Assessing and addressing the impacts of ash dieback on UK woodlands and species of conservation importance

Case study 1 : Rassal

Case study key facts

Total area of woodland: **85 ha**

Proportion of ash in canopy overall**: 85%**

Woodland structure: **high forest / wood pasture**

NVC: **W9 and W7**

Vulnerable ash-associated species: **125**

Alternative trees and shrubs: **several present but at low abundance, aspen could be introduced**

Management: **use natural regeneration or planting for establishment; prevent browsing damage by herbivores**

Site and Location

Name	Rassal
Country	Scotland
Local Authority	Highland
Landscape context	Woodland located on gentle western facing slope of limestone terraces and a gorge within in a mountainous landscape

Large, old, ash trees in open area with a dense patch of younger trees and understorey in the background (photo SNH)

Site Characteristics

Woodland area
85 ha

Woodland type
Predominantly NVC W9 - Upland Mixed Ash Wood but also some areas of W4, W7, W11 and W17.

Soil type
Predominantly free draining calcareous soils, with small amounts of poorly drained soils in depressions.

Lithology
Cambrian Durness Limestone.

Stand structure
Woodland on the upper slopes is high forest whilst that on the lower retains the appearance of wood pasture. About 85% of the overstorey canopy is ash with mature and veteran trees dominating the lower slopes, and pole stage / immature trees on the upper slopes. The overstorey also includes *c.* 10% cover of hazel with the remaining 5% of the canopy consisting of rowan, downy birch, goat and eared willow, and scattered rare individuals of hawthorn, holly, common alder, wild cherry, wych elm and oak. The understorey cover is about 25% and is almost entirely hazel. Ash saplings and smaller juveniles (< 1.3 m tall) are abundant throughout the wood but in some areas there is significant damage caused by cattle and a group of red deer which have recently broken into the exclosure. The small open glades present are generally dominated by bracken. Bramble is present on site but is well browsed as are the palatable grasses, an abundance of mosses and lichens occur across the site on both on the ground and trees.

Biodiversity interest

Designations
This is the largest ash wood of its kind on limestone in the Highlands and is the main habitat of interest in the Rassal SSSI (*c.* 1000 ha). The site is also part of a SAC which identifies the woodland on the limestone as designated habitat, namely *Tilio – Acerion forests of slopes and ravines* (*i.e.* mixed woodland on base rich soils associated with rocky slopes).

Vulnerable species likely to be affected
A total of 125 species associated with ash were identified more than 100 of which were lichens; the majority of the remainder were bryophytes with a few fungi, invertebrates and birds. However almost all species are only partially associated with ash: there is 1 obligate and 5 highly associated lichens, and 2 highly associated fungi.

Other species of conservation interest
There are a range of interesting species at this site in a variety of taxa including the flowering plant *Epipactis atrorubens* and the saproxylic fly *Xylophagus ater.*

Management

Historical
Traditionally used for stock grazing, but there is some evidence of long abandoned hazel coppice Since designation as an NNR in 1956, activities have concentrated on securing the future of woodland cover by planting trees, and promoting natural regeneration by fencing to exclude deer and livestock.

Current
Controlled grazing using Highland cattle and management of bracken to improve conditions for flowering plants and invertebrates, and also increase species richness. Continued exclusion of deer.

Long-term vision for site
An area of woodland occupying the same area which is managed as wood pasture that has a greater species richness than at present.

Factors limiting delivery of management currently planned
Long-term integrity of the fence to exclude red deer and prevent over grazing. Providing conditions which will allow an increase in species diversity.

Future methods of management

Potential response of ash associated species to ash dieback
The obligate species will be lost, but all of the highly ash associated species have one or more alternative tree or shrub species present on site. With the exception of one lichen all can use hazel which is abundant across the site. Alternative tree species for the lichen *Caloplaca flavorubescens* are oak and wych elm that are rare, consequently it may be more vulnerable than the other 6 species. Introduction of aspen which can act as an alternative for all vulnerable species, and an increase in the amounts of oak, wych elm, birch and rowan is likely to support populations of all vulnerable species. The non-native sycamore can also be used as an alternative by most of the species.

Continuation of existing management with loss of ash occurring
Loss of ash will have a significant effect on the structure of the stand which will have a much reduced overstorey cover with understorey hazel becoming the predominant woody species. Whilst most of the vulnerable ash associated species are likely to survive on the hazel present, an increase in the abundance of the other alternative species is difficult to ensure. Natural regeneration of most species is either absent or very rare. Unless protected, any regenerating seedlings will be susceptible to browsing. The increased openness is likely to create conditions which are favourable for the growth of bracken which is likely to inhibit natural regeneration. Diversification of the range of alternative tree species which can support ash associated species will be difficult and unpredictable.

Management allowing for loss of ash but maximising persistence of ash associated species
As alternative trees are already present on site the vulnerable species are likely to survive in the short term, but their longer term prospects will be improved by an increase in the abundance and diversity of the trees present. Natural regeneration is likely to be unpredictable but could be tried for some species already at the site (*e.g.* birch, rowan and willow). Planting could be used to introduce other species such as aspen and also increase the abundance of all alternative trees already present. However, young plants would require guaranteed protection from deer and cattle until they are beyond browsing height, and treatments to control bracken may also be necessary.

Factors likely to constrain delivery of future management to maximise persistence of ash associated species
Providing conditions which are suitable for the establishment of alternative tree species especially prevention of browsing damage by large herbivores either managed cattle or unmanaged deer.

Potential for use of generic methods to establish alternative species
Any of the options could be used, but those in which natural regeneration is promoted or trees are replanted and sites are subsequently managed (options 4 + 6), are likely to be the most successful for diversifying and increasing the abundance of alternative species.