Native woodland survey of Scotland

The methodology used when determining reasons for changes to the area of ancient woodland
The Scottish Ancient Woodland Inventory (SAWI) (Scottish Natural Heritage, 1997*) identified and quantified the area of relevant woodland using a range of information sources available at the time, including the historical "Roy maps" and the 1st edition Ordnance Survey maps. The areas of ancient woodlands given in the Native Woodland Survey of Scotland (NWSS) local authority summary reports are consistently lower than the areas given in SAWI. Within any one local authority area the total real change is likely to be made up of hundreds of small blocks, from slivers up to whole woodlands. The reasons for the changes will also vary between different local authority areas and/or regionally. A ‘probability proportional to size’ sampling based review was carried out to determine and assign the reasons for this change in the SAWI woodland areas. The sampling scheme for a total of N polygons (or 100% census if fewer than 30 polygons in total) in any local authority/regional area is:
- if N is less than 400, sample 30 polygons (or 100% census if fewer than 30 polygons in total);
- if N is more than 400 polygons, sample 1.5 x the square root of N.

The sample interval is calculated as the total area divided by the count, with a starting point chosen as half way between 0 and the sample interval.

If in any area being sampled there were very large polygons which would be sampled more than once, a modified, complex, sampling scheme was applied. In this, the larger polygons below the interval size are all picked and only those above it are sampled, after recalculating a new sample interval.

The differences between the two inventories were categorised as change from ancient woodland into the current uses of:

- **Agricultural use** (fields)
- **Development** (eg. roads, houses, farm buildings, quarries)
- **Estate gardens and sports fields/golf courses**
- **Open Habitat** (often on heath/moorland, with either scattered trees or no trees identifiable at all).

Additionally, the extent of map error was recorded, either as error in the original SAWI map or in the new digital woodland map**.

"Open Habitat" was defined as:

‘Where land previously categorised as woodland no longer has a tree canopy density of at least 20% and where the land is not contained within a clearly recognisable agricultural enclosure and has not been converted to a clear agricultural use (grazing, cropping etc)’.

By overlaying SAWI and NWSS data layers on aerial photography it was possible to quantify and categorise the types of change between the two datasets. Examples of these changes are illustrated below.

The vast majority (by area) of change to open habitats fell into the categories: 1 (No trees) and 2 (Scattered trees).

On occasion it was difficult to distinguish change to open habitat from change to agriculture, such as in upland areas when seeking to compare land that is perhaps used for hill grazing from open moorland. Change to clearly identifiable agricultural land with boundaries was relatively straightforward to identify.

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* Scottish Natural Heritage (1997). The inventory of ancient and long-established woodland sites and the inventory of semi-natural woodlands (provisional). Information and Advisory Note 95.

** See also ‘Ancient woodland area change estimates: local authority and regional report areas’ which can also be found on the NWSS webpages.
Examples of change

Example of change:
**to agricultural use**

No identifiable trees in the area and there were clear field boundaries

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.

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Example of change:
**to development**

No identifiable trees in the area (or insufficient to create a woodland canopy of at least 20%) and clear boundaries at the edge of the development

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.

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Example of change:
**to estate gardens and sports fields/golf courses**

Where any trees remained, there were insufficient to create a woodland canopy of at least 20%  

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.

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Examples of change

Example of change: to Estate gardens and sports fields/golf courses

Where any trees remained, there were insufficient to create a woodland canopy of at least 20%.

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.

Example of change: to open habitat

1. No trees – There were no identifiable trees in the area.

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.

Example of change: to open habitat

2. Scattered trees – Scattered trees often around areas of core woodland.

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.
Examples of change

Example of change:
to open habitat

3. No trees, loss of gorge woodland - no or only scattered trees remaining

- Woodlands on SAWI, not found during NWSS survey.
- Woodlands recorded by NWSS surveyor.

Map error

These categories of ‘change’ identified areas that could be regarded as woodland loss but in fact were errors in the mapping process. Map errors were very significant in the analysis and, generally, the more recent NWSS/NFI datasets have been digitised more accurately than the SAWI maps were.

There are two identifiable sub-categories of map error:

a) Digitising error
b) Polygon offset

1. Digitising error

The digitising of the SAWI polygon was not accurate as it does not cover the woodland in some areas whilst covering too much in others.

- Woodland on SAWI not found during NWSS survey
- SAWI woodland
2. Polygon offset

The polygon digitised from SAWI is clearly offset to the south west.