ReefMaster tries to choose an appropriate symbol to match the symbol already

assigned to the imported waypoint. If an appropriate symbol is not available, the default symbol is used (round pin).

Preservation of Symbols on Export

When importing waypoints, the original waypoint symbol is saved, so that the same symbol can be used when exporting - regardless of the waypoint symbol that is shown in ReefMaster.

Waypoint Sets



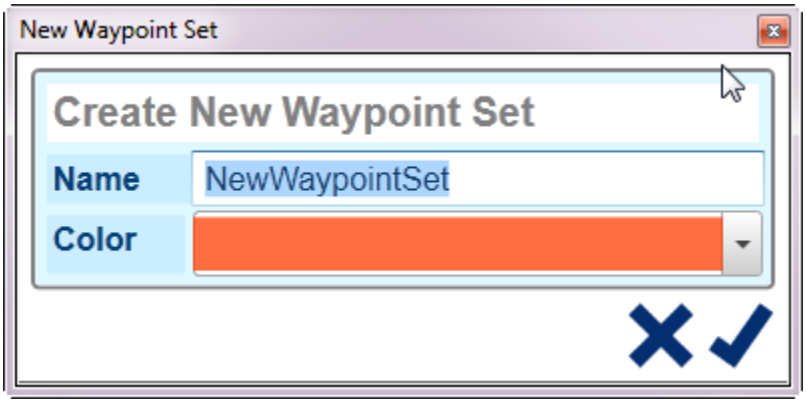
All waypoints belong to a *Waypoint Set,* which is simply a named collection of one or more waypoints.

Individual waypoints belong to one and only one waypoint set, but a waypoint may be copied to multiple waypoint sets. Once a copy has been made of a waypoint, no link is maintained between the original waypoint and the copy; for example, changing the name of the copy will not affect the name of the original waypoint.

Waypoint sets are single assets and as such can be exported individually or added to *Data Sets*.

Any number of separate waypoint sets can be maintained in a single workspace, and viewed together in any edit window that contains the *Waypoint Toolbar* (all asset types except *Track*). The visibility of Individual waypoint sets in a particular edit window can be toggled using the *Show/Hide Waypoints* button, circled above.

Creating a New Waypoint Set



A new waypoint set can be created by using:

- The *New Asset* button in the Waypoint header.
- The *New* button in the *Waypoint Edit Pane* (see below).
- The *New Waypoint Set* option when copying or moving waypoint(s).
- The *New Asset* option in the *Global View* screen-level context menu.

- The *New Waypoint Set* button in the *Waypoint Edit Window* (see above).

The *New Waypoint Set* window is show, where a name and colour can be selected for the new set.

Moving and Copying Waypoints Between Waypoint Sets

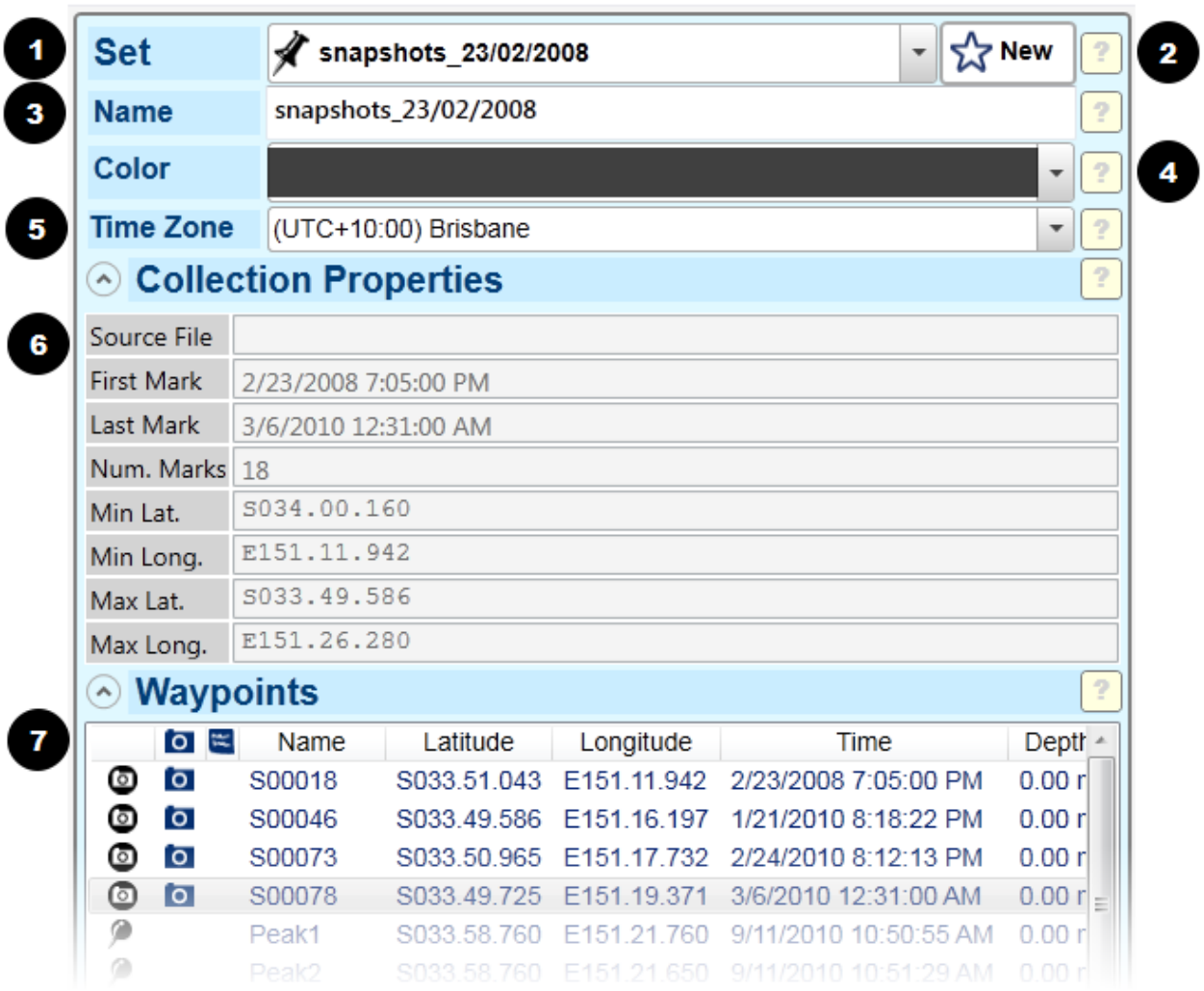
Waypoints can be freely moved or copied between waypoint sets, either singly or in groups.

Waypoints can be copied or moved in the following ways:

- Using the context (right mouse button) menu of singly or muliply selected waypoints in the graphical edit area. Multiple waypoints can be selected using the region select tool. When moving or copying a group of selected waypoints, the waypoints can originate from any number of different waypoint sets.
- Using the context menu of one or more selected waypoints in the waypoint list in the *Waypoint Edit Pane* (see below).
- Individual waypoints can be moved to another waypoint set from within the *Waypoint Edit Window*.

When copying or moving waypoint(s), all existing waypoint sets are shown, along with the option to create a new waypoint set.

The Waypoint Edit Pane



The *Waypoint Edit Pane* contains properties and edit options for waypoint sets.

The waypoint edit pane is part of the *Global View,* displayed by using the *Waypoints* button in the display area of the global view or by selecting a waypoint set for editing from the *Asset Library,* through double clicking or use of the context menu.

1. Active Waypoint Set

Set the active waypoint set, for which the properties in and waypoint list are shown.

2. New Waypoint Set

Create a new waypoint set.

3. Name

The name of the waypoint collection. Waypoint set names are only used by ReefMaster so there are no length or character restrictions.

4. Colour

The colour for the waypoint set can be selected from the drop-down list.

5. Time Zone

The time zone of the waypoint set. All waypoints within a set are assigned to the same time zone. If waypoints within a set belong to different time zones, and viewing local times is required, the set should be split such that all waypoints in a set belong to a single time zone. The time zone property only affect the *display* of waypoint times, not how they are stored.

6. Collection Properties

Derived, read-only properties of the waypoint set including number of waypoints, geopgraphic and time ranges. If the waypoint set was imported from a file, the original filename is also shown.

7. The Waypoint List

- Each waypoint within the active waypoint set is shown as a separate item in the list with *Symbol, Name, Latitude* and *Longitude, Time* and *Depth* columns. Icons indicate whether images or notes have been added.
- If an image is attached to the waypoint, it can be previewed by holding the mouse pointer over the image icon. Single clicking the icon 'pops out' image to the centre of the screen, from where it can be further zoomed with the mouse wheel if required. The image can be closed by clicking in any part of the screen apart from the image.
- The list can be sorted on any column value by single clicking on the column header. Clicking again on the column header to reverses the sort order.
- Waypoints can be singly or multiply selected in the list; to select multiple waypoints, use the left mouse button in conjunction with the ***Shift*** key. Toggle individual selected waypoints using the mouse left button in conjunction with the ***Control*** key.
- Standard waypoint actions as *Edit, Delete, Write to File*, *Move or Copy to Set* can be performed on selected waypoint(s) using the context menu, activated with the right mouse button. The additional option *Show in Global View* pans and zooms the global view to show the selected waypoint.

Exporting Data

Exporting Assets to a GPS Device

Export waypoints, tracks and map contours to a GPS device

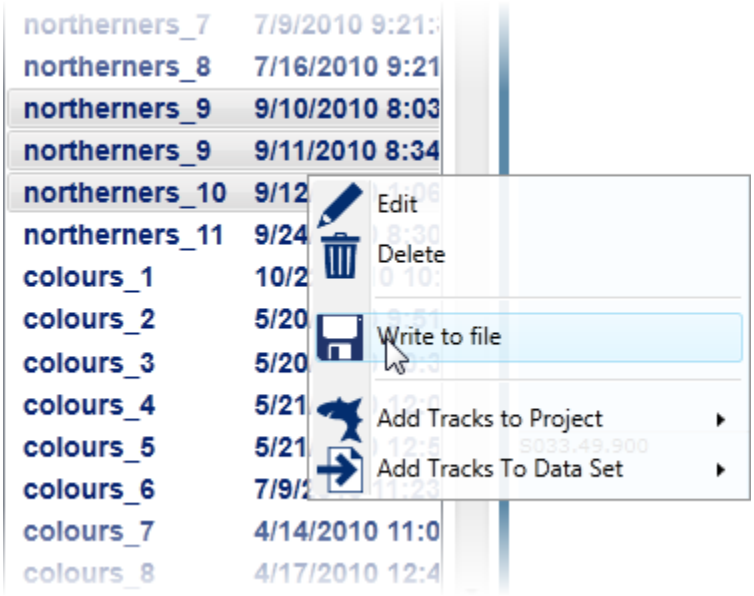
Selecting Assets for Export

Assets that can be exported to GPS units are *tracks, waypoint sets, user maps* and *data sets.* Any number and combination of exportable assets can be selected for export, from a single waypoint to the entire contents of the workspace.

Use a *Data Set* to save groups of assets that are commonly exported together, and then simply export the data set via the context menu in the *Asset Library.*

To create groups of assets for export 'on the fly', use one of the following methods:

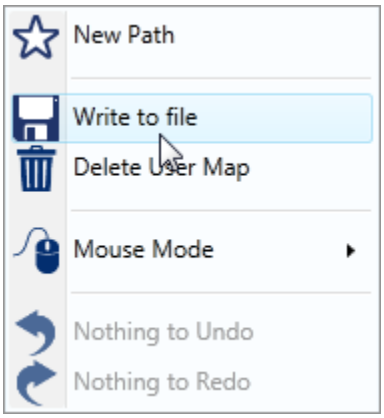
Selecting Assets for Export - the Asset Library



Select one or more *tracks, waypoint sets, user maps* or *data sets,* then choose the option *Write To File* in the context menu, activated with the right mouse button. Only

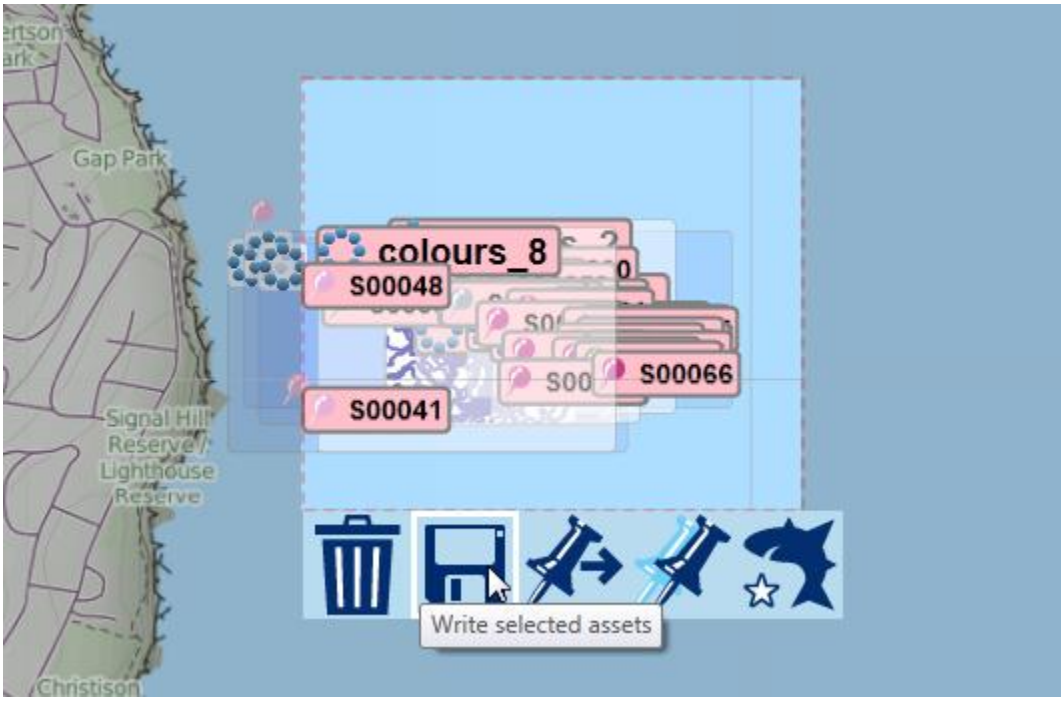
assets of one type can be exported via the asset library. To export assets of different types together, use either a *Data Set* or select assets for export graphically in the *Global View* (see below).

Exporting an Individual Asset from the Asset's Edit Window



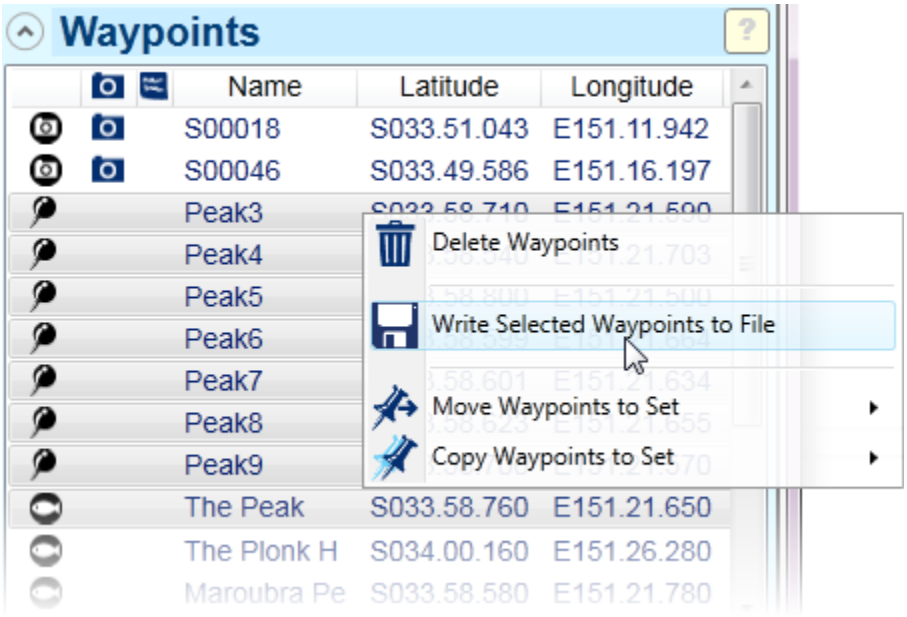
Use *Write to File* option in the screen-level context menu, activated by right clicking with the mouse in empty space within the graphical edit area.

Selecting Assets for Export in the Global View



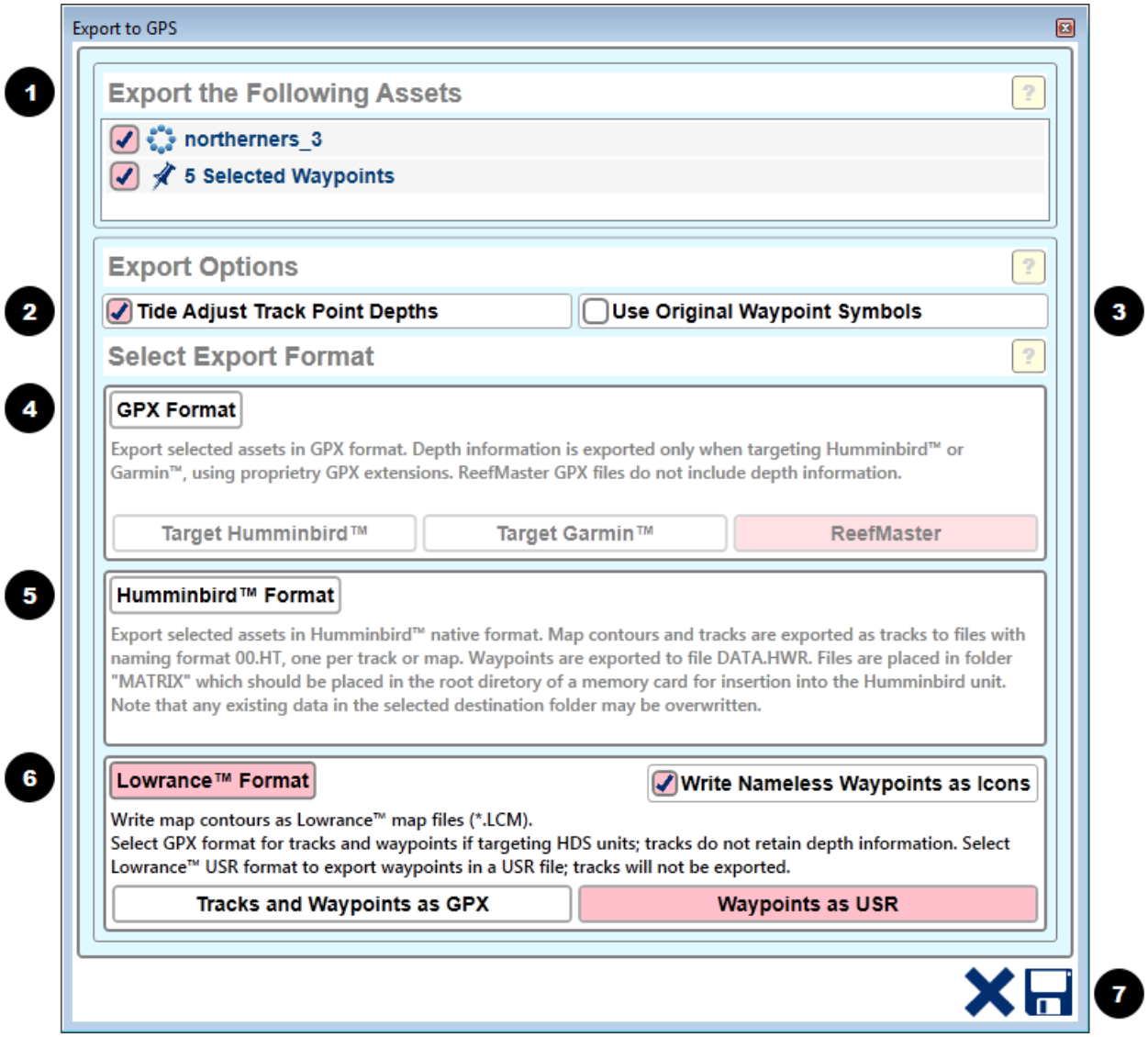
Select the assets required for export by drawing a rectangle with the mouse, with the mouse in *regino select* mode. Choose the option *Write Selected Assets* from the pop-up toolbar. Alternatively, right click a selected asset and choose the menu option *Write Selected Assets to File*. Single assets may also be selected for export in this way.

Selecting Waypoints for Export from the Waypoints List



Select one or more waypoint in the *Waypoint List* in the *Waypoint Edit Pane* and choose the options *Write Selected Waypoints to File* from the right mouse button activated context menu.

The Export to GPS Window



After assets have been selected using one of the above methods, the *Export GPS Assets* window is displayed.

1. Asset List

Select or de-select assets for export using the checkboxes in the asset list. Note that depending on what export format is chosen, not all assets in the list may be exported. For example, tracks will not be exported if the Lowrance™ USR format is selected.

Export Options

2. Tide Adjust Track Point Depths

When exporting tracks, adjust the depth values in track points using tide data associated with the track (if any).

3. Use Original Waypoint Symbols

When exporting waypoints, use the original device symbol associated with the waypoint on import, if any. This option is useful if the original waypoint symbol does not have an equivalent in ReefMaster and the symbol needs to be preserved on the original device. Note that this option may give unexpected results if the waypoints are exported to a different device than that from which they were imported.

Export Formats

4. GPX

Export selected assets in GPX format. GPX stands for GPs eXchange format, and is a common, text based format that can be read by many different applications, as well as by some GPS devices.

Exporting assets in GPX format results in a single file, with the extension .gpx. Map contours are exported as segmented track logs. GPX format is a good choice when exporting data for use in other software applications, or when exporting data for use in a GPS device that is not natively supported by ReefMaster. In this case, the device manufacturer probably has a PC based application that can convert GPX files into the format required for import into that GPS device.

Target Humminbird™, Target Garmin™, ReefMaster

The standard GPX file format does not contain depth information for track points. However, the file format can be extended such that it does. Both Humminbird™ and Garmin™ use a modified GPX file format that includes depth information. If targeting applications by these manufacturers, or other applications that can read this depth information, select the appropriate option here. The *ReefMaster* option produces a standard GPX file with no depth information in the track logs.

5. Humminbird™

Export selected assets in Humminbird™ native format. Map contours and tracks are exported as tracks to files with naming format 00.HT, one per track or map. ReefMaster uses some undocumented Humminbird™ file format features to add multiple, separate contour lines to a single track. Waypoints are exported to the single file DATA.HWR. Files must be placed in a folder titled ‘MATRIX’, at the root of a memory card, for import into a Humminbird™ GPS device. Note that any data already present in the folder selected for export may be overwritten.

6. Lowrance™

Export user maps as LCM map files, with either; waypoints and tracks in a GPX file, or waypoints **only** in a Lowrance™ USR file.

Maps are exported as LCM files, which can be imported into Lowrance GPS devices and shown as labelled contour lines. Individual LCM files cover a set geographic range; ReefMaster generates as many LCM files as required, with increasing numeric filename suffixes, to contain the selected user map(s).

Tracks and Waypoints as GPX, Waypoints as USR

Waypoints and tracks can be exported in a GPX file for import into HDS series Lowrance™ devices, or they can be exported in a single USR Lowrance™ native file format for import into HDS or earlier devices. Note that tracks are not exported in USR

files. Note also that the full range of HDS waypoint symbols is not available in USR format.

Write Nameless Waypoints as Icons

Lowrance has the concept of *icons*, which are waypoints that carry minimal information - just location, and symbol. Icons have no name. When an icon is imported from a Lowrance native file, it is stored in ReefMaster as a waypoint with no name. When writing waypoints to a Lowrance USR file, waypoints with no name can be written as icons or waypoints; choose which using this check-box. If waypoints without a name are written as waypoints, they are given a name of the form icon{n}.

7. Save Button

When the required options have been selected. click the save button to start the export. A safety warning and disclaimer must be acknowledged before the file(s) are written.