

Indicator name			Version
NB10a Extent of key semi-natural habitats: terrestrial			29/03/16
Indicator type:	Risk/opportunity	Impact	Action
	X		
SCCAP Theme	SCCAP Objective	CCRA risk/opportunity	
Natural Environment	N2: Support a healthy and diverse natural environment with capacity to adapt	Cross-cutting	

At a glance
<ul style="list-style-type: none"> • Scotland has a rich and diverse range of habitats including some of international conservation importance • Semi-natural habitats are valued for the ecosystem services they provide, which support biodiversity and the economy and contribute to our quality of life • Many semi-natural habitats are under pressure from a number of stressors including climate change • Small, fragmented areas of habitat are less resilient to pressures and can limit the ability of species to track climate space • The available trends show a diverse situation for different types of habitat; with some increasing due to the success of policy interventions and others declining

Latest Figure		Trend
Native woodland	311 kha (2011) ¹ (estimated 319 kha as at 31 March 2013)	No trend possible
Ancient woodland	120 kha (2011) ¹	No trend possible
Acid Grassland	983 kha (2007) ²	Increasing (since 1998)
Broadleaved, Mixed and Yew Woodland	251 kha (2007) ²	Increasing (since 1998)
Bog	2044 kha (2007)	No significant trend
Fen, Marsh, Swamp	239 kha (2007) ²	Decreasing (since 1998)
Neutral Grassland	461 kha (2007) ²	No significant trend
Dwarf Shrub Heath	894 kha (2007) ²	No significant trend
Snow patches	<i>not yet available</i>	No trend possible

Sources: ¹ NWSS (Forestry Commission, 2014); ² Countryside Survey (Norton et al, 2009)

Why is this indicator important?

Scotland contains a rich and diverse range of habitats, some of which are of global conservation importance (H.R. Wallingford, 2012). These support unique species communities, such as Atlantic and montane floras (Aspinall et al, 2011). Important habitats include a significant forest resource; Scotland's native and ancient woodlands are particularly valued for their biodiversity and cultural significance. Forests also provide ecosystem services such as nutrient and water cycling, and the detoxification and purification of soil, water and air.

Habitats in Scotland face many pressures, such as demands on land use for production of food and timber, and from invasive species. The UK National Ecosystem Assessment (Aspinall et al, 2011) reported that habitats have declined both in area and condition over the last 70 years as a consequence of increased exploitation of ecosystem outputs for provisioning services (ecosystem provisioning services include food, water, raw materials and medicinal resources), especially from agriculture. The extent and condition of habitats will affect their ability to cope with pressures, including climate change. It is likely that larger areas of habitat in better condition will be more resilient and therefore more able to sustain or increase the benefits, or 'ecosystem services', they provide to biodiversity and to people.

This indicator records the extent of semi-natural habitats in Scotland. Trend information is included where historic information is available for comparison.

Habitats included are:

- **Native Woodland; Ancient Woodland** (data source Native Woodland Survey of Scotland (NWSS)).
- **Broad Habitats: Acid Grassland; Broadleaved, Mixed and Yew Woodland; Bog; Fen, Marsh and Swamp; Neutral Grassland; Dwarf Shrub Heath** (data source Countryside Survey).

Snow Patches: data not yet available

Related indicators:

NB10b Extent of key semi-natural habitats: coastal habitats

NB11 Extent of key habitats: deep peat

What is happening now?

Table 1 Area of native and ancient woodland (NWSS, 2011)

Habitat type	Area in hectares, 2011	% area of Scotland
Native woodland	311	4%
Ancient woodland	120	1.5%

Source: Forestry Commission Scotland, 2014

Native woodland:

The NWSS (Forestry Commission Scotland, 2014) recorded 311,153 ha of native woodland, accounting for 22.5% of the total woodland area (as at March 2011), or 4.0% of the land area of Scotland. A further 13,383 ha of 'nearly-native' woodland (defined as woodland with between 40% and 50% of native species in the canopy) was recorded. Since survey fieldwork was completed, almost 7,900 ha of additional native woodlands are estimated to have been established up to 31st March 2013. The

high level of deer browsing and grazing is a major factor inhibiting woodland recovery through regeneration. Locally, invasive shrubs, field layer species and non-native tree species are also important threats, while the impacts of climate change and pests and diseases present additional challenges (ibid).

Ancient woodland:

The NWSS found 120,305 ha of woodland to be present on ancient woodland sites, of which 65% was primarily native woodland. Another 2% was nearly-native in composition (40-50% native species in canopy). Woodlands that are on ancient woodland sites and are both native and highly semi-natural in composition are considered to be probably the most important category for nature conservation (ibid). These woods totalled 64,130 ha, making up 20.6% of native woods and just 4.6% of all woodlands in Scotland.

Broad Habitat Change:

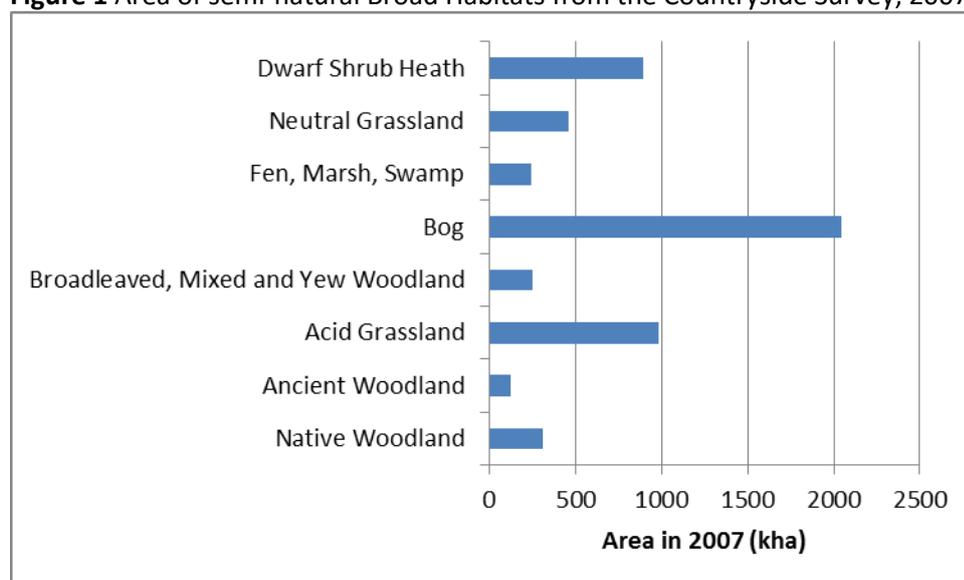
Between the Countryside Surveys carried out in 1998 and 2007 the area of Broadleaved, Mixed and Yew Woodland increased by 9.5% and the area of Acid Grassland increased by 7.9%. There were no significant changes in areas of the other semi-natural Broad Habitats.

Table 2 Area of Broad Habitats (Countryside Survey, 2007)

Habitat type	Area in kha, 2007	% area of Scotland	% Change 1998-2007	Statistically significant change 1998-2007
Acid Grassland	983	12.3	7.9	Yes
Broadleaved, Mixed and Yew Woodland	251 ¹	3.1	9.5	Yes
Bog	2044	25.6	0.2	No
Fen, Marsh, Swamp	239	3.0	-8.6	No
Neutral Grassland	461	5.8	7.2	No
Dwarf Shrub Heath	894	11.1	-2.0	No

Source: Norton et al (2009) ¹The most recent estimate of area of broadleaved woodland is 326 kha, from the National Forest Inventory (Forestry Commission, 2013).

Figure 1 Area of semi-natural Broad Habitats from the Countryside Survey, 2007



Source: Norton et al (2009)

What has happened in the past?

Native woodland

Although native woodlands covered most of Scotland in the post-glacial period, they have suffered centuries of exploitation and decline, and were rarely recognised or managed as important habitats outside nature reserves and designated sites. In 1900 woodland covered less than 4% of Scotland's land area and was fragmented into many small and isolated blocks. Since the 1980s there has been an increasing awareness of the importance of native woodland. Government policies and the work and funding of many public and private bodies have supported the restoration and expansion of native woods (Forestry Commission Scotland, 2014). However, it has not been possible to identify a trend in the extent of native woodland due to lack of consistent data in the past.

Ancient woodland

Many ancient semi-natural woods were converted to plantations through felling and replanting, mainly between the 1950s and early 1980s. Analysis of differences in areas of ancient woodland between that recorded in the NWSS and the earlier Scottish Ancient Woodland Inventory (SAWI) suggests that the total ancient woodland area is now lower than was estimated in SAWI in the 1980s. It is not known how much of this difference represents a real loss of wooded area as inaccuracies and mapping errors within the SAWI estimates may account for some of the difference (ibid).

Broad Habitat Change

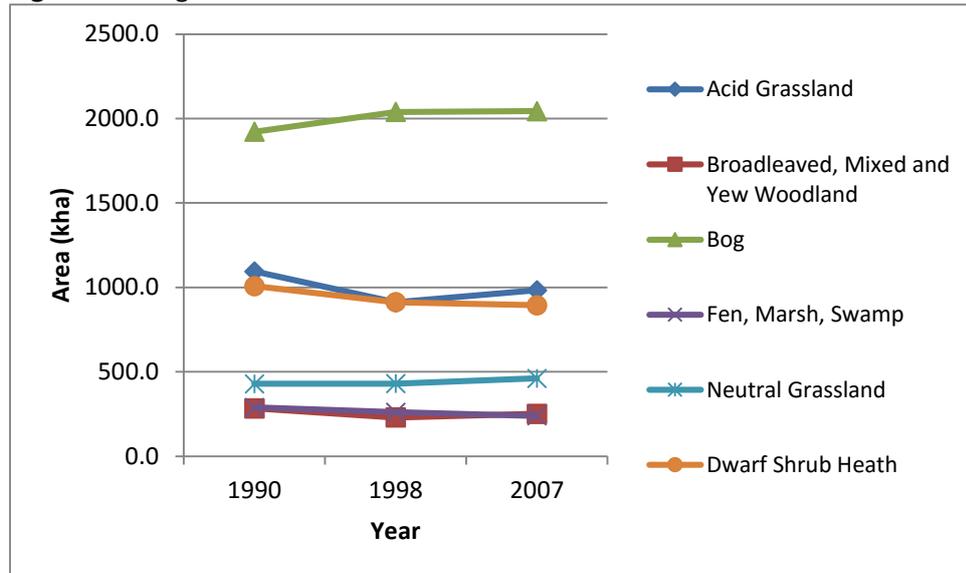
Between the 1990 and 1998 Countryside Surveys there were declines in the area of Acid Grassland; Broadleaved, Mixed and Yew Woodland; Fen, Marsh and Swamp; and Dwarf Shrub Heath. For Acid Grassland and Broadleaved, Mixed and Yew Woodland, these trends were reversed with an increase from 1998 to 2007, however these broad habitats still saw a decrease overall from 1990 to 2007.

Table 2 Broad Habitat change 1990 – 2007 (Countryside Survey, 2007)

Habitat type	Area (kha)			% Change 1990-1998	% Change 1990-2007
	1990	1998	2007		
Acid Grassland	1095.0	910.8	982.7	-16.8	-10.3
Broadleaved, Mixed and Yew Woodland	283.8	229.2	250.9	-19.3	-11.6
Bog	1921.7	2039.0	2043.8	6.1	6.4
Fen, Marsh and Swamp	289.2	260.9	238.5	-9.8	-17.5
Neutral Grassland	428.8	430.0	461.1	0.3	7.5
Dwarf Shrub Heath	1007.4	912.1	894.3	-9.5	-11.2

Source: Norton et al (2009)

Figure 2 Change in area of selected semi-natural Broad Habitats 1990-2007



Source: Norton et al (2009)

What is projected to happen in the future?

Native woodland

The Scottish Government is aiming to expand the amount of woodland in Scotland and set a target (within the Scottish Forestry Strategy) in 2012 of planting 100 kha of new woodland by 2022, requiring the creation of 10 kha of new woodland per year (SNH, 2015). It was intended that at least 4.5 kha of native woodland will be created, or restored from woodland planted with non-native species, per year. This would increase the existing 311 kha of native woodland by 45kha, or nearly 15%, by 2022. However, concerns have been raised that the annual targets are not being met (The Scottish Parliament, 2015).

Ancient woodland

Remnants of the original native woodland cover often remain and can be restored. Such restoration work is now underway on many sites. However, these ancient remnants are still highly vulnerable and fragmented. Smaller, fragmented areas of ancient woodland are likely to be less resilient to climate change (Forestry Commission Scotland, 2014).

Broad habitats

Land use and land management are heavily influenced by policy and legislation, such as the UK Biodiversity Action Plan and the EC Birds and Habitats Directives, and especially by the EU Common Agricultural Policy (CAP). The Scotland Rural Development Programme is designed to encourage a sustainable approach to land management, encompassing agriculture and forestry. The 'preservation and enhancement of our natural ecosystems' and climate change mitigation and adaptation are key aims of the 2014-2020 Scottish Rural Development Programme which will utilise an Agri Environment and Climate Scheme providing direct funding to farmers and land managers for suitable projects (The Scottish Government, 2015).

Patterns of change

Ancient Woodland

Significant fragmentation and loss of woodland cover may have occurred over a 40 year period in ancient woods in unenclosed upland areas. The impact of large numbers of herbivores, especially deer, is likely the main cause of losses. Much smaller apparent losses of ancient woodland to areas under development, estate gardens, golf courses and sports fields and to enclosed agricultural use were recorded (Forestry Commission Scotland, 2014).

Broad Habitats

Vegetation across Scotland has changed, with a decrease in plant species richness but an increase in competitive species, those that do well in wet conditions and those that either provide or prefer shade. Species that are tolerant of stress have decreased. This pattern, observed between 1998 and 2007, is indicative of reduced management across several Broad Habitats, including a reduction in grazing and less intensive management of woodland (Norton et al, 2009).

Interpretation of indicator trends

Native woodland; Ancient woodland

Direct comparison of the findings of the NWSS with earlier data is not possible due to flaws in earlier surveys; therefore no trend information is available. However the NWSS provides a comprehensive baseline for monitoring future trends (Forestry Commission Scotland, 2014)

Broadleaved, Mixed and Yew Woodland

The increase in the area of Broadleaved, Mixed and Yew Woodland between 1998 and 2007 reflects an increasing willingness to plant such woodland on farmland, in ex-industrial areas and to replace conifers with broadleaves. Current and previous strategies, such as the Scottish Forestry Strategy (Forestry Commission Scotland, 2006) and Scottish Biodiversity Action Plan have placed an emphasis on restoring and increasing the area of broadleaved woodland. The increased area would be anticipated to help Broadleaved, Mixed and Yew Woodland better cope with pressures such as climate change (Norton et al, 2009).

Limitations

Ancient woodland

Mapping errors due to boundary changes between the SAWI and the NWSS may have led to some ancient woodland areas being missed in the NWSS and hence an underestimate of the total area of ancient woodland (Forestry Commission Scotland, 2014)

Snow patch data is not yet available.

References

Aspinall, R., Green, D., Spray, C., Shimmield, T. & Wilson, J. (2011). *Status and Changes in the UK Ecosystems and their Services to Society: Scotland*. In: The UK National Ecosystem Assessment Technical Report. UK National Ecosystem Assessment, UNEP-WCMC, Cambridge

Countryside Survey (2007) Chapter 6: Woodlands: Broadleaved, Mixed and Yew Woodlands; and Coniferous Woodland. www.countrysidesurvey.org.uk/outputs/uk-results-2007

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Brown, I, Poggio, L, Gimona, A, Castellazzi, M (2011) Climate change, drought risk and land capability for agriculture: implications for land use in Scotland. *Regional Environmental Change*, 11, 503-518

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Forestry Commission Scotland (2006) Scottish Forestry Strategy. <http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/forestry-strategy>

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The Scottish Government (2015) *Scottish Rural Development Programme 2014-2020 Final Programme* (version 1.3) [online] The Scottish Government. Available from: <http://www.gov.scot/Topics/farmingrural/SRDP/DevelopmentofSRDP20142020/20142020submittedprogramme?refresh=0.054032909676937246> (Accessed August 2015)

The Scottish Parliament (2015) *Committee cites 'tensions' between forestry and farming as factor in decline of Scotland's trees* [online] The Scottish Parliament. Available from: <http://www.scottish.parliament.uk/newsandmediacentre/85484.aspx> (Accessed July 2015)

Further information

Native Woodland Survey Scotland: <http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/native-woodland-survey-of-scotland-nwss>

Scottish Ancient Woodland Inventory: www.snh.gov.uk/docs/C283974.pdf

Acknowledgements

Suzanne Martin (Forest Research/CXC) contributed to this indicator as a lead author.

Appendix One: Indicator metadata and methodology

Table 1: Indicator metadata

	Metadata
Title of the indicator	Extent of key semi-natural habitats: terrestrial
Indicator contact: Organisation or individual/s responsible for the indicator	Ruth Monfries, Royal Botanic Garden Edinburgh/CXC
Indicator data source	Countryside Survey Scotland (CSS) Native Woodland Survey Scotland (NWSS)
Data link: URL for retrieving the indicator primary indicator data.	CSS: www.countryside.gov.uk/outputs/scotland-results-2007 NWSS: http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/native-woodland-survey-of-scotland-nwss/national-nwss-report

Table 2: Indicator data

	Indicator data
Temporal coverage: Start and end dates, identifying any significant data gaps.	CSS: 2007 (1990, 1998, 2007) NWSS: 2014
Frequency of updates: Planned or potential updates	CSS: Not known. NWSS: Native woodlands do not usually change rapidly and an interval of 10 -15 years may be suitable before a repeat survey.
Spatial coverage: Maximum area for which data is available	Scotland
Uncertainties: Uncertainty issues arising from e.g. data collection, aggregation of data, data gaps	
Spatial resolution: Scale/unit for which data is collected	CSS: 1km squares throughout Scotland. NWSS: Polygons of at least 0.5 ha in size.

Categorical resolution: Potential for disaggregation of data into categories	
Data accessibility: Restrictions on usage, relevant terms & conditions	Publically accessible and free of charge

Table 3 Contributing data sources

<p>Contributing data sources</p> <p>Data sets used to create the indicator data, the organisation responsible for them and any URLs which provide access to the data.</p>
<p>CSS: www.countrysidesurvey.org.uk/outputs/scotland-results-2007</p> <p>NWSS: http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/native-woodland-survey-of-scotland-nwss/national-nwss-report</p>

Table 4 Indicator methodology

<p>Indicator methodology</p> <p>The methodology used to create the indicator data</p>
<p>CSS: The Countryside Survey 2007 reported changes between surveys in 1998 and 2007 of 195 1km sample squares in Scotland. The area of each Broad Habitat was mapped within each square during the field study which enables the extent of Broad Habitats to be recorded. The Broad Habitats classification was a framework developed as part of UK Biodiversity Action Plan and allows monitoring of all habitats located within the countryside.</p> <p>NWSS: Field survey of all native woodlands.</p>