

RESEARCH UPDATE

Wet woodland

Russell Anderson & Nadia Barsoum

This article describes how wet woodland habitats might be affected by shifts in management practice and/or eco-hydrological conditions. It is based on a literature review in *English Nature Research Report 619*, and will serve to guide the Environment Agency in their review of consents for potentially damaging activities such as those stemming from water abstraction and effluent discharge.

Bog woodlands

Bog woodlands in Scotland primarily comprise nutrient-stressed Scots pine (*Pinus sylvestris*) dominated communities that get their nutrients solely from rainwater (ombrotrophic bogs)

- Tree growth is slow and mortality high, resulting in open woodland sparsely populated by stunted trees.
- The main eco-hydrological threat is from a lowering of the water table. As aerobic conditions develop, mineralisation rates increase allowing for deeper rooting.

Maintaining or repairing the ground-water mound is the key to eco-hydrological protection for this type of bog woodland. Nutrient loading may be a serious threat in a minority of cases.

In England, bog woodlands occur on valley mires dominated by downy birch (*Betula pubescens*)

- Nutrients come either from surface water or upwelling spring water.
- Richer than ombrotrophic bogs, nutrient availability is still the limiting factor, preventing succession to more productive woodland types.
- Woodland on surface-water fed bog can be vulnerable to abstraction and nutrient pollution (eutrophication) within the valley mire's catchment.

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- Those fed by springs may be sensitive to a reduction in aquifer pressure or groundwater enrichment.

Some bog woodland sites are subject to birch spreading onto raised bog. This may be because peripheral cutting or drainage has lowered the ground water mound. This type of woodland is likely to be part of a succession towards a more productive woodland type. Lowering of the water table would speed up the process, resulting in earlier loss of the bog woodland.

Alluvial forests

The residual alluvial forests existing today in Britain can occur in various landscape situations throughout a river valley and are recognised primarily within the W5, W6 and W7 National Vegetation Classification categories.

Alnus glutinosa – *Carex paniculata* (W5) alluvial forest communities

- Typically occur on the edges of standing or very slow-moving freshwater bodies/courses.
- These include lakes and ponds, or damp depressions on the floodplain e.g. in former side-channels and backswamps.
- Water is derived from surface flow and/or groundwater sources (e.g. spring-fed, subsurface percolation of water from a river in flood).
- Limited disturbance from floodwaters leads to accumulation of organic material, resulting in superficial organic deposits over mineral alluvial deposits.
- Grey willow (*Salix cinerea*) and alder (*Alnus glutinosa*) dominate pioneer communities, while alder almost exclusively populates older stands.
- A falling watertable leads to the eutrophication of soils (caused by oxidation and release of nitrogen) eventually resulting in *Alnus-Urtica* woodland communities.
- Rising water levels as a result of peat extraction leads to the development of swamp vegetation.
- Eutrophication of incoming water sources leads towards *Phragmites-Urtica* fen on the water

edge and *Alnus-Urtica* woodland at higher elevations.

Alnus glutinosa-Urtica dioica (W6) alluvial forest communities

- These are distinct from W5 alluvial forests,

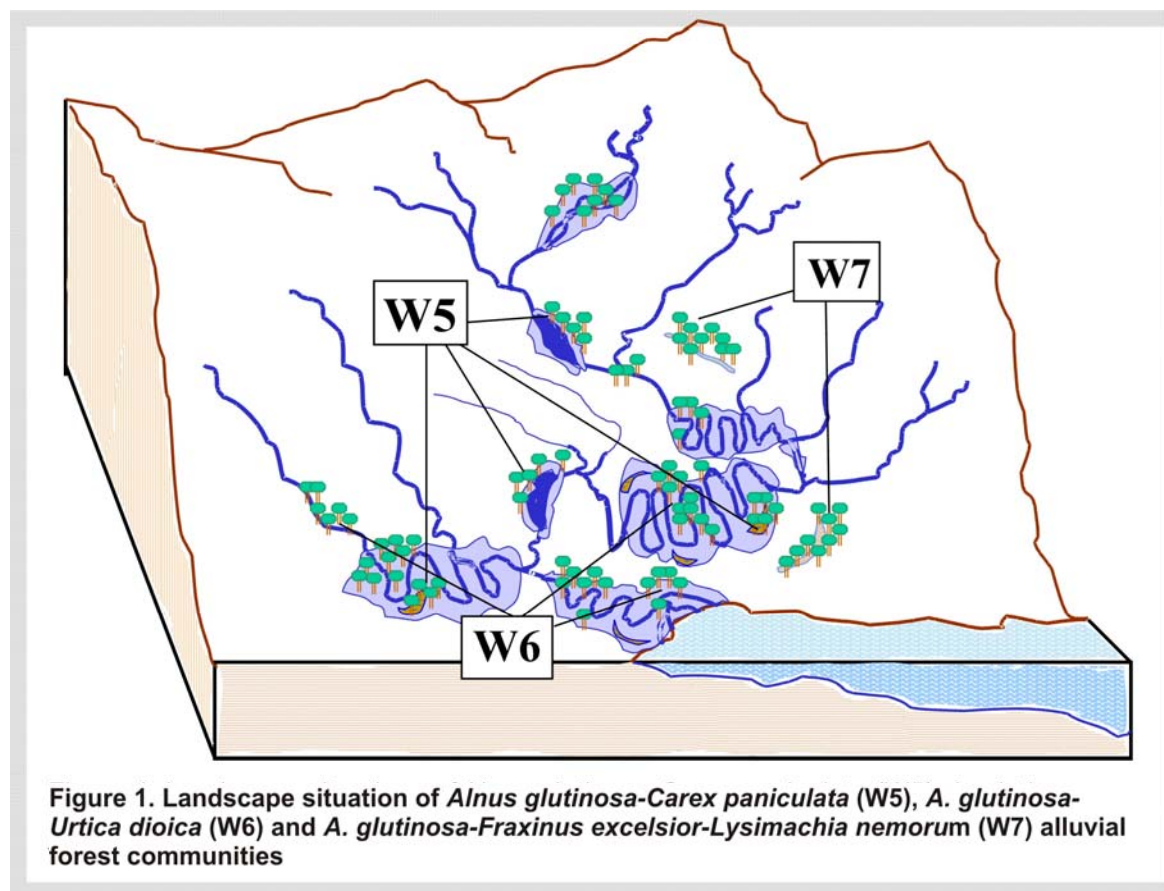


Figure 1. Landscape situation of *Alnus glutinosa-Carex paniculata* (W5), *A. glutinosa-Urtica dioica* (W6) and *A. glutinosa-Fraxinus excelsior-Lysimachia nemorum* (W7) alluvial forest communities

occurring along fast or slow flowing rivers and streams, as strips of vegetation along the stream banks and/or on instream islands.

- The size of the woodland depends on how confined the river valley is, the degree of human occupation of the floodplain and encroachment into riparian zones.
- With the frequent movement of sediments during flooding events, there is a constant threat of riverbank erosion and deposition, not present in the other two alluvial forest types.
- Also unique to this alluvial forest type is clear sub-community zonation. This is determined by depth to the water table and frequency of disturbance at varying elevations within the riparian zone.
- Lowering of water table levels and/or reduced and disrupted seasonality of flooding speeds the evolution towards later successional vegetation communities dominated by hardwood species.

- Eutrophication leads to the rapid spread of invasive species and understorey growth.

Alnus glutinosa – Fraxinus excelsior-Lysimachia nemorum (W7) communities

- Present on higher ground along river valleys, these communities can be found along the edges of the wider wooded valley, well beyond the main river course, and in areas of sharper relief.
- They are common on the fringes of the uplands in the north and west of Britain and areas such as the Weald in south-east England.
- With no reliance on surface water originating from rivers, this alluvial type depends chiefly on

groundwater supplied from:

- subsurface (and surface) flows down valley slopes and/or
- springline flow from rock strata.
- Where water table levels drop a transition to damp oak woodland (W10 or W11) is expected.
- The direction of the vegetation community transition is less clear where eutrophic conditions develop.

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The West Highland Woodland Grazing Project

Lucy Sumsion

Over the last ten years there has been increasing recognition of the important role that grazing livestock can play in encouraging natural regeneration and enhancing the biodiversity value of woodlands. During 2005, the Argyll Farming and Wildlife Advisory Group (FWAG) has worked in partnership with the following organisations in promoting the conservation and economic value of woodland grazing through the West Highland Woodland Grazing Project (WHWGP):



- Forestry Commission Scotland (FC Scotland)
- Scottish Executive Environment Rural Affairs Department
- Scottish Native Woods
- Scottish Natural Heritage
- West Highland European Leader Kist (Leader+)

The project has been operating under the umbrella of the Argyll & Bute Biodiversity Partnership.

The last year has been an extremely active one for the WHWGP. We have:

- Held two successful workshops and produced proceedings for each
- Undertaken a field-based review of woodland grazing sites in Argyll & Lochaber

- Produced two newsletters with a distribution list of over 500 names.

The WHWGP has been influential in the introduction in November 2004 of a Pilot Stewardship Grant (S9) for Controlled Livestock Grazing in Woodland by FC Scotland. If the Pilot scheme can demonstrate that conservation grazing in woodlands can be successfully incorporated into a mainstream funding mechanism, there could be significant environmental, economic and social gains.

The next year will see the:

- Delivery of a woodland grazing toolkit by the WHWGP
- Setting up of a number of pilot woodland grazing sites by the FC Scotland through the Scottish Forestry Grant Scheme.

The WHWGP Steering Group will take forward lessons learnt from the workshops we have held; paying particular attention to the need for a practitioner

centred approach, and also the requirement to develop a long-term approach to the delivery of public benefits from woodland grazing. We aim to hold a series of practical site-based visits on woodland grazing over the next 12 months.

For more information about the WHWGP, contact:

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CONFERENCES

Botanical Society of Scotland Symposium on Atlantic Oakwoods

This symposium will take place at Corran Halls, Oban, from the 14th –16th September 2005. Ecology Division staff Jonathan Humphrey, Joan Cottrell and Richard Thompson are contributing to the organisation.

For more information visit the conference website at:

www.geos.ed.ac.uk/abs/bss/

Or contact:

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PEOPLE NEWS

Ecology Division welcomes Darren Moseley

I have recently joined Ecology Division (based at Northern Research Station) as an Ecological Project Support Officer. I am working on a number of projects, including Forest Habitat Networks and Habitats and Rare Priority and Protected Species (HaRRPS).

Last year I completed my PhD (funded by the Scottish Forestry Trust), which focused on modelling the incidence and impact of a fungal pathogen of Scots pine trees. This involved the examination of the environmental, edaphic, and biophysical factors influencing the incidence of the disease using a GIS, and modelling using a Bayesian approach.

During the last three years I have also been involved in a European Union funded project concerned with another fungal pathogen: Modelling of *Heterobasidion* Infection in European Forests (MOHIEF). This project gathered existing

knowledge and experience of the ecology of the organism, and ecotypes in which it occurs, to produce a model explaining the initiation, development, and spread of the disease.

Both these projects involved a significant amount of spatial modelling and sensitivity analyses, which I will be able to bring forward into my current work on Forest Habitat Networks.

Outside of work, I enjoy hill-walking, mountain biking, snowboarding & circuit training. My sporting activities recently expanded when I was encouraged (or was it press-ganged?) into playing for the NRS football team.

CONTACT DETAILS

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