

FOREST RESEARCH

Standard Operating Procedure

SOP Ref No: SOP0555 (NIWT2 version)

References:

Key Words: Interpreted Forest Type, digital woodland map, woodland inventory, woodland survey, Interpreted Open Areas.

Category: Technique

Title: Creating and Maintaining the Great Britain digital woodland map for woodland inventories and surveys.

Scope: This SOP describes the method of data capture to be used to create and maintain a digital woodland map for large-scale inventories and surveys.

This encompasses rule definitions for data capture using;

- a) Colour aerial ortho-photographic imagery, where available for the external woodland boundary and the internal feature type boundaries.
- b) The photographic images will be no older than 3 years at the time of creating the digital map (i.e. areas to be created in 2007 will use photographs that were ideally taken no earlier than 2004). As the map will be the basis for a longer rolling programme of sample field surveys it will be necessary to develop procedures to update the map to the date of the field survey.
- c) There may also be a user demand for releasing an updated map (as was delivered for National Inventory of Woodland and Trees (NIWT1)). These updates will be achieved by using aerial photography that becomes available later. See **Maintenance** section and APPENDIX 4.
- d) Airborne Interferometric SAR imagery for the Interpretation of the external woodland boundary in areas where the above colour imagery is unavailable. Note: It is difficult to allocate an Interpreted Forest Type (IFT) from radar imagery to low growth forest types unless the trees are well established providing good canopy definition.
- e) Ordnance Survey MasterMap® (OSMM) features. OSMM is the most up to date large-scale digital map of GB providing a seamless database for 1:1250, 1:2500 and 1:10000 survey data.

All woodland (both urban and rural, regardless of ownership) which is 0.5ha or greater in extent will be mapped – see APPENDIX 1 for definition of woodland.

Woodland that is less than 0.5ha in extent will not be described here but will be included in a separate sample survey of small woodland and tree features.

This SOP assumes prior GIS competence (does not describe the opening of GIS, creation and editing of polygons etc. in GIS) in the use of Forestry Commission (FC) Corporate ESRI GIS software and any relevant GIS extensions.

This SOP was primarily written for the creation of NIWT2 GB woodland map, but can also be used for other large-scale woodland inventories and surveys.

Amendments: May 2007, November 2007, January 2008.

Background: A paper on the creation of a Great Britain Woodland Map for use within the FC is currently under discussion.

The main recommendations in the paper are;

- where possible the FC adopts common standards when mapping woodland.
- adoption of common data capture standards across NIWT, Native Woodland Survey of Scotland (NWSS), Woodland Grant Scheme (WGS), Deeds and Sub Compartment Data Base (SCDB) will begin to bring these key FC woodland data sets into closer alignment.

The recommendations made in the above paper represent first steps down a process that should eventually see the FC reap the benefits of adopting common woodland data capture standards.

One of the primary objectives of the NIWT2 survey is to produce an updated map of woodland in Great Britain, regardless of ownership, using OS MasterMap® features as boundaries where appropriate by capturing IFTs – see APPENDIX 2 for details of IFTs. Woodlands will be divided up according to their IFT as long as these smaller divisions meet the criteria set out in APPENDIX 1.

The FC woodland data will better fit with other rural land-use datasets such as the agricultural Integrated Administration and Control System (IACS) and the Ancient Woodland Inventory (AWI).

Primarily, colour OS and Welsh Assembly (2006 40cm resolution) aerial ortho-photography will be used for the data capture of IFT's across Great Britain. However, colour aerial ortho-photography is not available for the whole of Britain, therefore interpretation may be based on a mixture of available colour aerial imagery and SAR (referred to as radar imagery), which is readily available for Great Britain.

The NIWT1 woodland (for 2 ha and over) map has been updated for WGS and SCDB boundary data with a reference date of 31 March 2002.

Method: The following protocol will be followed during the interpretation and data capture stages - see APPENDIX 4, Showing the Flow Chart for Creating, Quality Control and Updating the Woodland Map.

The process of creating the woodland map is a visual exercise of interpretation of digital aerial images to depict firstly the woodland edge, then the internal main forest types within woodland and interpreted open areas (IOA's) completely enclosed by woodland.

The object is to map all the woodland IFT/IOA areas as seen within the image tiles. Features that may appear to straddle a tile edge, even small areas < 0.5 ha at the tile edge must be included in the data capture. These smaller areas < 0.5 ha at the tile edge may join onto larger woodland/features on the adjoining image to make an area of 0.5 and over. The woodland features that straddle a tile edge should be closed/stopped along an image tile boundary.

See APPENDIX 2 for the definition of woodland and capture rules, relating to which vectors will be captured, when to incorporate necks of woodland and holes in woodland etc.

APPENDIX 5 Shows the decision making matrix for the creation of the woodland IFT and IOA map.

(Note: Interpreters will decide whether to carry out Stage 1 and 2 below simultaneously for woodland map creation)

Stage 1.

The first visual action is to identify woodland with at least 20% canopy cover or scrubby vegetation which has an area extent of 0.5 ha or greater. The identified woodland could be a single IFT or consist of multiple IFT's.

The interpreter will work around the orthorectified imagery, capturing the IFT woodland boundary(s) and using other digital datasets as reference, primarily OSMM. In addition to OSMM, the OS 1:10000 maps and on occasions the existing NIWT1 map (updated to 31:03:02) will be used for an indication of woodland existence. Also see **Maintenance** section.

- a) Where the MasterMap boundary is coincident with the external/IFT edge of woodland boundary as depicted on the aerial image and within 10 meters of the perceived edge, then the OSMM boundary **will be** followed. See Rule 1 example 1
- b) Otherwise where a woodland boundary or IFT feature deviates by more than 10m from the OSMM feature, then interpret and digitise as a discrete boundary feature from the aerial image on PC screen. See Rule 1 example 2
- c) Area features will always be closed polygons.
- d) Data must be supplied using OS GB National Grid, Transverse Mercator projection.

Stage 2.

The interpreter is required to capture the boundaries of Non woodland areas [Interpreted Open Areas (IOA's)] which are equal or greater than 0.5 ha in extent, following the above guidelines from the imagery where the boundaries are clearly distinguishable – see APPENDIX 2 for definitions and APPENDIX 6 for image (updated imagery will be provided separately on CD-ROM) examples.

- a) IOAs must be enclosed by woodland.
- b) Note: the OSMM data set does not necessarily show all internal woodland boundaries coincident with IFT's. Where this is the case the interpreter will then interpret and digitise a discrete boundary feature from the image on PC screen.
- c) The abbreviated codes for IFT and IOA as described in APPENDIX 2 are then added to each polygon as an attribute, see APPENDIX 3.
- d) If a woodland IFT /IOA of < 0.5 ha appear to extend beyond the tile edge (i.e. the extent of the working image area) then it requires the attribute 'Sheetedge', see APPENDIX 3.

Stage 3.

Interpreters will carry out the following Quality Control checks before submitting the woodland map to GIS Inventory Officers for Quality Assurance.

- all woodland and internal spaces of a stand alone size of 0.5 ha or greater have been captured;
- appropriate IFT/IOA attribute codes have been assigned.
- the most appropriate available boundary has been used.
- if woodland features appear to extend beyond the tile edge, then close woodland IFT/IOA along tile boundary.
- check the map topology (eliminating overlapping polygons, slithers between polygons etc.) and clean the digital data where required.

When capturing data on screen, against the OSMM, a suitable scale will be used for boundary interpretation and snapping, e.g. a scale of no less than 1:2500 is used to digitise 1:10000 data. Although, it may be necessary to zoom in further if it is not clear which features boundaries are meant to follow.

Stage 4.

Quality Assurance of the Digital Woodland Map Creation

The acceptance process is led by FR Woodland Surveys Team to ensure all submissions meet a minimum quality standard.

The digital woodland map is received by FR Woodland Surveys in a format specified for each contractor (normally via e-mail attachment, but could be CD or DVD etc.). The data will be submitted in multiples of 10 x 10km tiles, referred to as Work Allocation Units (WAU's).

1. Import the data file(s), if unsuccessful, then return to sender.
2. Makes a copy of the imported file for checking and editing, name edit file (****_QA, and subsequently _QA2 etc. as a standard file name).
3. Check that the topology of the original map is acceptable and note the number of errors (mark non-errors as exceptions but do not edit actual errors).
4. Check that all Woodland and NWSS Linear Tree Features (LTF's) have appropriate attributes attached. See Appendix 3

The data received will be loaded and viewed against the:

- aerial imagery
- Mastermap and
- Supplementary reference layers used to create the map.

In each WAU tile a minimum of 20 randomly selected 1km² (equates to 10% of the area) will be viewed against the reference data.

5. Use the 1 km grid tool to generate the random selected 1 x 1 km sample squares.
6. Check the overall woodland shapes against OSMM and Imagery (*note differences – suggested count by use of ‘gate’ system to later record in Scoring Matrix, see Appendix 7*)
7. Carry out a general look over the whole tile, but within each 1 x 1km QA tile the reviewer will look for :
 - anomalies in the capture of Woodland areas and Linear Features.
 - the appropriate attribution has been assigned to the IFTs/IOA’s.
 - the most appropriate woodland boundary has been used.
 - the map topology is acceptable.
8. Ensure that the topology of the edited file is correct.
9. Overlay the edit file with the original imported file and record differences, where the reviewer will use a score sheet to determine the extent of any errors in the submission. Example for England and Wales is attached in Appendix 7.

If the total score for the process is greater than or equal to 200 the submission will be returned to the supplier with a report and visual examples of the areas where the quality was below standard. This will be reported in the categories identified in the score sheet.

If the total score is less than 200, the reviewer will make any changes identified as necessary and scan the remaining sections of the WAU tile for similar errors, correcting as progressing through the area. Where necessary a report with visual examples of the corrections required will be sent to the supplier to update training and improve their own QA process.

Note:

1. **Within** the QA'd area where there are errors on the map Woodland Surveys will amend these errors *EXCEPT* when it is seen that the tile is going to fail the QA process (score >1000) in which case the tile will be returned to the contractor for corrections.
2. **Outwith** the QA area only mistakes effecting the NIWT2 map will be corrected. No Linear Features or polygons <0.5ha are to be corrected outside the QA area.

Reviewers should note any IFT areas of Cloud / Shadow (CS) and Uncertain (X) for further investigation see under Validation.

Maintenance: Updating the woodland map will be achieved by using the latest aerial imagery that is made available on the Spatial Data Repository after the initial creation of the woodland map and/or FC administrative data on new woodland planting.

The latest WGS and SCDB boundary data will be accessed by GIS Inventory Officers as part of the woodland update procedures when mapping work is produced outwith the FC. However internal interpreters may be able to access latest WGS and SCDB boundary data via network connections and access to 'FORESTER 3' in order to incorporate this new planting data into the map.

Calibration: During the field survey part of NIWT2 and NWSS, forest surveyors will be required to check the accuracy of IFT's as they walk to locate and survey 1ha sample squares and potential Native Woodland. Note: This will only be a small partial check of the IFT's within the GB map data

Information received from the field will be passed back to GIS Inventory Officers to validate against the OS imagery and adjust a sample of IFT boundaries accordingly.

Selected field anomalies of IFT and IOA's will be used to build up a library of aerial woodland images to assist interpreters. See APPENDIX 6 (updated imagery will be provided separately on CD-ROM)

Interpreters will make use of the measuring facility tool within GIS to accurately measure 10 or 20m etc. Similarly, once a small IFT is digitised as a complete polygon, then calculate the area > 0.5 ha in GIS to see if the IFT should be part of the woodland map.

Percentage grids will be made available to assess the various percentage (20, 50 – 80 and 80%) canopy covers.

Validation: A set of capture rules (see APPENDIX 2) and processes have been laid down and evolved both through development of this project and 'The Great Britain NIWT1 Methodology of the survey 1995 –1999'.

Any IFT areas allocated 'CS' or 'X' these will require further investigation. First check to see if 'CS' or 'X' falls on FC land, if so then access SCDB to aid identification. X IFT's may be resolved by discussing with QA colleagues.

Any remaining IFT areas of CS and X, could be resolved by ground verification during fieldwork or obtaining new or additional imagery.

Further validation and maintenance of this procedure will be ensured by:

Forest surveyors (during the field survey of NIWT2 and NWSS) will be asked to check the accuracy of IFT's during the field exercise, walking to locate and survey 1ha sample squares and potential Native Woodland, then report back to GIS Inventory Officers any discrepancies between the imagery and actual woodland details.

GIS Inventory Officers will validate field information against the OS imagery and adjust small sample of IFT boundaries accordingly.

Initially the GIS Inventory Officer will carry out independent verification of woodland mapping by thoroughly checking and recording anomalies from the first two woodland areas submitted by all operators. It is expected that

the number of areas for verification will reduce over time as operators become more experienced in mapping data capture. However, there will always be a minimum level of QC throughout the mapping exercise (approximately 10% of the mapped area).

The verification involves visual scanning of the full interpreted extent to confirm map details – see Method section stage 3.

**Operator
Competence:**

Currently the interpreter competence will be based on completion of the woodland map for two test areas, taken from an upland area of Scotland (Caledonian pine etc.) and a lowland area in Scotland (mixed woodland etc.).

The aerial interpretation is not an exact science (relies on individual observation of aerial imagery), but interpreters will be expected to capture and add attributes to “95% of the map coverage” of IFT’s and IOA’s compared with the GIS Inventory Officer version.

Within the FC, additional training will be provided to interpreters, to work on selected existing woodland map areas that have been through quality control procedures.

Training courses for FR staff will be recorded in the personal development section of the FJP and will be submitted to Alice Holt by May 31st each year.

After the satisfactory completion of two test areas, the interpreter will be signed off as being competent by the supervisor.

Bibliography:

1. Steve Smith, Simon Gillam, Graham Bull, Justin Gilbert and Esther Whitton, July 2006, currently in final draft, ‘The Great Britain NIWT1 Methodology of the survey 1995 –1999’ document will provide background to the first NIWT survey.
2. Graham Cullen, Ian Macleod and Graham Bull, July 2006, Proposals For The Creation Of The Great Britain Woodland Map For Use Within The Forestry Commission.

**Health and
Safety:**

Whilst carrying out this procedure, every hour operators must take a minimum five minute break away from their workstation / computer to give their eyes, wrist and hand a rest.

Visual Display Unit / Computer work station assessment.

List of referenced SOPs:

SOP Number	Full title

Written By: Esther Whitton
Date: July 2006, Modified November 2007, February 2008
Agreed By:
Date:
Referee: Graham Bull
Date: July 2006
Principal Statistician approval:
Date:
Approved:
Date:

APPENDIX 1 DEFINITION OF WOODLAND AND RULES TO FOLLOW

DEFINITION OF WOODLAND

For the purpose of this mapping exercise ‘woodland’ is defined as land with:

Canopy cover: The land must have either $\geq 20\%$ tree canopy cover or *the potential* to achieve $\geq 20\%$ canopy cover (e.g. new plantings and/or areas of natural regeneration). Areas of young trees, which have the potential to achieve a canopy cover of more than 20%, will be interpreted as woodland and mapped.

Area: A minimum area of 0.5 ha under stands of trees with, or with the potential to achieve, tree crown cover of $\geq 20\%$ of the ground. A minimum area of 0.5 ha will be mapped for open areas where the space is surrounded by canopy cover as defined above.

Width: The minimum width for woodland is 20 m, although where a woodland includes a narrow neck of woodland less than 20 m wide, the neck may be included if less than 20 m in distance between woodlands – see rule 3 page 11 for more detail. Note: No minimum IFT/IOA width.

Roads, rivers, etc:

- Roads – sealed ‘non-forest’ roads* regardless of width will not be included in the woodland.
- Railways – normal gauge railways will not be included in the woodland.
- Rivers, rides, power lines, etc – these will be mapped out only when the feature (e.g. river) is visibly ≥ 20 m wide **and** ≥ 0.5 ha in area. Part of river features could be excluded, while other parts of the same feature are included.

"Scrubby vegetation" is included within this survey where low woody growth seems to dominate a likely woodland site.

Orchards and species such as rhododendron and gorse (where identifiable) are not regarded as woodland and will therefore be excluded from this data set.

* The aim will be to exclude roads that cut through woodland rather than being an integral part of it. In general this means that sealed (tarmac or concrete) roads and all public roads will not be included in the digitised woodland boundary.

RULES TO FOLLOW WHEN DIGITISING WOODLAND FEATURES

Rule 1: Where a line is shown on MasterMap® to be within 10 m of the perceived woodland edge, IFT or IOA boundary (and of the same trend), then that line **will be** used. Where the boundary is different, it needs to be captured by digitising along its edge – the boundary line will be drawn approximately where the tree stems are and not along the canopy edge. This capture rule requires that odd trees and thin bands or gaps which cause a slight difference get ignored.

(Note 1: Smaller woodland parcels, groups, < 20 m width linear features and single trees outside woodland will be included in a separate sample survey).

Example 1: The figure below shows the woodland/IFT/IOA boundary is within 10 m of an existing MasterMap® line. In this example the boundary is snapped to the MasterMap® line.

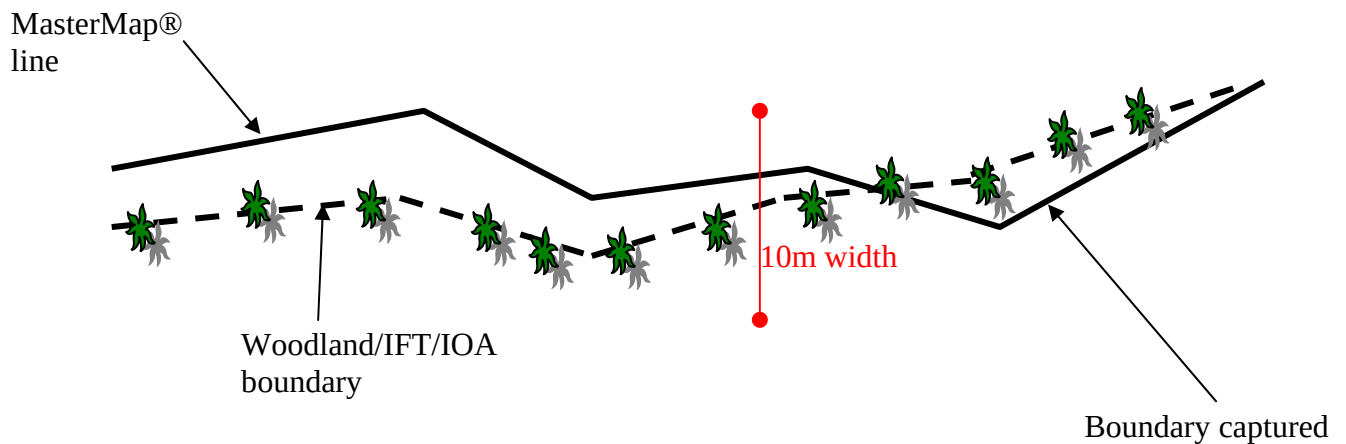


Figure 1

Example 2: The woodland boundary is > 10 m and/or crosses over the line in such a way as to give a completely different shape from the MasterMap® line therefore the woodland boundary is not snapped to MasterMap®.

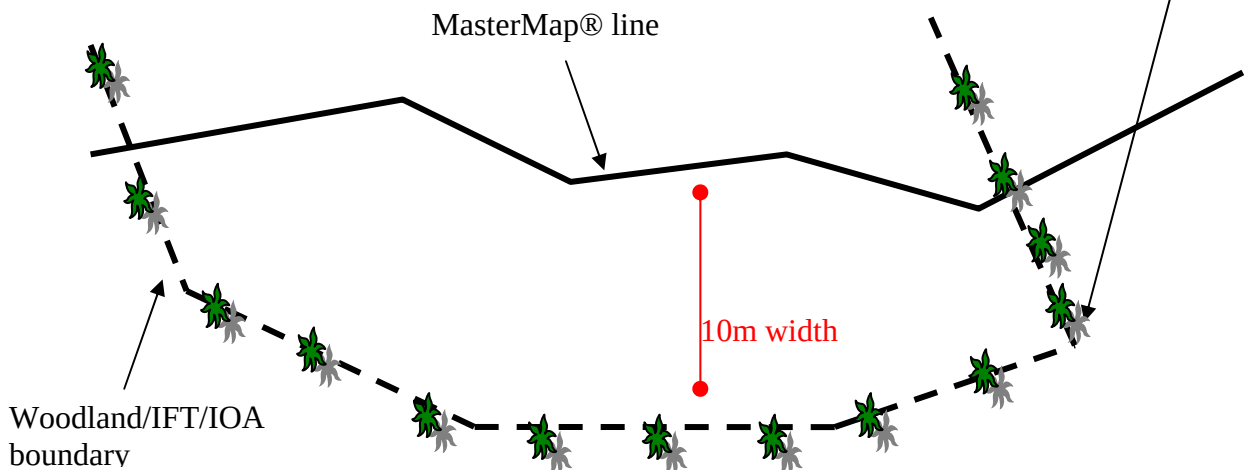
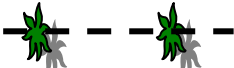


Figure 2

Where:  = MasterMap® line
 = Woodland/IFT/IOA boundary

Rule 2 (Fingers of woodland): Fingers or bands of woodland need to be at least 20 m wide in order to be considered except where they form a bridge between woodland blocks and are less than 20 m in length (see Rule 3).

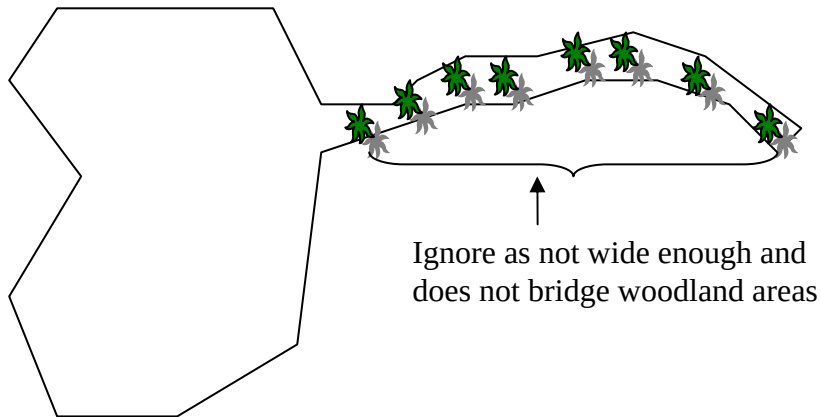


Figure 3

Rule 3: Where a small and continuous section or narrow neck within a larger block retains a woodland character below the 20 m width threshold, but is also < 20 m in length (giving a shape akin to an hourglass), then their capture is acceptable.

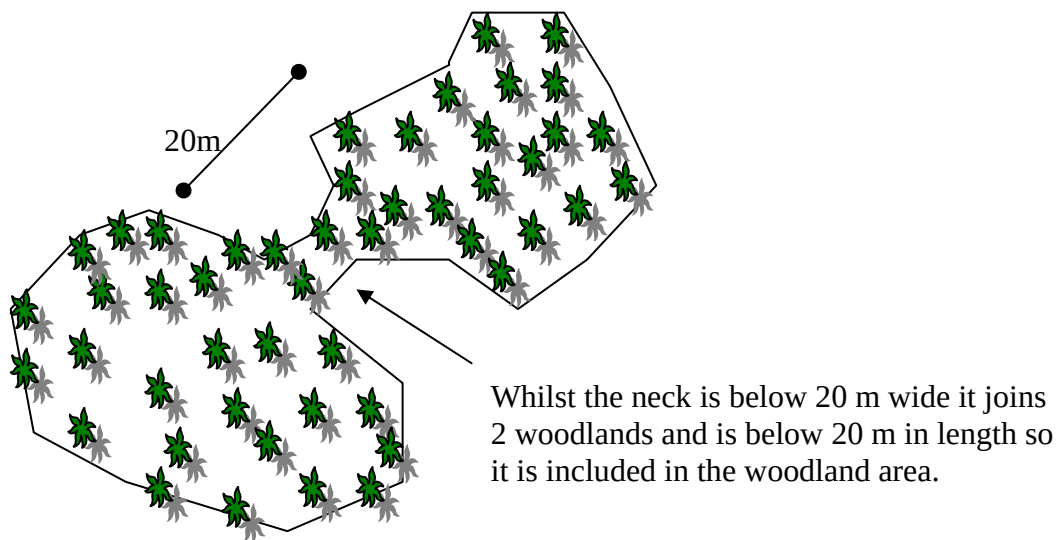
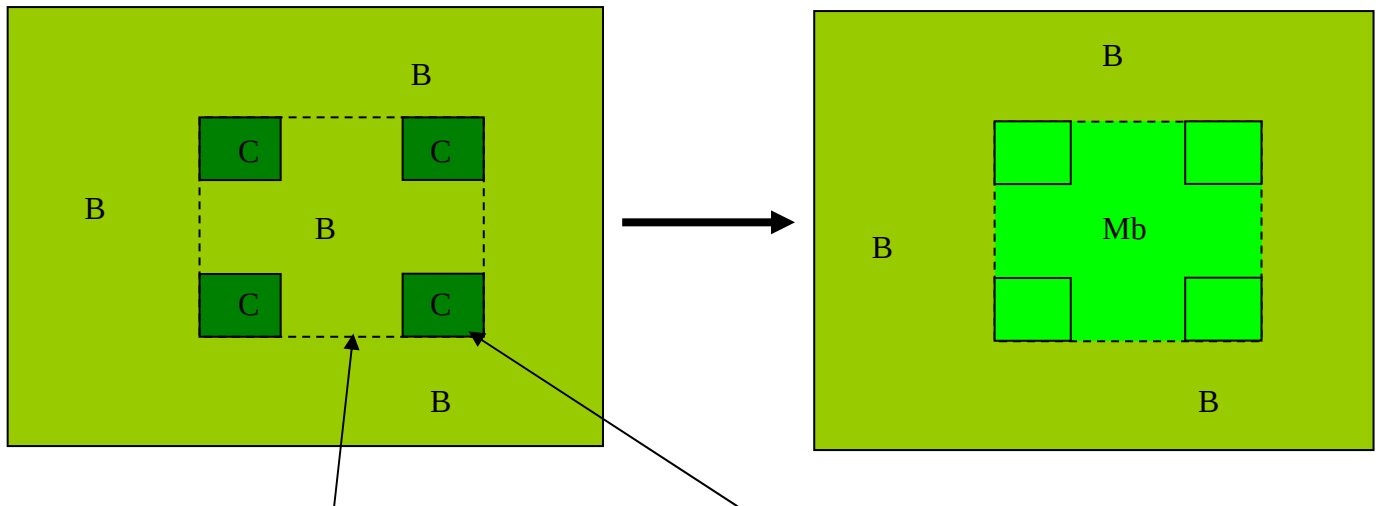


Figure 4

Rule 4 (IFTs): When capturing mixed woodland made up of individual blocks of a less dominant type within a “matrix” of a more dominant type, where possible, the edges of the less dominant type will be followed. For example the 4 Coniferous blocks below are each less than 0.5 ha so cannot be mapped as independent IFTs. However, within the pecked boundary the IFT will be designated as Mixed Predominantly Broadleaved with the outer area being classified as Broadleaved.



Designate the area outside pecked boundary as pure broadleaved and all areas inside as Mixed Predominantly Broadleaved

NB: Blocks of C are each less than 0.5 ha in size

Where:



= Broadleaved



= Mixed Predominantly broadleaved



= Conifer

Figure 5

APPENDIX 2

INTERPRETED FOREST TYPES (IFT's) AND INTERPRETED OPEN AREAS (IOA's)

Within each woodland, internal parcels (polygon) with a minimum area of 0.5 hectare will be classified as one of the following. Conifer, Broadleaved, Mixed (predominantly conifer), Mixed (predominantly broadleaved), Coppice, Coppice with standards, Shrub, Young Trees, Felled and Ground prepared for planting each consisting of an area of a single interpreted forest type as defined in the table below. Note that "Scrubby vegetation" is included within this technique according to its interpreted type (e.g. Conifer, Broadleaf, Mixed); or if the area is not easily differentiated in this way, it will be classified as 'shrub land' where low woody growth seems (or appears) to dominate a likely woodland site.

Table 1: IFT codes to be used and brief descriptions – also see APPENDIX 6 for imagery examples of IFT and IOA's (updated imagery will be provided separately on CD-ROM)

As part of the QC system all areas designated with an 'X' will be checked by GIS Inventory Officers.

Abbreviation code	Description text	Comments
C	Conifer	Coniferous woodland often occurs as large plantations with trees in regular rows and the stand edges may be regular and sharply defined. Some broadleaved trees may also be present but greater than 80% of the area will consist of conifers.
B	Broadleaved	The canopy of broadleaved woodland is generally more uneven than that of coniferous woodland being made up of rounded crowns but with variations according to species, age, height, and season. Boundaries with adjacent internal polygons are generally less clearly defined than with conifers and naturally occurring stands may grade into adjacent ones with no sharp division. Some coniferous trees may be present but greater than 80% of the area will consist of broadleaved trees.
Mc	Mixed Predominantly Conifer	Mixed woodland exhibits intermediate characteristics between Conifer and Broadleaved woodland. There can be several types of mixed woodland. A plantation of alternate rows of conifer and broadleaves may produce a 'striped' appearance. You may see conifer and broadleaves planted in blocks, and there may be general intersperse woodland. The proportion of the Conifer will be more than 50% of the area and less than 80%.
Mb	Mixed Predominantly Broadleaved	Mixed woodland exhibits intermediate characteristics between Conifer and Broadleaved woodland. There can be several types of mixed woodland. A plantation of alternate rows of conifer and broadleaves may produce a 'striped' appearance. You may see conifer and broadleaves planted in blocks, and there may be general intersperse woodland. The proportion of the Broadleaves will be more than 50% of the area and less than 80%.
O	Coppice	The most important characteristic of coppice areas on aerial photographs is its very even, smooth appearance. The coppice area may be made up of a patchwork of different ages (heights) but all show this very even character. Areas recently

		cut may appear to have a very clear floor with little felling debris. Coppice is always of broadleaved trees.
P	Coppice with Standards	Some areas of coppice also include larger broadleaved trees set in the coppice matrix. These broadleaved trees, often oak, are known as standards and show very clearly over the even coppice as large rounded crowns. The distribution of the standards may also be fairly scattered with approximately 25 per ha.
S	Shrub Land	This category is intended to include areas that may possibly be woodland, where the growth is close to the ground and shows a rough character but no clear differentiation between Conifer and Broadleaved can yet be made. Areas being colonised by woody species may fall into this category. The cover will be at least 20%.
N	Young Trees	Areas where planting is clearly visible but the trees cannot yet be allocated between Conifer and Broadleaved due to their immaturity. These areas can be on either land new to woodland or where a felled crop has been replaced.
F	Felled Woodland	Areas of woodland where the trees have been harvested or felled. Stumps or felled trees may be visible and there may be long heaps of felling debris ('windrows'). Some standing trees within this limit may also be present but should be disregarded. This category should not be confused with Coppice. The areas concerned may also have been re-stocked but the new trees are not yet visible.
G	Ground Prepared for New Planting	Very difficult to differentiate from agriculture, but may show plough furrows, spaced earth mounds or weed killed patches or strips as part of a new woodland regime. Likely to be part of an approved grant scheme held on G&L databases.
CS	Cloud or Shadow	If cloud or shadow areas obscure woodland detail and it is difficult to allocate one of the above IFTs, then digitise a new boundary line feature around the area of uncertain forest type.
X	Uncertain	Where the interpreter is uncertain of the IFT/IOA to be used X will be designated. The rate of use of this category should decline over time, as operators become more proficient and better at recognising IFT/IOAs. As part of the QC procedures X's will be checked and operators found using this code frequently will be subject to more intensive QC procedures and possibly more training and reassessment of interpreter competency.

Notes:

Orchards and species such as Gorse and Rhododendron are not regarded as woodland and therefore will be excluded.

If the mixed woodland appears to be split 50% between Conifer and Broadleaved woodland and the interpreter cannot decide whether it is predominantly conifer or broadleaf the IFT 'X' can be used.

Table 2: Interpreted Open Areas (IOAs) – all open areas that are ≥ 20 m wide and ≥ 0.5 ha completely surrounded by woodland IFTs.

Abbreviation code	Description text	Comments
W	Open water	Normally labelled within OSMM, areas of even colour
Gs	Grass	A predominantly grassy area – may be agricultural or not.
A	Agricultural land	May contain a cereal crop or pasture.
U	Urban/Building	Buildings within woodland areas, may include gardens surrounding the building
Ro	Forest road, track	Linear feature, often fairly straight with gentle bends or turning circles.
Ri	River	Linear feature, depending on location can be fairly straight or meander through woodland.
L	Powerline	Linear feature, possible shadow evidence of poles, pylons or even the cable/lines.
Q	Quarry	Show change in vegetation to geology, sand, slate, rock etc. Active quarries could have buildings, heavy plant tracks leading into the quarry.
Ba	Bare	Bare ground/rock
Wf	Windfarm	Possible shadow evidence of turbines, normally in groups
V	Other vegetation	Not covered by the above, e.g. Gorse, Rhododendron, Bracken, Heather etc.

APPENDIX 3

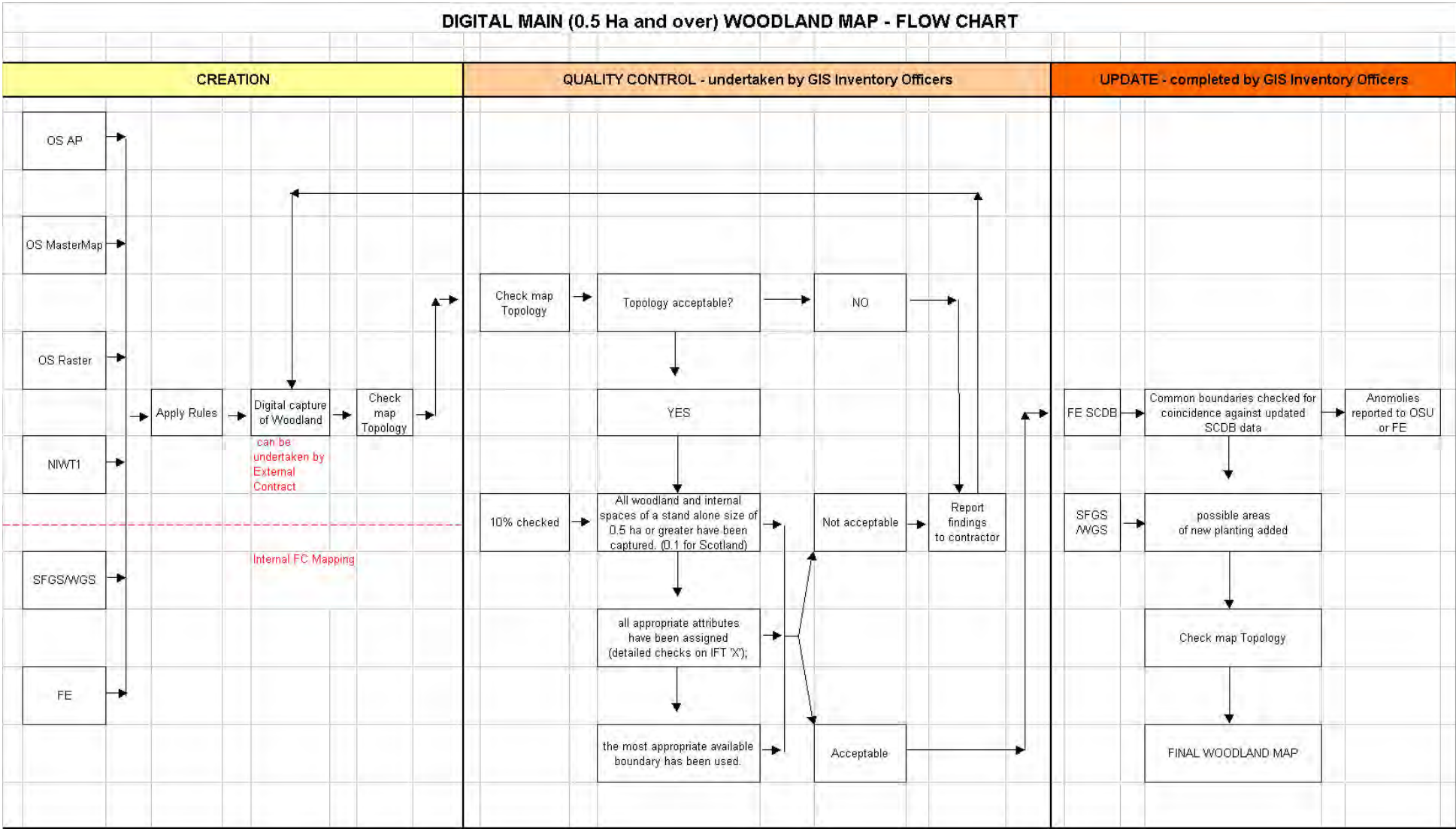
The Woodland map of IFT and IOA's (also to include those features along tile/image edge) will be imported into the Forestry Commission Corporate (ESRI ArcGIS) software.

Specified attributes should be added to Interpreted Forest Types and Interpreted Open Areas as below.

Woodland Map Attributes

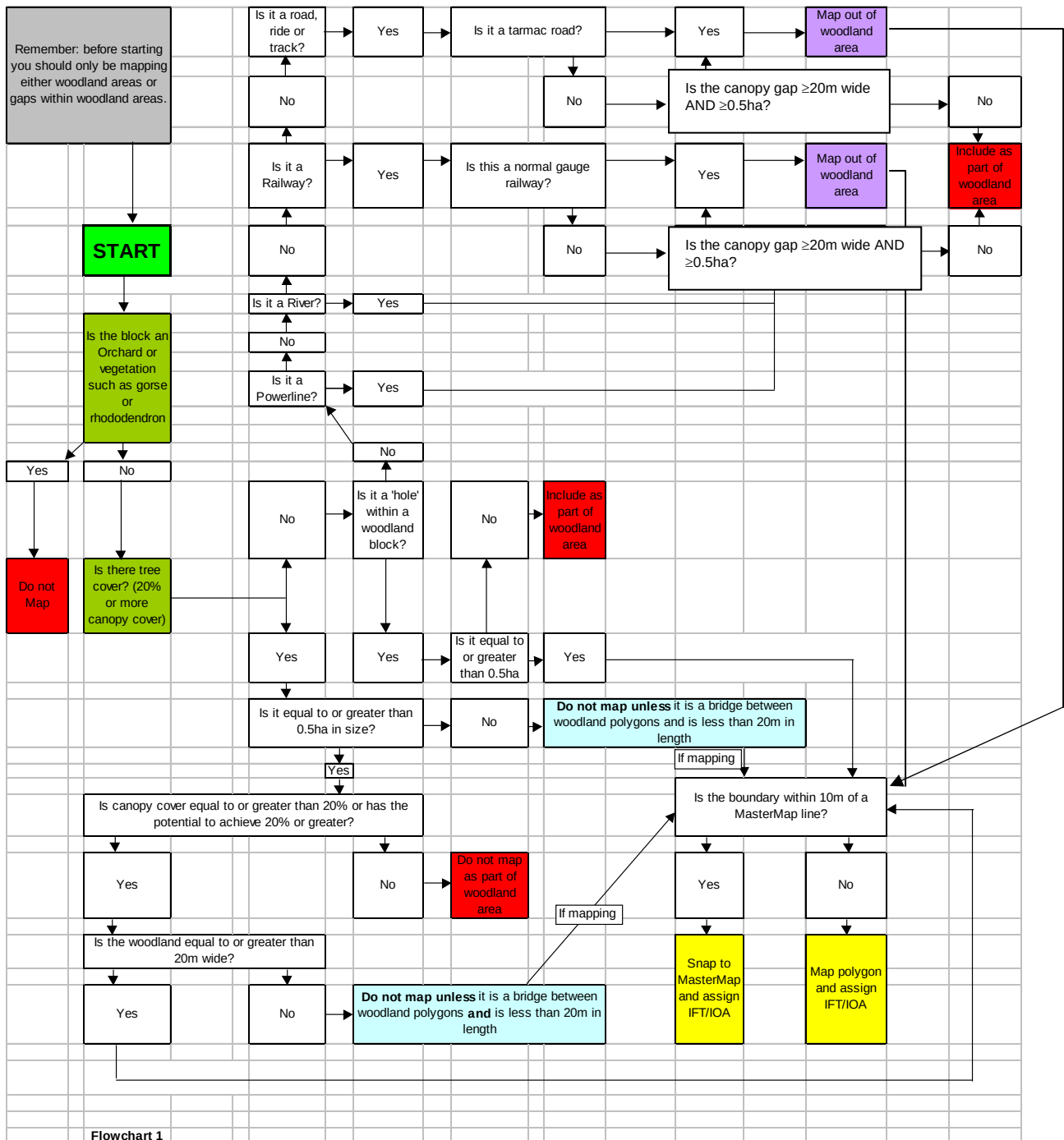
Name	Type	Length	Description	Domain
IFT	Text	10	Interpreted Forest Type	C, B, Mc, Mb, O, P, S, N, F, G, CS, X.
IOA	Text	12	Interpreted Open Area	W, Gs, A, U, Ro, Ri, L, Q, Ba, Wf, V.
Less0_5	Text	12	IFT/IOA, Sheetedge identifier of features <0.5 ha	C, B, Mc, Mb, O, P, S, N, F, G, CS, X. W, Gs, A, U, Ro, Ri, L, Q, Ba, Wf, V. Sheetedge
Hectares	Double Precision	10 Scale 2	Area of Feature in hectares	

APPENDIX 4.



APPENDIX 5

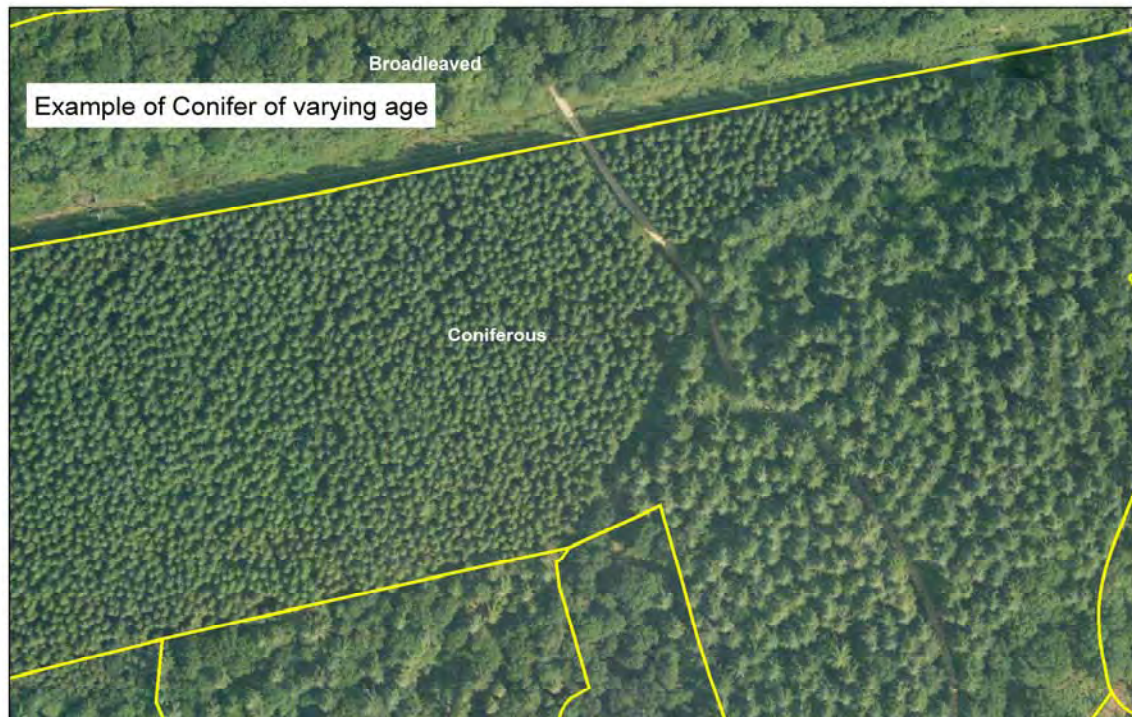
Flow Chart 2. Shows the decision making matrix for the capture of woodland areas, their IFT's, the non-woodland areas to be captured and their IOA's.



APPENDIX 6

EXAMPLES OF AERIAL IMAGERY SHOWING INTERPRETED FOREST TYPES AND INTERPRETED OPEN AREAS – Note: headings in *italics* indicate where images still have to be added, work in progress.

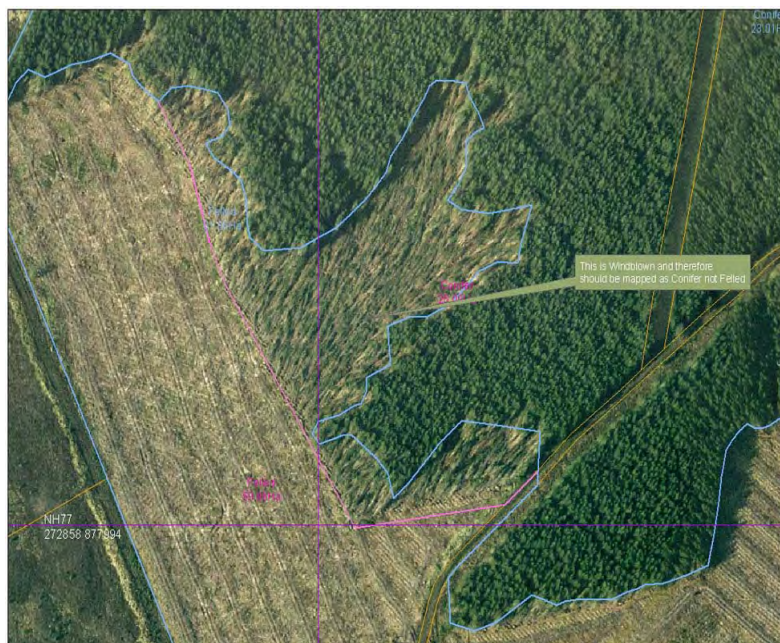
CONIFER



CONIFER (cont.)



Conifer Windblown – IFT C



BROADLEAVED



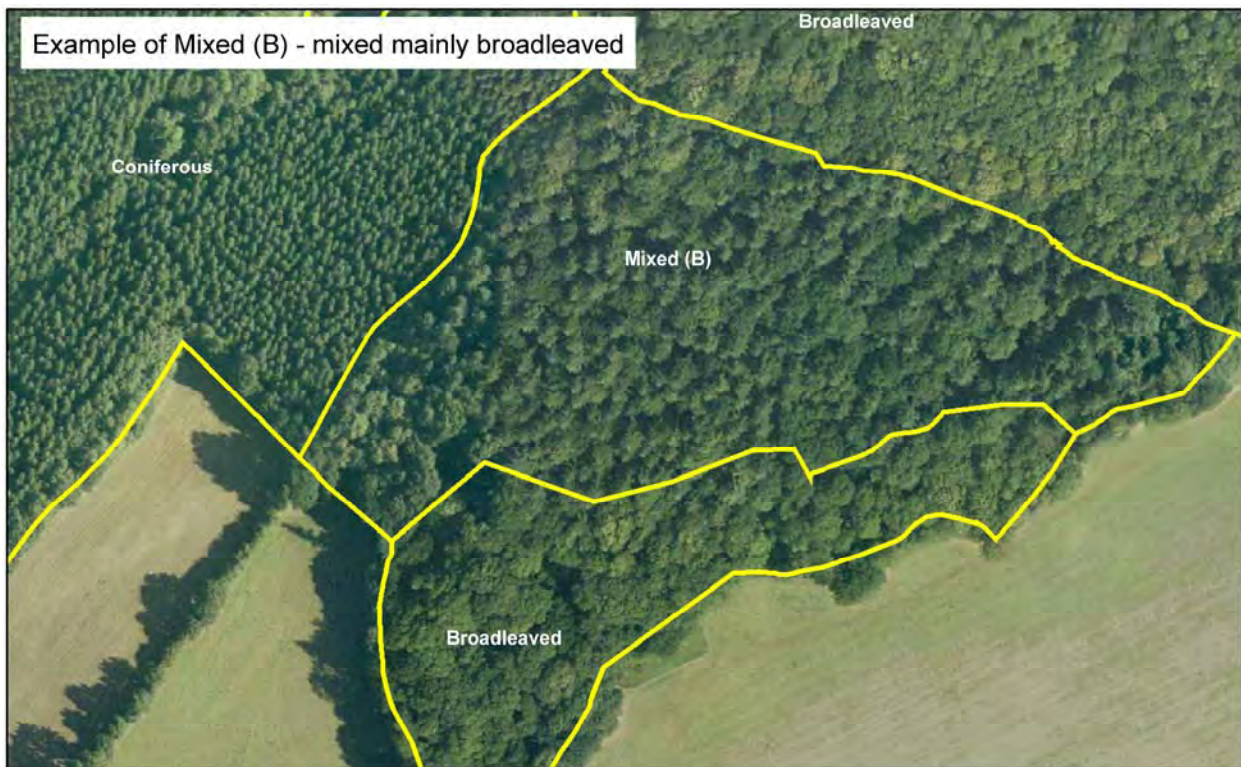
Ground view of Broadleaved IFT

MIXED PREDOMINANTLY CONIFER



Example of Mixed Predominantly Conifer

MIXED PREDOMINANTLY BROADLEAVED



Ground view Mixed Predominantly Broadleaved

COPPICE/ COPPICE WITH STANDARDS



Coppice of varying age





Ground view examples of Coppice



SHRUB



YOUNG TREES



Example of Young trees.
The image on the left shows API with a SFGS
(Grant Scheme) shown in red hatch.
Below is a ground view of the site.



YOUNG TREES (cont.)



Example of scattered young trees above (API) below (ground view)



FELLED



GROUND PREPARED FOR PLANTING



CLOUD, SHADOW or SMOKE



Examples of Interpreted Open Areas

WATER



GRASS



AGRICULTURAL LAND

URBAN/BUILDINGS



FOREST ROAD, TRACK



QUARRY



BARE

OTHER VEGETATION



GORSE



ORCHARDS AND SPECIES SUCH AS GORSE (SEE ABOVE) ARE NOT REGARDED AS WOODLAND AND THEREFORE WILL BE EXCLUDED FROM THE WOODLAND MAP IFT's.

Example of Orchards



APPENDIX 7 - Example of England and Wales QA sheet

Table A 8.1 Quality Assurance			
England and Wales		% Area QA'd	
Total no. land squares =	0	10%	Type in the % land area or % of features you have QA'd into the yellow boxes if different from those shown. NB: the majority of time NIWT = 10% and if in doubt please see Esther
Acceptable mean score for 1km square =	10		
Acceptable score for LAND area =	0		
SCORER -		TILE:	
		CONTRACTOR:	
			COMMENTS ON EVALUATION PROCESS THAT WILL BE USED
EXTERNAL WOODLAND BOUNDARY			
Area missing IFT's / LTF's (ha)	0	0	Score 1 for each 1 ha missing
Number of missing IFT	0	0	Score 1 for each part of IFT / LTF added
Area of non wood incorrectly captured as IFT, therefore deleted	0	0	Score 1 for each additional 1 ha deleted
Number of deleted IFT	0	0	Score 1 for each part IFT / LTF deleted
INTERNAL BOUNDARIES			
% Matches (Having to reshape IFT / IOA to imagery)	0	0	100% =0; 99% =1 and so on.
% matches (Having to reshape IFT / IOA to Mastermap)	0	0	100% =0; 99% =1 and so on.
Number of topological errors	0	0	Score 1 for each error in entire tile (100%)
ATTRIBUTES			
% age complete (based on adding attributes)	0	0	100% =0; 99% =1 and so on.
% age correctly attributed (based on agreeing with attribute)	0	0	100% =0; 99% =1 and so on.
IMPORT FORMAT			
NB: this is done once for entire tile			
Suitable (Insert a 0 if suitable)	0	0	Yes =0 No=1000 (If No, then reject)
SAMPLED SCORE FOR TILE (10%):	0	0	RATED SCORE FOR TILE (100%)
Do NOT change scores within GREY area			

EXAMPLE OF WOODLAND BY INTERPRETED FOREST TYPE

