Woodland Management and Birds

Part 2. Conservation measures and strategies

In the second of two articles on woodland birds **Rob Fuller** outlines ways of improving woodland for wild birds that can be adapted to suit many different contexts.

Where conservation is one of the interests of the woodland owner, there are many possible actions that should improve habitat quality for birds, and often for other wildlife. The suitability and scale of specific actions will depend on economic considerations, management objectives and the type of woodland; appropriate options would differ considerably in upland commercial spruce forests and lowland ancient woodland nature reserves. In both cases, however, approaches can be adopted that should improve the opportunities for species that depend on the young and late stages of growth.

This stand provides a valuable combination of resources for birds – many nest sites and feeding opportunities for both hole-nesters and shrub-dependent species. Scattered large trees, some apparently open-grown, preside over dense bramble, regenerating trees and shrubs, presumably the result of past heavy thinning. Conservation thinning could aim to create similar structures especially on nature reserves.

Where do conservation priorities lie?

There is something of a divergence of conservation priorities for woodland birds in Britain and mainland Europe. This hinges partly on perceptions of which are 'true' forest birds and partly on the fact that many European species are 'missing' from British woodland. There is a marked gradient of increasing numbers of species as one travels east to Germany and Poland (Mikusiński et al., 2018). Compared with Britain, there is a stronger conservation focus in central and eastern Europe on protecting old and mature stands, and their old forest specialists, exemplified by woodpeckers of which Britain has just three out of the nine species present in eastern Polish forests. Assuming that Britain once offered suitable environments, either many of these birds never reached Britain before it became an island, or they were squeezed out by woodland clearance and modification, possibly several thousand years ago.

In Britain the concern has been more about providing suitable habitats for bird species across the growth spectrum and improving the state of woodland for nationally declining species. The early stages of forest growth that provide nationally important habitats for localised or declining species such as nightingale (*Luscinia megarhynchos)* and nightjar (*Caprimulgus europaeus)* have been just as much a focus of attention as the later stages. This article, therefore, makes a distinction between conservation management most likely to benefit species of the early and late stages of woodland development (see Table 2 in Part 1 in *QJF* July 2021).

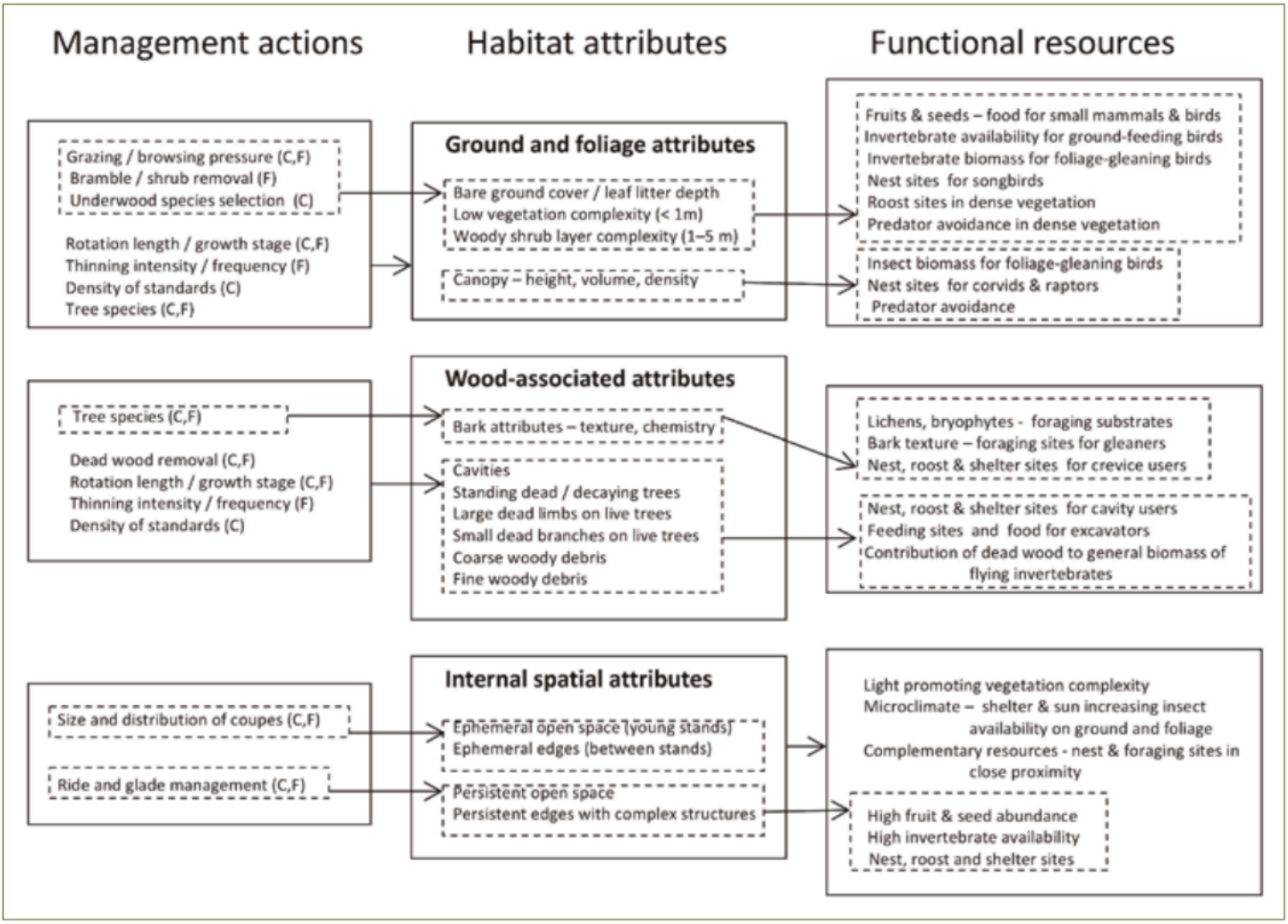

Figure 1. Woodland management actions alter features of the habitat which, in turn, determine resources important to birds. Management actions are indicated as relevant to high forest (F) and coppice (C). Reproduced from Fuller and Robles (2018). A similar version, relevant to a wider range of wildlife was published in Fuller (2013).

Woodland management and wildlife resources

When thinking about interactions between birds and woodland management I always consider the critical resources that different species or guilds of birds require (Fuller and Robles, 2018). Management aimed at improving the quality of habitat, which hopefully leads to a population increase, will seek to enhance one of the following resources for particular groups of species: food, nest sites, roost sites, shelter. Figure 1 offers a framework for thinking about the consequences of management actions for the resources that birds depend on. Three groups of habitat attributes that are relevant to birds lie at the centre of the diagram: (i) ground and foliage characteristics e.g. density of low vegetation, (ii) features associated with wood e.g. bark texture and cavities, (iii) spatial elements e.g. extent of open space and edges. Management decisions determine which of these habitat attributes are present within a stand and their condition. Habitat suitability for any species will then depend on whether its resource needs can be met by the habitat features that characterise the stand. In reality, of course, the linkages between management actions and resources are more complex and subtle than can be conveyed in a generalised diagram of this kind. With sufficient knowledge similar, but unique, diagrams could be constructed for each species of woodland bird.

Habitat management may indeed need to be tailored to the resource needs of a particular species of high conservation importance. Broome et al. (2014) describe how manipulation of thinning and small patch felling may be employed to increase the cover of bilberry (*Vaccinium myrtillus)* that forms a major food of capercaillie chicks (*Tetrao urogallus)*. In the case of the nightingale, a combination of measures would be required to maintain habitat availability. This would involve keeping deer impacts to a minimum and maximising the area of young-growth

woodland at a dense thicket stage, at the same time ensuring that patches of bare ground or short turf were available as foraging habitat (Holt et al., 2012).

More generally, the emphasis of the approaches described below is on increasing the range of resources for woodland birds which, one hopes, will lead to higher diversity and overall abundance of birds, especially in woods that have not been managed for a considerable time. A summary is provided in Table 1. Some of these interventions may also benefit nationally declining species but without systematic trials one cannot be sure. Even where habitat management appears to be delivering appropriate resources, it does not always produce the desired outcomes (Fuller and Robles, 2018). There are several reasons why this may happen. For example, a species could be limited by factors other than local habitat availability, or there might be insufficient 'surplus' individuals in the wider landscape to colonise. Nonetheless, getting the habitat right is a prerequisite for conservation success.

Table 1. Summary of possible conservation interventions

General considerations

- Maintain areas at different stages of growth
  This can be achieved in various ways (see below) to provide habitat for species associated with early and later phases of vegetation development.
- Maintain existing open space
  Semi-permanent canopy openings and their edges, such as rides and glades, offer important feeding areas for birds and should be kept open as far as possible.
- Maintain and enhance wetland features
  Woodland ponds and other damp areas can increase invertebrate abundance. Ponds ideally need to be kept free of shading and periodically desilted.
- Reduce grazing pressure by deer
  High deer pressure in coppice and high forest reduces low vegetation leading to poor habitat quality for many woodland birds; however, within open-canopy wood-pasture low-intensity grazing is an integral part of the system potentially creating high habitat complexity.
- Enhance the native broadleaved component in conifer plantations
  Planting or natural regeneration of native broadleaves can increase diversity of foods and structures for birds.

Interventions for young-growth species

- Shorter rotation length in small areas
  In clear-felling, patches could be cut on shorter rotations to increase the extent of young-growth; successfully used to provide nightingale habitat in southern England.
- Use of group fells within continuous cover systems
  Even where single tree selection is the adopted system, incorporating some regeneration gaps (>0.2ha) can provide habitat for species needing dense thicket regrowth such as garden warbler (*Sylvia borin*).
- Unconventional thinning
  Variable intensity thinning can create novel habitat structures of high wildlife value, including gaps at different stages of regeneration.
- Management of external woodland edges
  The interface of woodland and open country is often a rich zone for birds and insects; allow a shrub-rich belt to develop and cut sections on rotation.
- Management of ride and track edges
  Increasing ride width, reducing shading, and providing scrubby / brambly margins as linear strips or scallops will increase habitat for young-growth species; cut sections on rotation.

Interventions for mature-growth species

- Retentions
  In clear-felling and continuous cover, maintain longer rotations beyond commercial felling age within patches of woodland to provide 'islands' of large trees.
- Designated old-growth stands
  Areas of woodland could be left indefinitely to develop characteristics of old-growth or natural forest.
- Maintaining individual ancient or legacy trees
  Avoid felling trees that are exceptionally old.
- Provision of snags and decaying wood
  Through sensitive thinning and harvesting, retain quantities of standing dead trees and fallen decaying wood; consider increasing numbers of dead trees by ring-barking or injection.

Douglas fir retentions in Thetford Forest carry higher densities of breeding birds than adjacent pre-felling pine stands with several species including firecrests (Regulus ignicapilla) and siskins (Spinus spinus) largely confined to the Douglas fir.

Delivering resources for late successional species

Retaining patches of trees beyond the typical harvesting age is now widely adopted as a conservation measure in various parts of the world. In Britain the use of retentions was advocated by Currie and Bamford (1982) in Welsh conifer forests. Much further evidence has accumulated of the biodiversity value of retentions (e.g. Rosenvald and Lõhmus, 2008; Fedrowitz et al., 2014), although responses of different wildlife groups are complex and depend on the retention size and tree density. There has, however, been no formal assessment of their biodiversity value in Britain.

The retention of individual scattered large trees and standing dead trees (snags) is desirable in woods of all ages and can provide increased opportunities for hole-nesters and species that excavate invertebrates from decaying wood. Both in North American and European clear-felled forests, snags are commonly left within harvested clear-fells for cavity nesters and bark foragers, as well as giving perches for raptors and shrikes. Interestingly, North American woodpeckers are more dependent on snags than is the case for European woodpeckers and many of our secondary cavity nesters prefer living to dead trees.

Within conifer plantations it is certainly desirable to incorporate a native broadleaved component; the benefits probably apply equally to species in the early and later stages of growth. Retention of broadleaved trees was shown by Bibby et al. (1989) to have positive effects on bird diversity and on the occurrence of woodland bird species of conservation importance. Early studies suggested that retaining belts or islands of broadleaved trees at the edges or newly established lowland plantations would help to diversify the bird communities (Williamson, 1972). Current thinking focuses more on encouraging natural colonisation of native shrubs and trees under conifer crops, especially on crop edges, and retaining them in restocks after felling. Birch in particular is a prolific coloniser of high value as breeding habitat for willow warblers (*Phylloscopus trochilus)* and as a seed source for finches.

Catering for young-growth species

The requirements of early successional species or ones that need complex understorey structures, which includes bramble (*Rubus fruticosus)* as well as regenerating shrubs and trees, deserve just as much attention as those of mature woodland. Ensuring that areas of open-canopy young-growth are always available will greatly enhance woodland for light demanding plants, for warmth-loving and nectar-dependent invertebrates, as well as for several birds. In rotational high forest and coppice systems, young-growth will be constantly generated but this is not the case within continuous cover systems unless at least some group fells

Retaining natural regeneration of birch and other broadleaves within conifer crops, shown here in Thetford Forest, can greatly enhance the value of the stands as habitats for birds.

Chiffchaff (Phylloscopus collybita) territories are especially strongly associated with rides and other open spaces within many woods. The dense vegetation growing along their margins also often provides the main nesting opportunities for garden warblers (Sylvia borin) and blackcaps (Sylvia atricapilla) in mature woodland.

are incorporated. Most commercial thinning delivers little conservation benefit because the canopy is rarely sufficiently opened to greatly increase woody understorey regeneration (Fuller, 2013). However, 'variable intensity thinning' or 'thinning for habitat diversity' (Harmer et al., 2010) can create spatially complex woodland with much variation in canopy cover including glades of different sizes. Conservation thinning of this kind seems to be rarely adopted, even on nature reserves, but is worth serious consideration where timber production is not the highest priority. Thinning has been shown to have complex effects on bats (Carr et al., 2020), and while some common species may benefit from periodic thinning, this may reduce roost sites for rarer species such as Barbastelle (*Barbastella barbastellus)*. Similar assessments are needed for a wider range of wildlife including birds.

In virtually all types of woodland there are opportunities to provide a continuous supply of young-growth along tracks and rides. Various prescriptions have been developed for managing woodland rides, some of which are mainly appropriate for nature reserves (Warren and Fuller, 1993). However, a simple approach to create nesting and feeding sites for many birds is to leave a strip of 2 to 5m each side of the ride unplanted, and allow bramble and other deciduous woody regeneration to develop a thicket structure over several years. This should be cut on a rotation of about 7 to 10 years depending on site conditions and available resources. Shorter rotations of 4 to 7 years may be preferred where the aim is to create a mosaic more favourable to invertebrates. It is important to cut on a piecemeal basis so that different stages of growth are always present. Such habitat could be provided in scallops rather than as a linear strip. The north side of rides and tracks that run east-west offers especially good opportunities due to their solar exposure which can lead to higher quantities of insects, flowering plants, and berries. The external edges of woods are often also rich in wildlife because the vegetation complexity can be high (Melin et al., 2018). Allowing banks of bramble and shrubs to proliferate at the woodland edge can greatly benefit both birds and invertebrates.

Concluding thoughts

Does management for birds deliver wider conservation benefit?

The notion that one particular wildlife group can act as an indicator for other groups of wildlife is appealing but highly simplistic. A wood that supports a diverse bird community or a high density of birds is not necessarily rich in other wildlife groups, or likely to support important populations of species other than birds. Many plants and invertebrates depend on very specific resources and microhabitats that are strikingly different to those required by birds. Ecologists are increasingly undertaking complex multi-taxa studies of the effects of forest management that will generate better understanding of these divergent requirements (e.g. Hilmers et al., 2018; Paillet et al., 2018).

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Furthermore, unlike many weakly dispersing plants and invertebrates, birds are generally less sensitive to the history of a wood. Ancient woods, although hugely important for biodiversity, have marginal relevance to bird conservation because the great majority of European species are capable of colonising suitable woodland habitat providing it lies within the geographical range of the species and there are sufficient surplus individuals to establish a new local population. Whilst it would not be sensible to advocate general conservation management in woodland

solely on the basis of the requirements of birds (nor indeed for any one group of plants or invertebrates), the principles outlined here will go a long way towards creating a wider range of habitats for other wildlife.

Habitat heterogeneity and complementary woodland structures

No two woodland species have exactly the same requirements and no two woodlands are identical in their conservation opportunities. Within any site, it would obviously be impossible to implement the optimum management for every single species. Increasingly, conservation management approaches are likely to be widely adopted in which interventions embrace the needs of a wide range of wildlife groups, but that also take account of the needs of any scarce or especially exacting species that are present. Achieving habitat complementarity and heterogeneity is an important principle. This recognises that the availability of different kinds of woodland – defined in terms of vegetation structures and tree species – underpins high levels of biodiversity by supporting very different assemblages of plants and animals.

The use of more than one silvicultural system can do much to increase the range of habitat options for wildlife and the adoption of measures such as retentions and variable intensity thinning can add to this habitat diversity. The maintenance of complex vegetation structures along ride edges and the outer margins of woods contributes further habitat heterogeneity. Such a framework of conservation planning could potentially be applied at the scale of individual large woods or across different woods in a particular locality. For example, some stands or woods might be managed on a single tree selection basis and others by small-scale patch felling. Adopting similar thinking, Broome et al. (2017) suggested that a small number of stand structures could be identified that would, between them, potentially provide the resources to support most species of breeding woodland birds in Britain. The stand types are:

Provided they are not too heavily shaded, ponds in woodland can add much to the habitat diversity for wildlife. Many birds feed in the marginal vegetation of this pond in Bradfield Woods National Nature Reserve, Suffolk, and the pond itself is an important habitat for newts and invertebrates.

- Low tree height and dense undergrowth within 2m of the ground – typically a temporary structure developing after clear-felling or group-felling.
- Low tree height with a dense upper shrub layer 2-5m above ground – occurs in the late stand initiation and early stem exclusion phases.
- Mature tall stands with multiple strata composed of shrubs and trees of different ages – potentially created under continuous cover management.
- Mature stands with fairly closed canopy and open understorey – typical of western grazed oakwoods, which carry a particularly distinctive bird community.
- Open canopy with open-grown mature trees – a wood-pasture structure maintained by grazing.

More old-growth and novel management?

Accompanying the recent enthusiasm for rewilding there have been growing arguments that Britain needs more old-growth or 'natural' forest. I would argue that large old-growth stands allowed to function indefinitely in a natural way, with no manipulation of grazing or tree composition, should form part of the suite of woodland structures in Britain. There is no certainty about the types of biological communities that could become established in such stands over long periods of time. As the Lady Park Wood experience demonstrates, the outcomes may diverge somewhat from preconceived ideas of the wildwood (Peterken and Mountford, 2017). Nonetheless, the availability of more areas of 'naturally functioning' non-intervention woodland would offer baselines against which the effects of different kinds of management and degrees of intervention could be measured.

The bird interest of many of our woodlands could be improved by management, especially through the provision of gaps and young growth. This applies especially to those

that have remained unmanaged for extended periods and which are often marooned in a heavily shaded stem exclusion structure. It is also relevant to the recent small farm and amenity plantations that frequently have received scant attention since their planting in the last century. Novel management approaches, especially the adoption of conservation thinning to create patchworks of trees at different stages of growth and semi-permanent glades, could greatly improve the biodiversity value of such woods. Finally, measuring how wildlife responds to such treatments is important. Tests of responses to interventions should not be confined to 'before and after' studies of particular sites but need to make contrasts with different kinds of management and with rewilded woodland. There is still much to learn.

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