River Blackwater (Cork/Waterford) SAC (site code 2170)
Conservation objectives supporting document-
woodland habitats

Version 1

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Introduction

The River Blackwater (Cork/Waterford) system contains a considerable amount of woodland. In most cases the individual woodlands are relatively small but more extensive woodlands occur in some of the incised tributary valleys and in the lower reaches of the River Bride. The acidic rocks of the uplands produce relatively well-drained, poor, acidic soils which favour the development of sessile oak woodlands on the steep valley sides. Locally, colluviation and flushing enriches the soils allowing the development of ash and hazel woodlands, which also occurs on pockets of more fertile soils. The valley floor of the Blackwater itself is relatively broad and the fertile land is under pasture or crops. Most of the woodland is situated on the valley sides, especially on the northern banks of the Blackwater, with only small pockets of alluvial woodland on the valley floors. In the lower reaches subject to tidal influence, however, alluvial woodland is more extensive.

The classification of woodlands, and in particular the affinities between classifications, presents difficulties. In some cases, sites classified as ash woodland (WN2 under the Heritage Council classification system (Fossitt, 2000)) by Perrin *et al.* (2008) conform more closely with the more fertile element of sessile oak (*Quercus petraea*) woodlands (*Rubus fruticosus-Corylus avellana* sub-type), based on their flora and the pH of the soils. In these cases I have classified them as Annex I habitat 91A0. Similarly, some woodlands classified as wet pedunculate oak (*Quercus robur*) woodland (WN4) conform with alluvial woodland and have been classified as 91EO. I have also included some areas of mixed deciduous woodland with beech (*Fagus sylvatica*) and sycamore (*Acer pseudoplatanus*) where the flora is essentially comparable to sessile oak woodland.

The total area of native woodland and mixed deciduous woodland within the SAC is estimated as 1699ha based on mapping from NPWS (2006) and the national survey of native woodlands (Perrin *et al*., 2008). Unsurveyed areas include river islands and woodland bordering the Blackwater and its tributaries, which are almost certainly subject to flooding (91EO), as well as valley sides and woodland scattered through farmland, some of which is possibly 91AO. For the reasons given above a precise breakdown of this area into different woodland types is not possible. Of the 21 sites within the SAC surveyed by Perrin *et al*. (2008), old oak woodland covers c. 263.7ha and alluvial woodland c.19.3ha. In addition there are c. 4ha of mixed woodland in which yew (*Taxus baccata*) is abundant and could potentially become the dominant species. However, the cover of yew is <50% and the general composition and structure of the wood does not currently conform to the definition of yew woodland as used in conservation assessments.

Some of the surveyed woodland sites extend beyond the SAC boundary. The sites identified as containing the Annex I habitats are listed in Appendix 1.

This SAC contains the only recorded site in the country for starved wood-sedge (*Carex depauperata*). This occurs in a small, non-Annex I ash woodland on a limestone outcrop near Ballyhooley, Co. Cork. The most recent survey (2009) found only one specimen. The species is subject to *ex situ* conservation measures.

Woodland types

There are four principal woodland types present within the SAC: alluvial woodland; old oak woodland; mixed deciduous woodland, usually with abundant beech and/or sycamore; conifer plantations. Ash woodland (*Corylo-Fraxinetum*) seems to be rare. One small stand of yew woodland is also present.

This SAC has been selected for three woodland types listed in Annex I of the Habitats Directive:

- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
- 91J0 Yew (*Taxus baccata*) woodlands of the British Isles

<u>91E0 Alluvial woodland</u>

This is a generic term for a number of different woodland types. The principal communities within the SAC are:

- Gallery woodland dominated by tree willows, principally *Salix triandra, S. alba, S. fragilis, S. viminalis* and *S. cinerea*. This community consists of small, narrow stands on the river banks (particularly where restricted by embankments) and islands where the trees are subject to frequent flooding and/or have their roots permanently in water. More extensive, although still patchy, stands occur along the Bride and on the Blackwater downstream of Cappoquin. The vegetation is typically characterised by a tangle of fallen and sprawling trees and shrubs, including guelder rose (*Viburnum opulus*), and a luxuriant tall herb layer, which includes nettle (*Urtica dioica*), canary reed-grass (*Phalaris arundinacea*), bindweed (*Calystegia sepium*), gypsywort (*Lycopus europaeus*), bittersweet (*Solanum dulcamara*), meadowsweet (*Filipendula ulmaria*), pendulous sedge (*Carex pendula*) and various mosses and algae. The introduced species, Himalayan balsam (*Impatiens glandulifera*) is widespread.

- Ash-ivy woodland, locally with alder (*Alnus glutinosa*) and pedunculate oak, with wood avens (*Geum urbanum*) and wood speedwell (*Veronica montana*). This community occurs in sites where the soils normally dry out between floods, for example on river islands, or on seepages on valley sides. Typically these woods are species-rich with a rich shrub and field layer, often including abundant geophytes, e.g. celandine (*Ranunculus ficaria*), bluebell (*Hyacinthoides non-scripta*), wild garlic (*Allium ursinum*), summer snowflake (*Leucojum aestivum*). Other characteristic species include remote sedge *(Carex remota)* and opposite-leaved golden saxifrage *(Chrysosplenium oppositifolia).*
- Wet willow-alder-ash woodland (WN6) is present at various places, mostly in the western part of the Blackwater basin on waterlogged organic soils.

Area

Most of the alluvial woodlands are relatively small stands, although on the lower reaches more extensive stands occur, albeit rather patchy and broken up by tall herb communities in marshes. The total area surveyed within the SAC is 19.2ha but the actual extent is considerably larger. Non-Annex I ash woodlands and conifer plantations sometimes provide continuity of woodland cover. Objectives should be to increase native woodland size to 3ha for small woods and 25ha for large woods, based on the recommendations of Peterken (1993). However, the topography, land ownership and surrounding land use may mitigate against these targets

Ancient woodland

Three alluvial woodland sites within the SAC are recorded as having been present in part or full on the 1st edition OS maps (1840s). These may therefore be considered as potentially ancient or long-established woodlands (Perrin and Daly, 2010).

Structure and functions

The structure varies between the different woodland types. Gallery woodland is typically rather low, c. 9m in height, and rather open, with the dbh of the principal trees up to 34cm. However, the trees tend to fall over forming a dense tangle of interwoven branches and this, together with a tall and luxuriant growth of herbs often bound together by bindweed, makes access difficult. Regeneration is principally vegetative.

Ash-ivy woodland by contrast forms high forest with ash and oak (*Q. robur*) forming a canopy up to 16m (locally 20m) tall, a well-developed shrub layer of hazel (*Corylus avellana*) and hawthorn (*Crataegus monogyna*) and a well-developed and often species-rich but low growing herb layer. The trees are mostly small, few exceeding 50cm

dbh. Regeneration is poor with the most frequent species being ash and occasional oak, beech and hawthorn.

Dead wood

The amount of dead wood varies depending on age structure and management. Older woods and those hard of access, such as alluvial islands, naturally tend to have more coarse woody debris, although the amount will depend on management which varies with the landowner and factors such as accessibility and theft. There are no figures for the amount of dead wood present within the woodlands within the SAC. However, most of the surveyed sites contain occasional to frequent amounts of dead wood of all types and sizes, although snags were rare. Guidelines as to the amount that is desirable vary according to sources (e.g. Cavalli and Mason (2003)) but a minimum of 30m^3/ha of fallen timber > 10cm diameter and 30 snags/ ha should be considered; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).

Species composition

Details of the characteristic species composition can be found in Perrin *et al*. (2008). The average number of species per woodland type, on a national basis, are as follows:

- Gallery woodlands: vascular plants 21, bryophytes 8
- Ash-ivy: vascular plants 21, bryophytes 11
- Alder-meadowsweet: vascular plants 26, bryophytes 11

There are two species of note: summer snowflake (*Leucojum aestivum*) which occurs locally, although it may be introduced, and slender tufted sedge (*Carex acuta*).

Future Prospects

Hydrology

Periodic flooding is essential for the maintenance of alluvial woodland. By and large the Blackwater has not been drained and flooding occurs periodically. Locally, embankments have been built to contain the water, but many have not been maintained.

Invasive alien species

Invasive alien tree species include beech – mostly in drier sites and sycamore – mostly in moister sites. Laurel (*Prunus laurocerasus*) is locally present in the shrub layer. Himalayan balsam (*Impatiens glandulifera*) is abundant in the herb layer.

Grazing

Grazing animals are a normal part of a woodland ecosystem and appropriate grazing pressure is beneficial, promoting biodiversity.

Where grazing pressure is too high it can damage the herb layer and prevent regeneration; where too low it allows vigorous species to dominate the herb layer, reducing biodiversity and sometimes preventing regeneration. The most common grazers in alluvial woodlands are deer and cattle but the latter are largely confined to the drier sites.

Within the Blackwater SAC alluvial woodlands grazing pressure is mostly light or apparently absent.

Forest management

The woodland stands are mostly in private or Coillte ownership. Few sites have potential for timber production but many sites have been neglected or are only occasionally 'picked over' for timber.

The priority for most sites is the control of invasive alien species, especially sycamore, which is locally abundant.

Conservation and timber production are not mutually exclusive. The principal constraint is that clear-felling is undesirable. Ideally, continuous canopy forestry should be practised but coupe felling or, if the tradition exists, coppicing, are acceptable. Timber production is more likely on drier soils, especially the ash-dominated woodlands, but also locally in alder woods. Many of the very wet sites, e.g. gallery forests, may not be managed at all or subject only to occasional removal of firewood. Management for the production of willow rods would be acceptable.

Impact of agriculture

Threats from agriculture may be direct or indirect. The principal direct threat is clearance and uprooting resulting in destruction of the woodland, although alluvial woodlands subject to frequent flooding are probably not attractive for agricultural reclamation. Indirect threats include fertiliser drift and water pollution, which may increase the trophic status of the wood leading to the stronger growth of nitrophilous species and loss of less vigorous species. However, as these are naturally eutrophic systems the impact is likely to be minimal. Herbicide drift may kill vegetation on the woodland edge.

Urban development

This is a threat principally around towns. Alluvial woodland is more likely to be damaged by infilling, although new planning legislation will hopefully make this less of a threat. Infrastructural development is likely to be localised and restricted in its impact.

Discharges
Discharge of sewage effluent and slurry will pollute the water and have an indirect impact on the woodlands. Rubbish washed downstream is mostly aesthetically unattractive, although it may impact on animal life. Garden refuse may lead to the introduction of non-native and potentially invasive species.

91A0 Oak woodland
Old Oak woodland within the SAC occurs principally on the steep valley sides of the rivers and in particular in the incised valleys of the tributaries. All three sub-types occur, i.e. the bramble-hazel type on better soils and the woodrush-broad buckler fern and bilberry-holly types on poorer soils.

The most abundant trees forming the canopy are oak, both sessile and pedunculate, ash, downy birch (*Betula pubescens*) and beech while in some woods sycamore is prominent. The widespread presence of beech and sycamore indicates former planting and the abundance of pedunculate oak may also indicate planting as the soils are unusually acidic for this species. The shrub layer is dominated by hazel and/or holly with a little rowan (*Sorbus aucuparia*).

Area
15 old oak woodland sites were surveyed, covering c. 263.7ha. One site is 121ha but the rest are mostly under 20ha. The total area within the SAC, however, is considerably larger and there are numerous tributaries outside the SAC that have wooded valley sides.

In general the sites are relatively narrow and fragmented and contained within the valleys. Non-annex I ash woodlands and conifer plantations locally provide continuity of woodland cover. Objectives should be to increase native woodland size to 3ha for small woods and 25ha for large woods, based on the recommendations of Peterken (1993). However, the topography and surrounding land use may mitigate against these targets.

Ancient woodland
All the oak woodlands within the SAC are recorded as having been present in part or full on the 1st edition OS maps (1840s). These may therefore be considered as potentially ancient or long-established woodlands (Perrin and Daly, 2010).

Structure and functions
Typical oak woodland within the SAC consists of high forest with a canopy dominated by oak, ash or birch, up to 23m or more tall, although some stands are considerably lower. In some woods beech is co-dominant. Most of the trees are relatively small with dbh typically

30cm or less, although a few very large trees are present. The shrub layer of holly and hazel varies between 6m and 11m in height. Regeneration is poor and consists mostly of holly, occasional oak and locally more abundant ash and sycamore.

Species composition

Details of the characteristic species composition can be found in Perrin *et al*. (2008). Sessile oak is the principal species but non-native species, especially beech and sycamore, are often present. The slightly more fertile soils in many woods is reflected in the presence of species typical of the oak/ash woodland transition, with species such as wood avens (*Geum urbanum*), yellow pimpernel (*Lysimachia nemorum*), greater stitchwort (*Stellaria holostea*), bramble (*Rubus fruticosus*), wood sedge (*Carex sylvatica*), false brome (*Brachypodium sylvaticum*), sanicle (*Sanicula europaea*), ground ivy (*Glechoma hederacea*) and abundant bluebells (*Hyacinthoides non-scripta*). Poorer soils, principally on the upper slopes, are characterised by bilberry (*Vaccinium myrtillus),* ling heather (*Calluna vulgaris*) and gorse (*Ulex europaeus*). Less common species include Irish spurge (*Euphorbia hyberna*), near its eastern limit, goldilocks (*Ranunculus auricomus*), broad-leaved helleborine (*Epipactis helleborine*) and red campion (*Silene dioica*).

Ferns present on the site include hard fern (*Blechnum spicant*), male fern (*Dryopteris filix-mas*), buckler ferns (*D. dilatata, D. aemula*) and lady fern (*Athyrium felix-femina*). There is a variety of mosses present and the lichen flora includes 'old forest' species that may imply a long continuity of woodland. Tree lungwort (*Lobaria pulmonaria*) is the most conspicuous.

There is one species of note, pale sedge (*C. pallescens*), a relatively uncommon species that is recorded from one site.

Dead wood

The amount of dead wood varies depending on age structure and management. Older woods naturally tend to have more coarse woody debris, although the amount will depend on management which will vary with the landowner and factors such as accessibility, theft, etc. There are no figures for the amount of dead wood present within the woodlands within the SAC but most of the surveyed sites contain occasional to frequent amounts of dead wood of all types and sizes, although snags were rare. Guidelines as to the amount that is desirable vary according to sources (e.g. Cavalli and Mason (2003)) but a minimum of 30m^3/ha of fallen timber > 10cm diameter and 30 snags/ ha should be considered; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).

Future Prospects

Invasive alien species

The principal invasive alien species are beech, sycamore, laurel and rhododendron (*Rhododendron ponticum*). Some stands are more accurately classified as mixed deciduous woodland, although floristically they are very close to old oak woodland. A reduction in the canopy cover of non-native species is required, preferably by gradual, selective removal.

Grazing

Grazing animals are a normal part of a woodland ecosystem and appropriate grazing pressure is beneficial, promoting biodiversity. Where grazing pressure is too high it can damage the herb layer and prevent regeneration; where too low it allows vigorous species to dominate the herb layer, reducing biodiversity and sometimes preventing regeneration. The most common grazers are deer, sheep – principally on unenclosed uplands, and cattle – mostly on enclosed lowlands.

Within the Blackwater SAC grazing pressure is mostly light. Deer do not currently appear to be a problem but with their ever increasing population it is probably only a matter of time before overgrazing becomes a more general problem.

Forest management

The woodland stands are in private or Coillte ownership. Most sites have potential for timber production although many have been neglected or are only occasionally 'picked over' for timber. The priority for most sites is the control of invasive alien species, especially beech and rhododendron, which are abundant in some woodlands.

Conservation and timber production are not mutually exclusive. The principal constraint is that clear-felling is undesirable. Ideally, continuous canopy forestry should be practised but coupe felling or, if the tradition exists, coppicing, are acceptable.

Impact of agriculture

Threats from agriculture may be direct or indirect. The principal direct threat is clearance and uprooting resulting in destruction of the woodland. Indirect threats include fertiliser drift, which may increase the trophic status of the wood leading to the stronger growth of nitrophilous species and loss of less vigorous species, and herbicide drift, which may kill vegetation on the woodland edge. As most of these woodlands occur on steep slopes the threat of conversion to agricultural land is low.

Urban development
These are a threat principally around towns although at least in the lower reaches the topography is a major impediment to development, most of the woodland being on steep slopes. Infrastructural development is likely to be localised and restricted in its impact.

91JO Taxus baccata woods
At Dromana, on the Lower Blackwater near Villierstown, there is a small area (around 4ha) of mixed woodland on a limestone slope in which yew (*Taxus baccata*) is abundant. While there are some patches within this area with a canopy of yew, including some very large trees, the overall cover of yew is <50% and the quality of the stand is generally poor due to the dominance of non-native and invasive species such as sycamore, beech, Douglas fir *(Pseudotsuga menzsii)* and rhododendron. In spite of the heavy shade, pockets of native ground flora persist including hard fern (*Blechnum spicant*), wood sorrel (*Oxalis acetosa*) and great woodrush (*Luzula sylvatica*).

This site does not currently conform to the definition of Habitats Directive Annex I yew woodland. However, appropriate management, including the removal of alien species would ensure the survival of the stand that might eventually develop into yew woodland. Adjacent woodland should also be managed to enable the yew to regenerate and to expand the size of the stand.

References
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John Cross
24 February 2012

Appendix 1

Sites included in the National Survey of Native Woodlands (Perrin *et al.*, 2008), which contain Annex I woodland habitats and are entirely or partly within the River Blackwater (Cork/Waterford) SAC (site code 2170)

91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)

NSNW Site Code	County	Name	Area (ha) within SAC	Possible ancient or long established woodland
1343	Cork	Banteer	5.1	No
1459	Cork	Aghaneenagh	2.3	Yes
1464	Cork	Kilcanway	3.8	No
1488	Cork	Scartbarry	0.7	Yes
1824	Waterford	Dromana	5.5	Yes
1998	Cork	Curraghprevin	1.8	No
		Total area	**19.2**	

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

NSNW Site Code	County	Name	Area (ha) within SAC	Possible ancient or long established woodland
1326	Cork	Ballyhallagh	4.4	Yes
1340	Cork	Curraghmore	18.8	Yes
1354	Cork	Glenville	14.4	Yes
1355	Cork	Philip's Wood	0.2	Yes
1359	Cork	Coolmoohan Wood	5.4	Yes
1459	Cork	Aghaneenagh	12.4	Yes
1488	Cork	Scartbarry	0.8	Yes
1490	Cork	Lisdangan	5.9	Yes
1492	Cork	Lackadarragh South	7.1	Yes
1543	Waterford	Glenmore Wood	36.1	Yes
1626	Waterford	Lismore Wood	121.0	Yes
1819	Waterford	The Grove	8.8	Yes
1842	Waterford	Cladagh	6.8	Yes
1844	Waterford	Rincrew	5.7	Yes
1846	Cork	Ballintray Demesne West	16.0	Yes
		Total area	**263.8**	