

# **MOUND ALDERWOODS SPECIAL AREA OF CONSERVATION (SAC)**

## **CONSERVATION ADVICE PACKAGE**



Image: ©NatureScot

## Site Details

Site name:	Mound Alderwoods
Map:	<a href="https://sitelink.nature.scot/site/8332">https://sitelink.nature.scot/site/8332</a>
Location:	Highlands and Islands
Site code:	UK0013574
Area (ha):	299.52
Date designated:	17 March 2005

Qualifying feature	Assessed condition on this site	SCM visit date	UK overall Conservation Status
Alder woodland on floodplains* (Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> Alno-Padion Alnion incanae Salicion alvae) [H91E0]	Unfavourable Declining	29 June 2010	Unfavourable - Bad

### Notes:

Assessed Condition refers to the condition of the SAC feature assessed at a site level as part of NatureScot's [Site Condition Monitoring \(SCM\)](#) programme.

Conservation status is the overall condition of the feature throughout its range within the UK as reported to the European Commission under Article 17 of the Habitats Directive in 2019.

\* Habitats Directive priority habitat

### Overlapping Protected Areas:

Mound Alderwoods SAC has the same boundary as

- Mound Alderwoods Site of Special Scientific Interest (SSSI)  
<https://sitelink.nature.scot/site/1202>

and overlaps with

- Dornoch Firth and Loch Fleet Special Protection Area (SPA)  
<https://sitelink.nature.scot/site/8490>
- Dornoch Firth and Loch Fleet Ramsar site <https://sitelink.nature.scot/site/8420>

### Key factors affecting the qualifying feature

#### Alder woodland on floodplains

Alder woodland on floodplains is a priority qualifying habitat.

This area was formerly tidal, part of Loch Fleet estuary, but when the Mound causeway was constructed in 1816, it was largely sealed off from the sea and gradually colonised by alder and willow to form the present mixture of dense wet woodland, open fen and brackish lagoons.

The woodland on this site is dominated by alder *Alnus glutinosa* and willow *Salix* spp. on islands in river channels and low-lying wetlands alongside the channels. The habitat typically occurs on moderately base-rich, eutrophic soils subject to periodic inundation.

As this woodland habitat is dynamic in nature, the structure and function are best maintained within a larger unit that includes open wetland communities and successional stages between wetland and woodland.

Key management issues include hydrology, which involves active management of water levels at the Mound sluice. Research work undertaken in partnership with Forest Research identified that the trees on the site were probably suffering from water logging. This has resulted in die-back of alders and associated tree disease (i.e. *Phytophthora*), which has adversely affected a large proportion of this SAC, resulting the site being in unfavourable condition.

In response to the water logging issue the sluice gates have been automated. This ensures that the gates will close at high tide to prevent inflow of seawater and opened to their full extent at low tide during periods of high water within the site. This allows a greater volume of water to be released, reducing time that the site is flooded. Sea-level rise may also be increasing freshwater retention within this SAC.

High water levels in ditches within and on the edge of the site can also contribute to water logging if not routinely cleaned.

The habitat is also affected by browsing and trampling impacts from herbivores, mainly by deer. Deer control is being carried out by the landowners, and deer jumps installed by Network Rail to prevent young red deer becoming trapped within the SAC.

The site is also currently threatened by encroachment of Himalayan balsam, an invasive non-native plant, which is being controlled upstream by the local community in an effort to prevent it establishing within this SAC. Skunk cabbage (a potentially invasive, non-native plant) has been recorded within the site, but currently it is considered rare.

Further information about Alder woodland on floodplains can be found [here](#).

## Conservation Priorities

This SAC overlaps with the Dornoch Firth and Loch Fleet SPA. Any pro-active management for Mound Alderwoods SAC or assessment of plans or projects subject to a Habitats Regulations Appraisal, will also need to take account of the SPA interests.

## Conservation Objectives for Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0] (Alder woodland on floodplains)

**1. To ensure that the qualifying feature of Mound Alderwoods SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status.**

Favourable Conservation Status (FCS) is considered at a European biogeographic level. When determining whether management measures may be required to ensure that the conservation objectives for this site are achieved, the focus should be on maintaining or improving the contribution that this site makes to FCS.

When carrying out appraisals of plans and projects against these conservation objectives, it is not necessary to understand the status of the feature in other SACs in this biogeographic region. The purpose of the assessment should be to understand whether the integrity of the site (see objective 2) would be maintained. If this is the case then its contribution to FCS across the Atlantic Biogeographic Region will continue to be met. Further details on how these assessments should be carried out in relation to maintaining site integrity is provided by objective 2 (including parts a, b and c). If broader information on the feature is available then it should be used to provide context to the site-based assessment.

Note that “appropriate” within this part of the conservation objectives is included to indicate that the contribution to FCS varies from site to site and feature to feature.

## **2. To ensure that the integrity of Mound Alderwoods SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature.**

The aim at this SAC is to restore the Alder woodland on floodplains to favourable condition as a contribution to its wider conservation status. Therefore any impacts on the objectives shown in 2a, 2b, or 2c below must not persist so that they prevent the achievement of this overall aim. When carrying out appraisals of plans or projects the focus should be on maintaining site integrity, specifically by meeting the objectives outlined in 2a, 2b and 2c. If these are met then site integrity will continue to be maintained. Note that not all of these will be relevant for every activity being considered. Any impacts on the objectives shown in 2a, 2b or 2c below must not persist so that they prevent the maintenance of site integrity. Temporary impacts on these objectives resulting from plans or projects can only be permitted where there is certainty that the features will be able to quickly recover.

This objective recognises that the qualifying habitat is exposed to a wide range of drivers of change. Some of these are natural and are not a direct result of human influences. Such changes in the habitat’s extent, distribution or condition within the site which are brought about by natural processes, directly or indirectly, are normally considered compatible with the site’s conservation objectives. An assessment of whether a change is natural or anthropogenic, or a combination of both, will need to be looked at on a case by case basis.

### **2a. Maintain the extent and distribution of the habitat within the site**

The extent of the alder woodland on floodplains feature, taken from the Standard Data Form, has been estimated at 209.66 ha. This represents the amount of often complex, mosaic of several individual stands of habitat. There should be no measurable net reduction in the extent of the habitat and its distribution throughout the site.

Maintaining extent will include avoiding effects that could lead to a permanent reduction in the extent or distribution of the habitat such as inappropriate water levels, tree disease (e.g. *Phytophthora*), agricultural reclamation, fire and dumping of waste.

This conservation objective is considered to be met if the conditions to ensure the habitat’s long-term existence are in place.

### **2b. Restore the structure, function and supporting processes of the habitat**

This habitat depends on hydrological conditions that lead to a high water table, but do not cause permanent water-logging of the site. These conditions were created at the Mound by the embankment and sluices built in 1816, which were operated manually by a lockkeeper until relatively recently. The alder trees are currently suffering as a result of water levels being too high. The modern, automated control of the sluices should therefore replicate historical water management by releasing water from the site at low tide (especially during periods of flooding) and closing so that only a small amount of salt water enters the site at

high tide.

Water flow within the site should follow natural processes, subject to overall water levels being controlled by the embankment and sluice. There should be sufficient variation in the wet conditions to allow channel dynamics and vegetation succession to occur. This should allow for an abundance of key tree species that have the functional characteristics of alder and willows. These characteristics are

- Can colonise the floodplain substrate (wet, unstable) and thrive (tolerance of high water table) pioneer species recolonising riparian habitats after disturbances.
- Can create important habitat structure for breeding wetland birds.
- Can support a wide variety of terrestrial invertebrates, whilst overhanging the water surface (providing food for fish and other aquatic predators).
- Can provide leaf litter with a rapid decomposition rate.
- Provide moderate shade over the water surface for fish.
- Can capture or fix nitrogen and make it accessible to other parts of the ecosystem.

Other measures that will maintain the structure, function and supporting processes of the habitat are: preventing widespread colonisation by invasive species such as Himalayan balsam and skunk cabbage, and maintaining grazing levels that allow trees, shrubs and ground flora to develop naturally to flower and fruit (which is particularly important on drier margins). In the long term, the site should have a low level of grazing by red and roe deer, which allows trees to regenerate and which helps to prevent too many trees of a single age from dominating the wood in dense stands in future decades.

## **2c. Restore the distribution and viability of typical species of the habitat**

This site provides examples of successional stages from estuarine mud to dense woodland and is representative of the more stable form of this habitat. The alderwoods have both dry and waterlogged areas. At this site, this Annex I habitat falls mainly within the W7 *Alnus glutinosa* – *Fraxinus excelsior* – *Lysimachia nemorum* woodland NVC type.

The key tree species found in this habitat are alder *Alnus glutinosa*, downy birch *Betula pubescens*, ash *Fraxinus excelsior* and willow *Salix* spp. Other tree species include; hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, bird cherry *Prunus padus*, rowan *Sorbus acuparia* and holly *Ilex aquifolium*. Some Scots pine *Pinus sylvestris* and juniper *Juniperus communis* are found on the drier ridges. These transitions from wet to drier woodland and from open to more closed communities provide ecological variation. The ground flora is correspondingly varied in this respect.

The viability of the alder woodland should be restored by controlling the water level on the site so that the water logging which contributed to the death of some areas of alder trees is prevented.

Alder is the main tree species which has been adversely affected by water-logging and associated *Phytophthora* disease. If a suitable water table and water management regime can be put in place to restore the condition of alder, then it is anticipated that other species will also benefit as a result.

It is possible that sea level rise might be contributing to the water logging problem, which, if it is, will result in the sluice gates being closed for a longer period. A Management Plan is in place for the operation of the new automated sluice gates (governed by SEPA) which involves monitoring tree condition and relating this to water levels and sluice gate operation.

Regeneration of young trees of all the species mentioned above should be encouraged where ground conditions permit across the site. The site should contain seedlings, saplings,

mature trees and standing deadwood, rather than being dominated by the mature trees as it is at present. In the long term, the habitat will benefit from grazing and browsing by red and roe deer, but deer numbers need to be low enough to allow sustainable tree regeneration.

Characteristic plants that should continue to be widespread on the site include meadowsweet *Filipendula ulmaria*, remote sedge *Carex remota*, valerian *Valeriana officinalis*, marsh thistle *Cirsium palustre*, sneezewort *Achillea ptarmica* and tufted hair-grass *Deschampsia cespitosa*. The adjacent swamp and fen areas include species such as fen ragwort *Senecio paludosus*, marsh pennywort *Hydrocotyle vulgaris*, marsh bedstraw *Galium palustre* and water mint *Mentha aquatica*.

The alderwood habitat is also home to notable species including pintail *Anus acuta*, wood sandpiper *Tringa glareola*, osprey *Pandion haliaetus*, kingfisher *Alcedo atthis*, and grasshopper warbler *Locustella naevia*.

### Conservation Measures

Mound Alderwoods is notified as a Site of Special Scientific Interest and management changes described on the list of Operations Requiring Consent must have prior consent from SNH (NatureScot).

### Current and recommended management for Alder woodland on floodplains

Issue	Measure	Responsible party
Hydrology – Restoration and maintenance	<p>It is important to restore and maintain an appropriate hydrological regime on the site by a combination of sluice control and ditch maintenance.</p> <p>The automation of the sluice gates, ensuring they are opened to their full extent during flood conditions, is the most that can be done at this time to benefit the wet woodland habitat.</p> <p>The depth of the freshwater trigger level could potentially be lowered, which would mean the sluice gates would be opened more often. This action should be informed by either water or tree monitoring results, or both.</p> <p>Maintaining ditches in good functioning condition, free from fallen tree debris and silt build-up will help ensure water flows freely through the site, reducing water logging conditions. Some ditches may still require to be cleared after years of non-active ditch management. This can be discussed on a case by case basis.</p>	Land manager, SEPA, BEAR Scotland (control of the sluice at The Mound) & NatureScot.
Tree disease ( <i>Phytophthora</i> )	<p>Positive works carried out to reduce water logging will help to reduce trees becoming affected by <i>Phytophthora</i>.</p> <p>There are no other actions that can be taken</p>	Land manager & NatureScot

	on trees already affected, other than natural recovery aided by site management (see hydrology above).	
Herbivore impacts	Deer control is needed throughout the site to reduce the effects of browsing and trampling to a low level, informed by the Woodland Grazing Toolbox.  Deer jumps are to be established adjacent to the newly erected railway fences, which are preventing young deer from crossing, due to the higher than normal stock fence height.	Land manager, Network Rail & NatureScot
Avoidance of invasive or non-native species	Potentially invasive non-native species should not be introduced to the site (either directly, or by allowing them to establish upstream of the SAC which could allow seeds to be carried onto the site by water). Landowners and local volunteers could work together to help prevent plants such as Himalayan balsam or skunk cabbage establishing within this SAC.	Landowners, volunteers & NatureScot
Future threats	A co-ordinated resilience planning process should be developed to respond to anticipated future threats to the habitat. Management actions arising from the resilience planning process, and site-level plans, should be implemented to anticipate future threats to the habitat on the site. This resilience work may also include further research to understand the vulnerabilities of the habitat.	NatureScot & Land managers
Research and monitoring	To monitor water levels and tree condition to gauge trends and to inform any future actions (e.g. lower the trigger level for sluice gates to be fully opened).	NatureScot & Universities

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