NatureScot Research Report 1303 - Ardvar Woodlands SSSI Site Condition Monitoring 2021

Year of publication: 2022

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Cite as: Heaton, S.A. 2022. Ardvar Woodlands SSSI Site Condition Monitoring 2021. NatureScot Research Report 1303.

Contents

Keywords

Ardvar; woodland; regeneration; plots; survey; assessment; Site Condition Monitoring; impacts.

Background

Haycock and Jay Associates Ltd was commissioned by NatureScot to undertake Site Condition Monitoring at Ardvar Woodlands SSSI/SAC in May 2021.

Main findings

- Overall, the whole of Ardvar woodlands the woodland feature is in unfavourable condition.
- Whether the woodland condition has improved or got worse since the previous SCM assessment in 2004 is unclear. This is because the points surveyed in this survey are different to the points surveyed for the 2004 SCM so it is not possible to give a direct comparison. Repeat SCM assessment every six years should help identify any changes in the overall woodland condition.
- The SCM condition of woodland features within enclosures is assessed as Unfavourable recovering.
- The woodland SCM within each estate was assessed as Unfavourable no change except for the North Assynt Estate which is assessed as Unfavourable recovering. This is because most of the assessed woodland within the North Assynt Estate is within enclosures.

Acknowledgements

I would like to thank the landowners and estate managers for access permission and their help and enthusiasm during the survey, particularly Michael Ross, Don O'Driscoll, and Romany Garnett. I would also like to thank Valerie Wilson, Jeanette Hall and Holly Deary of NatureScot for their support and valuable advice on this project.

Abbreviations

Special Area of Conservation (SAC)
Site Condition Monitoring (SCM)
Site of Special Scientific Interest (SSSI)

Introduction

Haycock and Jay Associates Ltd was commissioned by NatureScot to undertake Site Condition Monitoring of Ardvar Woodlands Site of Special Scientific Interest (SSSI)/ Special Area of Conservation (SAC) in May 2021.

The woodland Site Condition Monitoring (SCM) is required to provide an assessment of the current condition of features within Ardvar woodlands. This will allow NatureScot and land managers to direct management and monitor progress towards achieving favourable condition.

Ardvar woodlands are located on the northwest coast of Scotland between Drumbeg and Unapool in Sutherland. The woodland mainly falls within the Ardvar Woodlands SSSI, part of Ardvar and Loch a' Mhuilinn Woodlands SAC, and there are also smaller areas of woodland contiguous with the SSSI to the south and west of Loch Ardbhair.

Ardvar woodlands are birch dominated and split into three main areas: 1. Nedd/Gleann Learaig; 2. Loch Ardbhair, Gleann Ardbhair and Clais Ardbhair; and 3. Kerrachar to Unapool. There is also a small area of woodland on a steep gorge at Creag an Spardain. These woodlands are a relic of what would have once been more extensive forests of northwest Scotland and are of high conservation value. The woodland falls within four different management units; the North Assynt Estate, the Ardvar Estate, the Reintraid Estate and the Quinag Estate (JMT). Currently the deer management on Rientraid is the responsibility of Ardvar Estate while the small area of Kylesku Estate that sits within the site is

managed by the JMT along with the rest of Quinag Estate. On North Assynt Estate the woodland area is tenanted by Nedd Common Grazings while on Quinag and Kylesku Estates the crofting tenants are Unapool Common Grazings.

Despite its high conservation value and relatively unique nature and species richness, the woodland was recorded as being in 'Unfavourable Declining' condition during the last condition assessment in 2004 as part of SNH's monitoring of SSSIs (Scottish Natural Heritage 2004). This was due to the canopy of mature woodland being fragmented in many areas and being below 50% cover; the low numbers of saplings of all species throughout the woodland; and the suppression of woodland understorey and field layer, due to the impacts of browsing and grazing.

There has been a long history of farm animals grazing within the woodlands, however, sheep were removed from the Ardvar Estate in the 1970s and the main herbivore of the woodlands is now red deer. Sheep are also currently present on croft land within the Quinag and Kylesku Estates.

The objective of the survey was to carry out site condition monitoring of the birch woodlands at Ardvar woodlands SSSI. It will provide an assessment of the condition, for each of the woodland features, woodland as a whole, for each estate, inside and outside of exclosures.

Methodology

Survey area

The total survey area consists of all the woodland within the SSSI boundary.

Timing of survey

The survey was carried out in the May 2021 allowing the survey to take place at the optimal time of year for woodland assessment.

The field survey took place over 20 days between the 2nd and 24th of May 2021. To ensure consistency of the collection of data across the survey, all plots were visited by the same surveyor, Steven Heaton MCIEEM.

Number of plots, distribution and plot size

The number of plots surveyed was 30. Ten plots are generally required for SCM but, because of the complexity of the site, and the need to ensure both enclosed and unenclosed land was adequately sampled 30 plots were surveyed. At each of the plots the survey area was 50m in radius from the central point.

Site condition monitoring attributes and targets

Across the woodland and at each of the plots the following attributes in Table 1 were assessed. With the exception of 1.1.2.f. the attributes are the same as those used for the 2004 SCM. The herbivore impact attribute (1.1.2.f.) was added to reflect the now standard use of woodland herbivore impact assessment.

Table 1. SCM attributes

Attribute	Target	Prescription

Attribute	Target	Prescription
1.1.1 Area	1.1.1a No overall reduction	Monitor by field survey every 6 years. Compare new aerial photographs (if available) with old aerial photographs 1976
1.1.2 Natural processes & structural development	1.1.2a Open areas within the woods > height of one tree, present in 10% of stops	Record presence of open areas > one tree height at each point.
1.1.2 Natural processes & structural development	1.1.2b Canopy cover should be > 50% where there are trees	Record average canopy cover at each point
1.1.2 Natural processes & structural development	1.1.2c Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop	Record presence of each of these species, and the extent to which their growth is restricted by browsing
1.1.2 Natural processes & structural development	1.1.2d Diverse tree age structure throughout the site.	Record presence of seedlings, saplings, pole stage/ thicket, mature and over-mature trees at each point
1.1.2 Natural processes & structural development	1.1.2e All trees allowed to die standing. No removal of timber (except on small scale near dwellings)	Record standing and fallen deadwood, and any signs of removal
1.1.2 Natural processes & structural development	1.1.2.f. herbivore impact should be low or absent within enclosures and no more than medium in unenclosed woodland	Carry out full HIA at each point
1.1.3 Regeneration	1.1.3a Regeneration of birch saplings (>1.5m) in open areas of the woods and out onto surrounding moorland throughout the site.	Record birch regeneration where plots are on the edge of the wood
1.1.3 Regeneration	1.1.3b Saplings of all tree and shrub species present in each of the major properties of SSSI	Record species of all seedlings and saplings present. There should be saplings of all tree and scrub species that are present in each of the major properties. NB some species are very localised and we would not expect them to be regenerating where there are no seed sources.

Attribute	Target	Prescription
1.1.4 Composition	1.1.4a Maintain range of native tree species i.e. birch, oak, some rowan, aspen, hazel, willow, holly & wych elm throughout site. Oak at least at Glen Leiraig	Record native tree and shrub species and presence/ absence of both seedlings and saplings
1.1.5 Quality indicators	1.1.5a Presence of Wilson's Filmy Fern and *Lobarion* lichen flora throughout. Maintain uncoppiced hazels at Glen Spardain.	Record presence of Wilson's filmy fern, and of Lobarion lichens (no species list required) at each point. Record any signs of cutting or coppicing.

Results

Sampling Effort

Within Ardvar woodland SSSI 30 sample plots, as well as the woodland areas as a whole, were assessed for the SCM. Numbers of sample plots, including numbers of plots within each of the different management units, and the number of plots within exclosures, are summarised in Table 2.

Table 2. Number of sample plots

Property	Unenclosed plots	Enclosed plots	Total number of plots
North Assynt Estate	1	2	3
Ardvar Estate	13	9	22
Quinag Estate (JMT)	4	0	4
Reintraid	1	0	1
Total	**19**	**11**	**30**

Woodland features condition assessment

Table 3 below provides the monitoring results and the condition for each feature.

Table 3. SCM survey results

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.1 Area	1.1.1a No overall reduction	Aerial photography of Ardvar woods SSSI/SAC from 1984 was compared with aerial photography from 2016 and 2020 of the same area. The area covered by the woodland appears to have changed very little over this time, if at all. The target is met.	Y
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.2 Natural processes and structural development	1.1.2a Open areas within the woods > height of one tree, present in 10% of stops	Open areas present at over 10% of the stops. **Ardvar Estate** open areas present at 22 of 22 stops **North Assynt Estate** open areas present at 3 out of 3 stops **Quinag Estate** open areas present at 4 out of 4 stops. **Reintraid Estate** open areas present at 1 out of 1 stop	Y

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.2 Natural processes and structural development	1.1.2b Canopy cover should be > 50% where there are trees	Canopy cover was more than 50% in 16 of 30 stops. **Ardvar Estate** more than 50% at 9 out of 22 stops **North Assynt Estate** more than 50% at 2 of 3 stops **Quinag Estate** More than or 50% at all 4 stops **Reintraid Estate** target met at stop	N
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.2 Natural processes and structural development	1.1.2c Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop	This understorey target was not met across the woodlands. It is worth noting that most of the woodlands in Ardvar Woodlands SSSI would be deemed as having suitable soils for these species. This target is not met anywhere within the woodlands except on inaccessible ledges. However, holly seedlings were present in at least 9 and hazel in 5 of the SCM plots,	N

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
						demonstrating that there is potential for understorey to develop if herbivore impacts are reduced. Honeysuckle and bramble are sparsely scattered throughout the woodlands and are often very heavily browsed. **Ardvar Estate** this target was not met at any of the stops however hazels with new shoots were noted around Loch Nedd and some hollies were greater than 1 metre. **North Assynt Estate** target not met at any stops **Quinag Estate** Target not met at any stops except on inaccessible ledges at Creag an Spardain **Reintraid Estate** Target not met at stop	

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.2 Natural processes and structural development	1.1.2d Diverse age structure of birch throughout the site	This target is met. Within wooded areas birch are often mature and over mature there are also pole immature stage trees through the woodland. There are birch seedlings and sapling in suitable open areas. **Ardvar Estate** this target is met at all stops, but some stops had low numbers of sapling stage. **North Assynt Estate** all stops met this target. **Quinag Estate** all stops met this target. **Reintraid Estate** stop met this target	Y

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.2 Natural processes and structural development	1.1.2.e All trees allowed to die standing. No removal of timber (except on small scale near dwellings)	Standing and fallen dead trees present at most stops **Ardvar Estate** this target was met at 21 of 22 stops. **North Assynt Estate** target met at all stops. **Quinag Estate** target met at all stops. **Reintraid Estate** target met at stop.	Y

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.2 Natural processes and structural development	1.1.2.f herbivore impact should be low or absent within enclosures and no more than medium in unenclosed woodland	Within enclosures all plots either have Low or absent impacts. However, the target is not met outside enclosures. **Ardvar Estate** target met at 15 of 22 stops. **North Assynt Estate** the majority of the Estate is enclosed, target met at all stops. **Quinag Estate** the target is met 2 of 4 plots. **Reintraid Estate** the target is not met at the plot.	N

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.3 Regeneration	1.1.3a Regeneration of birch saplings (>1.5m) in open areas of the woods and out onto surrounding moorland throughout the site.	Away from stops birch is regenerating in suitable open areas across the site. This target is met at stops that have open areas within 50 metres. **Ardvar Estate** this target is met at 18 0f 22 stops **North Assynt Estate** target met at all stops **Quinag Estate target** met at all stops **Reintraid Estate target** met at stop.	Y

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.3 Regeneration	1.1.3b Saplings of all species present in each unit of SSSI	This target is not met because apart from birch saplings regenerating in open areas there are very few or no saplings of other species except on inaccessible ledges and cliffs such as at Glen Spardain, **Ardvar Estate** this target is not met but hazel saplings occur in the woodland at Nedd loch, and there are aspen saplings on inaccessible cliff ledges such as in Gleann Ardbhain. **North Assynt Estate** target not met **Quinag Estate** target not met but saplings of species such as aspen and hazel are present on inaccessible ledges. **Reintraid Estate** target not met.	N

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.4 Composition	1.1.4a Maintain range of native tree species i.e. birch, oak, some rowan, aspen, hazel, willow, holly & wych elm throughout site. Oak at least at Glen Leiraig	As with the previous SCM survey this target is met for fact that the range exists but the quantity of many species is very poor. A few oaks were observed at Glen Leiraig and Gleann Ardbhair.	Y
Ardvar Woodlands	1 Broad-leaved, mixed and yew woodland	1.1 Birch woodland	SSSI	1.1.5 Quality indicators	1.1.5a Presence of Wilson's filmy Fern and *Lobarion* lichen flora throughout. 1.1.5b Maintain uncoppiced hazels at Glen Spardain.	Wilson's filmy fern is present throughout the site, often in good quantities in suitable humid locations. At Glen Leiraig it is present where a closed canopy on a north facing slope maintains the humidity. Only a little in Gleann Ardbhair where it was seen 4 times. Present in Glen Spardain. Lobarion lichen community occurs through the woodland however it is often very sparse and maybe declining, however the situation will only become	Y

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
						clear with future repeat SCM survey using the same sample locations. Possible reasons for any decline could be reduced humidity caused by a fragmented canopy, or climate change potentially leading to drier periods of weather. **Ardvar Estate** Wilson's filmy fern and Lobarion were both recorded within 50 metres of 13 stops though their presence is often very sparse. **North Assynt Estate** the presence of Wilson's filmy fern and Lobarion lichens within 50 metres of the stops. **Quinag Estate** Wilson's filmy fern and Lobarion lichens were record within 50 metres at 4 of the stops. **Reintraid Estate** Lobarion lichens recorded	Y

Site	Reporting Category	Interest Feature	Interest level	Attribute	Target	Result of Monitoring	Target met? (Y/N)
						within 50 metres of the plot. No coppiced hazels were observed at Glen Spardain.	

Assessment of Ardvar Woodlands as a whole – Unfavourable no change

The results of the SCM of the woodland features in Ardvar Woodlands SSSI indicate that the condition is Unfavourable – no change.

The woodland attributes that fail to meet the targets for Favourable condition are as follows.

- Canopy cover should be > 50% where there are trees.
- Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop.
- Herbivore impacts should be low or absent within enclosures, and no more than medium in unenclosed woodland.
- Saplings of all species present in each unit of SSSI.

North Assynt Estate – Unfavourable recovering

The results of the SCM of the woodland features for the North Assynt Estate indicate that the condition is Unfavourable – improving

It should be noted that only 3 SCM plots were located on the Estate two of which were located within the enclosure. The woodland attributes within the Estate that fail for favourable condition are as follows.

- Canopy cover should be > 50% where there are trees
- Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop.
- Saplings of all species present in each unit of SSSI.

The condition is assessed as Unfavourable Recovering because the woodland feature met the target 1.1.2f for herbivore impact assessment levels, this is mainly due to the fact that the majority of the woodland within the Estate is enclosed, however if the HIA levels remain low it is likely that the condition of the failing features will improve. The one SCM plot outside of the enclosure had medium herbivore impacts, however this plot is relatively close to the road and the village of Nedd. If all of the failing features fail to meet the targets when the SCM assessment is repeated in the future the condition should be recorded as Unfavourable – no change.

Ardvar Estate – Unfavourable no change

The majority of Ardvar Woodlands SSSI and SAC is within the Ardvar Estate, as such the majority of the SCM plots are also located with the Estate. The results of the SCM woodland features within the Ardvar Estate indicate the condition is Unfavourable - no change, this is because until the SCM survey

is repeated using the same sample plots it is not possible to determine whether the conditions are improving or declining within the woodland.

The woodland attributes within the Estate that fail for favourable condition are as follows.

- Canopy cover should be > 50% where there are trees.
- Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop.
- Herbivore impacts should be low or absent within enclosures, and no more than medium in unenclosed woodland.
- Saplings of all species present in each unit of SSSI.

Quinag Estate – Unfavourable no change

The results of the SCM of the woodland features for the Quinag Estate indicate that the condition is Unfavourable no change.

The woodland attributes within the Estate that fail for favourable condition are as follows.

- Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop.
- Herbivore impacts should be low or absent within enclosures, and no more than medium in unenclosed woodland.
- Saplings of all species present in each unit of SSSI.

Reintraid – Unfavourable no change

Only one SCM plot is located within the Reintraid Estate because of its relatively small size.

The woodland attributes within the Estate that fail for favourable condition are as follows.

- Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop.
- Herbivore impacts should be low or absent within enclosures, and no more than medium in unenclosed woodland.
- Saplings of all species present in each unit of SSSI.

Assessment of enclosed areas – Unfavourable recovering

The results of the SCM of the woodland features for the enclosures indicate that the condition is Unfavourable – recovering.

The woodland attributes within the Estate that fail for favourable condition are as follows.

- Canopy cover should be > 50% where there are trees
- Understorey. Hazel with new shoots, honeysuckle scrambling along ground and growing up trees, holly and bramble on appropriate soils >1m high present in 10% of each 50mx50m stop.
- Saplings of all species present in each unit of SSSI.

The condition is assessed as Unfavourable – Recovering because the woodland feature met the target 1.1.2f for herbivore impact assessment levels, if HIA levels remain low it is likely that the condition of the failing features will improve. If all of the current failing features fail to meet the targets when the SCM assessment is repeated in the future the overall condition should be recorded as Unfavourable – no change.

Conclusion

- Overall, the whole of Ardvar woodlands the woodland feature is in unfavourable condition. Whether the woodland condition has improved or got worse since the previous SCM assessment in 2004 is unclear. This is because the points surveyed in this survey are different to the points surveyed for the 2004 SCM so it is not possible to give a direct comparison. Repeat SCM assessment every six years should help identify any changes in the overall woodland condition.
- The SCM condition of woodland features within enclosures are assessed as Unfavourable improving. This is because as opposed to the woodland as a whole the target for herbivore impacts within the enclosed areas is met, it is hoped that given time this will lead to improvement in the condition of the failing attribute features.
- The woodland SCM within each estate was assessed as Unfavourable no change except for the North Assynt Estate which is assessed as Unfavourable improving. This is because most of the assessed woodland within the North Assynt Estate is within enclosures.
- The 1.1.5 quality indicator, ‘presence of Wilson’s filmy fern and Lobarion lichen flora throughout’ is assessed as in favourable condition. This target was assessed across the site as whole as the two indicators were often present in suitable locations however, their presence was often very sparce and they maybe declining across the woodland. Whether the two indicators were present within 50 metres at SCM survey plot was recorded this can be used to compared against future SCM assessment to determine the future attribute condition of this feature.

References

Scottish Natural Heritage, 2004. *Ardvar Woodlands SSSI - SCM targets*. Unpublished document.