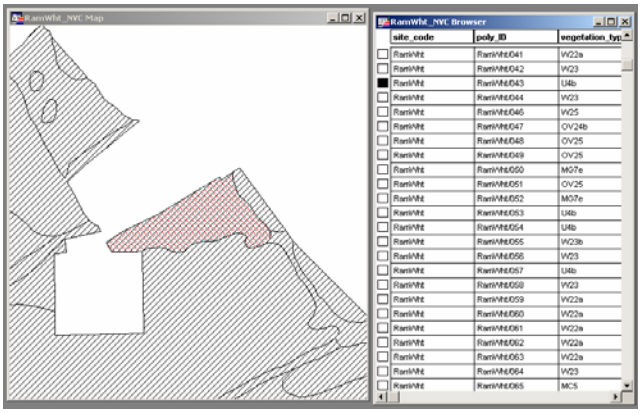
Maritime Cliff and Slope Inventory: digitising guidelines and quality assurance procedures

This document illustrates the recommended approach to creating a MapInfo dataset conforming to the Maritime Cliff and Slope Inventory specifications. It is intended for use by contractors creating Inventory data, and Natural England staff assessing the quality of contract products. Any queries regarding the interpretation of these guidelines should be addressed to the Natural England project officer.

Quality assurance (QA) checks are described for the majority of the topics, but remedial action has not been suggested as it is often specific to the situation. The checks should be carried out in addition to a visual check of the spatial and attribute data.

Often the QA check will take the form of a query that will produce a browser window from which problem records can be identified. In this situation, an efficient way of assessing the problem is to use the browser and map window in a tiled arrangement, and on selecting a row in the browser table, the menu command *Query* > *Find Selection* (in MapInfo 7.5 and later, this command has the keyboard shortcut of Ctrl + G) will display the record in the map window:



Using *Query* > *Find Selection* to find records

Table names and attribute data

Table names and structure:

The inventory data tables should be named according to TIN010 *Maritime Cliff and Slope Inventory: MapInfo Table Specification*, and should have attribute names and types that correspond to the specification.

When entering attributes, it is recommended to add them immediately following the creation of an object to minimise the chance of error.

Table structure QA:

This process will display the name and data type of each attribute in a table:

- Open the table to check, and run the following menu command *Table* > *Maintenance* > *Table Structure...*
- In the dialog that appears, choose the table from the list and click Ok. If there is only one table open, then a list will not appear, move to the next step.
- The dialog window that appears lists the attribute names and types.

Unique IDs:

Most Inventory tables possess an attribute that should contain unique values, generally an ID field, whether an attribute's values should be unique or not is indicated in the table

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specification. The exception is the mosaic table, which can contain duplicate entries for a given vegetation polygon ID.

Unique ID QA:

This procedure will identify any duplicated values of an attribute.

- Run *Query > SQL Select...* and fill the dialog box out as follows, text in italics needs to be replaced with a table or column name.

Table 1

Dialog component	Text to enter
Select:	Unique ID column , Count(*)
From Tables:	Insert table name here
where Condition:	
Group by Columns:	Unique ID column
Order by Columns:	2 desc
into Table Named:	Duplicate_value_check

- Tick the Browse Results box to view the output, and click Ok to run the query.
- Duplicate ID values should appear at the top of the browser window, and have values in the second column greater than 1 (Figure E shows two duplicate IDs).

poly_ID	Count
RamWht/548	2
RamWht/169	2
RamWht/002	1
RamWht/003	1
RamWht/004	1
RamWht/005	1
RamWht/006	1
RamWht/007	1
RamWht/008	1
RamWht/009	1
RamWht/010	1
RamWht/011	1
RamWht/012	1

The output of a duplicate value query mage

- Note that you cannot edit the output from this query, and will have to edit the original table to correct the duplicates.

Attributes have entries:

Generally attributes should contain entries for every record in a table. If a character type attribute does not contain an entry, then it is blank, however, a numeric type attribute will contain a zero value if no data has been entered, potentially being confused with valid entries of zero.

Blank attribute check:

This process will identify blank entries for a text attribute.

- Run *Query > SQL Select...* and fill the dialog box out as follows, text in italics needs to be replaced with a table or column name.

Table 2

Dialog component	Text to enter
Select:	*
From Tables:	Insert table name here
where Condition:	Character attribute name = “”
Group by Columns:	
Order by Columns:	
into Table Named:	Blank_entries

- Tick the Browse Results box to view the output, and click Ok to run the query.
- To check a numeric field, such as the percentage cover of a mosaic component in the mosaic table alter the query shown above as follows.

Table 3

where Condition:	Numeric attribute name = 0

- Remember that zero may be a valid value for a numeric attribute.

Vegetation polygon – mosaic link:
The mosaic table should contain at least one entry for each vegetation polygon, and every poly_ID listed in the mosaic table should be present in the vegetation polygon table.

Vegetation poly_ID QA:
This procedure will check that every poly_ID in the vegetation table has a corresponding entry in the mosaic table and vice versa.

Firstly the check is done for the vegetation table:

- Run *Query > SQL Select...* and fill the dialog box out as follows, text in italics needs to be replaced with a table or column name.

Table 4

Dialog component	Text to enter
Select:	*
From Tables:	Insert vegetation table name here
where Condition:	poly_ID not in (select poly_ID from mosaic table name)
Group by Columns:	
Order by Columns:	
into Table Named:	Poly_ID_not_in_mosaic

- Tick the Browse Results box to view the output, and click Ok to run the query.
- If any records are selected, then these will be vegetation table poly_IDs that don't have a corresponding entry in the mosaic table.

Now the same check, but for the mosaic table:

- Run *Query > SQL Select...* and fill the dialog box out as follows, text in italics needs to be replaced with a table or column name. nisi.

Table 5

Dialog component	Text to enter
Select:	*
From Tables:	Insert mosaic table name here
where Condition:	poly_ID not in (select poly_ID from vegetation table name)
Group by Columns:	poly_ID
Order by Columns:	
into Table Named:	Poly_ID_not_in_vegetation

- Tick the Browse Results box to view the output, and click Ok to run the query.
- If any records are selected, then these will be mosaic table poly_IDs that don't have a corresponding entry in the vegetation table.

Mosaics sum to 100%:
The mosaic table records the vegetation types and their percentage cover that comprise a mosaic. For a given vegetation polygon, the sum of all the percentage cover values should equal 100.

Mosaic sum QA:
This procedure will calculate the sum of the percentage values for each poly_ID value in the mosaic table.

- Run *Query > SQL Select...* and fill the dialog box out as follows, text in italics needs to be replaced with a table or column name.

Table 6

Dialog component	Text to enter
Select:	Poly_ID , Sum(Percentage)
From Tables:	Insert mosaic table name here
where Condition:	

Group by Columns:	Poly_ID
Order by Columns:	1
into Table Named:	Percentage_sum_check

- Tick the Browse Results box to view the output, and click Ok to run the query.
- Scroll to the top and bottom of the browser window that opens to see if any poly_IDs have a percentage total greater or less than 100.

Map data

Object types:

Each inventory table should only contain one type of object, such as region, point or line. The object type of the table will be stated in the table specification.

Object type QA:

Running the following query will list all the object types in a table, allowing incorrect ones to be spotted and checked.

- Run *Query* > *SQL Select...* and fill the dialog box out as follows, text in italics needs to be replaced with a table or column name.

Table 7

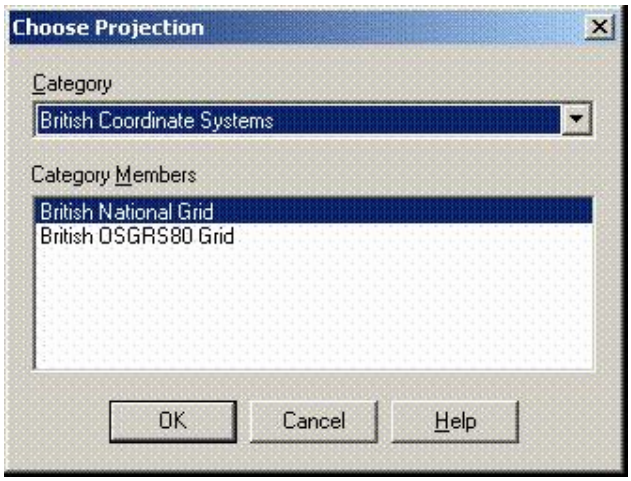
Dialog component	Text to enter
Select:	obj
From Tables:	Insert table name here
Where Condition:	
Group by Columns:	
Order by Columns:	1
into Table Named:	Object_type_check

- Tick the Browse Results box to view the output, and click Ok to run the query.
- Scroll though the browser to check that only objects of the appropriate type are present.

Coordinate system:

All the MapInfo tables should use the Ordnance Survey National Grid to store spatial information.

This coordinate system is listed as 'British Coordinate Systems – British National Grid' in MapInfo. The coordinate system should be specified at the time of creation of a table. In MapInfo v7.0 and above, a default coordinate system for new tables can be set in the MapInfo preferences.



MapInfo Projection dialog showing Ordnance Survey National Grid selected

Coordinate system QA:

This process will show the coordinate system of a table.

- Open the table to check, and run the following menu command *Table* > *Maintenance* > *Table Structure...*
- In the dialog that appears, choose the table from the list and click Ok. If there is only one table open, then a list will not appear, move to the next step.
- Click the projection button, and the table's coordinate system will be shown.

Mapping precision / scale:

The Inventory is to be created using the Ordnance Survey Mastermap dataset as the topographic reference. For coastal areas, the scale of mapping for the Mastermap dataset will be 1:2500 or larger, and the inventory should match this.

Digitising, including heads-up digitising, where data is traced from a scanned image displayed in the GIS, should be performed at a screen scale of 1:2500 (1cm = 0.025km), or larger if

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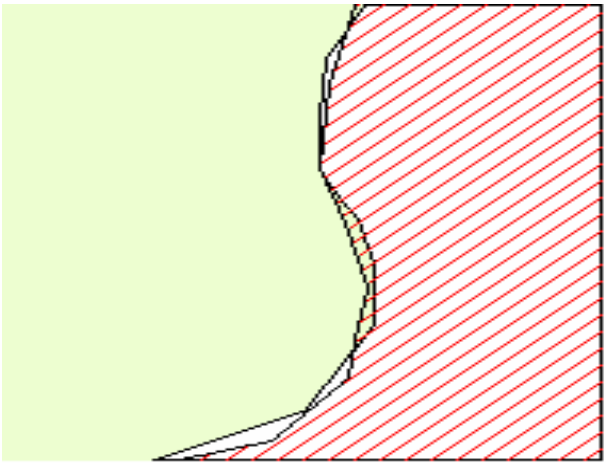
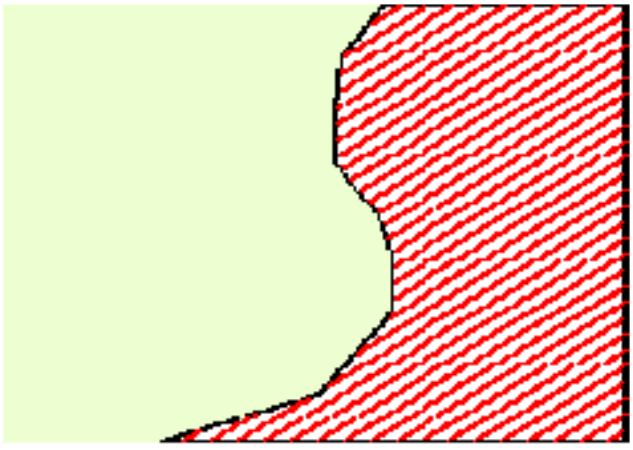
necessary to ensure that all map features are clearly distinguishable. This should ensure that the data is captured to the required precision, and also display sufficient detail to reduce digitising errors.

Polygon snapping:

Snapping is the ability of a GIS to exactly reuse the coordinates of an existing object when digitising a new object. Snapping is required whilst digitising Inventory data to ensure that it exactly matches the Ordnance Survey Mastermap data where appropriate (eg where a vegetation polygon is bounded by a wall). Snapping is also used to ensure that adjacent inventory polygons have the same boundary:



Unsnapped boundaries



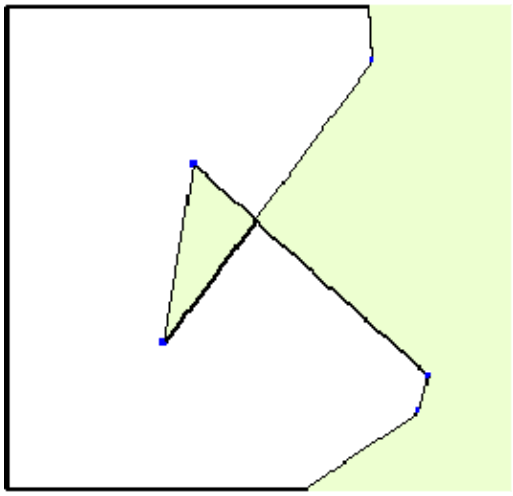
Snapped boundaries

Unsnapped data can create overlaps or gaps between adjacent polygons, as shown in Figure G. These are not acceptable. Where an overlap is intentional (eg the extent of a recent landslip overlaps more than one vegetation polygon) one set of polygons will need to be placed into a separate table, and this should be discussed with the Natural England project officer before continuing.

MapInfo augments the snapping function by allowing the tracing of sections of existing data in a single operation. This should be used wherever possible.

Snapping QA:

This process will highlight overlaps and gaps caused by adjacent polygons not being snapped together correctly. The check will also highlight self-intersections, which can be a product of poor quality digitising.



A self intersecting polygon

- Open a map window showing the table to check.
- Select all the objects in the table to check.
- Make the cosmetic layer editable.
- Run the menu command *Objects* > *Check Regions...* the following dialog will appear:

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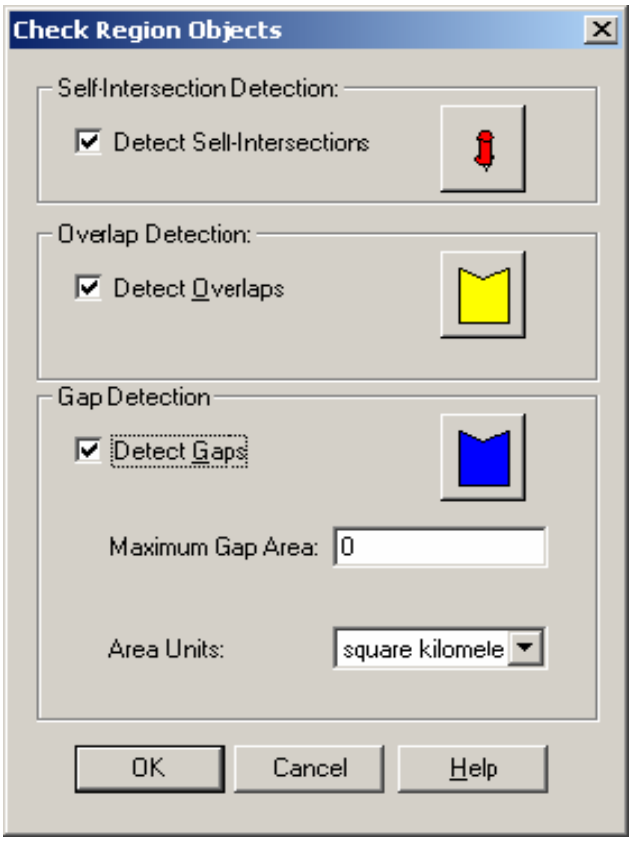

Check Regions dialog

- Check all the boxes as shown in Figure and click Ok. If there are no problems with the data, then a message will be displayed stating this, otherwise, MapInfo will insert objects in the Cosmetic layer corresponding to overlaps, gaps and self-intersections in the data.
- Save the problem objects in the cosmetic layer to a table using the *Map* > *Save Cosmetic Objects...*
- Use the *Query* > *Find* Selection method with the problem objects table to check and remedy each problem in turn.

Further information

This leaflet was developed as part of the work on NERR003 *Maritime Cliff and Slope Inventory 2004/2005*. written by C.T. Hill, R.H.E. Downes, and A.J.P. Harfoot of the GeoData Institute, University of Southampton, Southampton, SO17 1BJ, **www.geodata.soton.ac.uk**

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