

BIRDS AND WOODLANDS

By Dr. BRUCE CAMPBELL



Tawny Owl, *Strix aluco*, roosting in an elm tree



Figure 1. Robin, *Erithacus rubecula*

BIRDS AND WOODLANDS

What is a Woodland Bird ?

Britain has been so denuded of woodland for many years that its birds have had to adapt themselves to an environment that is at best only partially wooded; in other words, to the now traditional landscape of fields and tree-lined hedgerows, dotted with small spinneys, shelter-belts, parks or policies and villages. But since much of the country was once covered by broadleaved forest of oak and other species, an important element in our bird population is, in fact, of woodland origin.

But what is a woodland bird ? A reasonable definition seems to be : a species which, during all or part of the year, can fulfil all the demands of its life within a woodland habitat. For example, though the blackbird is now ubiquitous, it can feed, sleep, sing, preen, mate, build its nest and rear its young without ever leaving the wood, whereas a rook, though it nests in woods, usually small ones, spends much of its feeding day in the fields, the civilised counterpart of primitive steppe or savannah. It—and several others of our common birds—is really a species of the edge or “ecotone” between two major habitats : the forest and the open, grassy plain.

The wood itself may be divided into four main zones : field layer, shrub layer, the trunks and main branches of the forest trees, and finally their canopy or crowns. There can be many further sub-divisions but these four enable us broadly to classify the “niches” used by each bird for different activities. The robin spends practically all its time between the field layer (nesting, feeding) and the shrub layer (singing, preening, sleeping) ; the tree-creeper finds all its niches in the trunk and main branches ; while the pied flycatcher may use all four zones : feeding in the canopy, singing, displaying and nesting in the trunk and branch zone, roosting in the shrub layer, feeding and collecting nesting material in the field layer. Crossbills and some smaller

finches are among our few canopy birds, in which we are poorly off compared to North America, though we have relatively more hole-nesting small birds.

To confirm our diagnosis of woodland origins we have only to visit neighbouring lands across the Channel where large tracts of hardwoods have been preserved, or even the remaining areas of old oak in the Forest of Dean, the New Forest and other survivors of our sylvan past. Here many of the “common or garden” resident birds of suburbia will be found in their natural habitats. The scrub woods of northern and western Britain also have a strong bird fauna during the breeding season, but in them the proportion of summer visitors to residents is much higher than in the lowlands and they may be almost deserted during the winter.

Our only native conifer areas are the “black woods” of Scots pine in the Highlands and some small stands of yew on the chalk of southern England. A handful of species are characteristic of the old pinewoods and have spread locally into new plantations; but colonisation of our forests of introduced conifers has generally been from neighbouring hardwood areas. There is no evidence that any continental birds, except crossbills and possibly siskins, have invaded them and remained to breed.

Our woodlands, old and new, therefore provide an interesting situation for the ornithologist and for the increasing number of foresters who are also naturalists. Now that wild life is coming to be accepted as an amenity, to put it no higher, there is no reason to suppose that we shall lose any kinds of birds through silvicultural practices, and we might even gain some.

The Birds of Mature Oakwood

Many changes have befallen our native woods since the first prehistoric settlers made

their clearings, but assuming, as most botanists do, that the lowland forests were predominantly of oak, with other species in mixture or in pure stands where conditions particularly favoured them, it seems best first to describe the community of birds as it exists today in typical mature oakwood, and then to go on to special characteristics of the bird life at earlier stages and in woods dominated by other species. Emphasis throughout will be on those which breed in each habitat ; our woodlands receive few winter or passage visitors compared to our shores and lakes and even our farmland.

Oakwood, of course, may cover a variety of conditions from *Quercetum roboris*, the community dominated by pedunculate oak on heavy clay, to *Quercetum petraea* dominated by scrubby sessile oak on rocky hillsides. But, due to mixtures and hybridisation, there is a fairly recognisable type of wood with a field layer of brambles, bracken and bluebells, and a shrub layer of holly and various small deciduous trees, which occurs widely in Britain and of which there are still good examples in the Dean and New Forests ; this is the habitat where the best developed breeding community of woodland birds may be found.

Here we follow the classification of the *Handbook of British Birds*, which is convenient for our purpose.

The crow family (*Corvidae*) is poorly represented in typical oakwood because most of its members are really birds of the woodland edge or wooded savannah. But the primary diet of the Jay is acorns and its European distribution corresponds to the great oakwood areas ; its habit of burying food makes it quite an important disseminator of oak in natural woodland. Many open woods attract the Carrion and Hooded Crows (now regarded as races of the same species) and where old trees have become hollow a colony of Jackdaws may establish itself. In the west of Britain Ravens may nest in oakwoods, though they prefer conifers which give better cover early in the year.

The Starling (family *Sturnidae*), like the jackdaw, is an opportunist and has penetrated woods on a large scale in many parts of the continent and in Britain, nesting in old woodpecker and other holes, often to the detriment of smaller birds. But it is generally considered to be a beneficial bird in the forest and Dr. H. Bruns cites a small area of spruce which had been defoliated by the larvae of a sawfly *Pristiphora abietina* and was entirely cleared of the pest by starlings. Exceptionally, at a big starling roost, tree growth may be checked by the accumulation of the birds droppings.

The typical finches of oakwood (*Fringillidae*) are the shy and local Hawfinch in the southern half of Britain and the Chaffinch, probably the commonest and most widespread breeding bird in British woods ; both are summer visitors, found in other habitats during the winter. The chaffinch's song, uttered from a spreading bough in February, is one of the first signs of the return of spring to the forest ; and its lichen cup blends into the fork of a branch or hangs in a trail of honeysuckle. The Bullfinch is also found in oakwoods with thick shrub and field layers.

Members of the *Motacillidae*, which includes the pipits and wagtails, are usually adapted to open habitats but the Tree Pipit occurs in open oakwoods, especially of sessile type, in the north and west. It needs space for its full descending song-flight but in woodland often sings an abbreviated form from a perch below the canopy, while the nest is hidden in the field layer, often under dead bracken or a hair-grass tussock.

The titmice (*Paridae*) and their allies are the most important and numerous small residents of our woods. In open winters they may find enough natural food to survive there, but in a hard spell they are soon drawn to the nearest houses ; if hard weather is prolonged, many may die. The annual fluctuation in numbers, especially of Great Tit and Blue Tit, generally the two commonest species in lowland oakwoods, has been measured since the war near Oxford and in the Forest of Dean, and for



Figure 2. Nuthatch, *Sitta europaea*, at a nest box

much longer in Holland. The Coal Tit is more typical of highland scrubwoods ; the Marsh Tit occurs in lowland woods but not in large numbers. All nest in holes and can be attracted to nestboxes, which makes them easier to study.

The Long-tailed Tit builds its unique "bottle" nest in the forks of oaks, where it matches so perfectly that this seems to be its ancestral site rather than the brambles and low bushes which it uses in hedgerows. The Treecreeper (*Certhiidae*) is perhaps the most specialised to a woodland life of all our birds, being highly adapted to search tree bark for insects, spiders, their eggs and pupae ; it also nests behind dead bark but will occasionally use ordinary nestboxes. So will the Nuthatch

(*Sittidae*), which in natural sites reduces the diameter of the hole by plastering it with mud. Since nestbox holes are already cut to size, its talent runs riot on the inside of the lid and along the cracks between the sections. The last member of the group, the Goldcrest (*Regulidae*), is usually considered a conifer bird ; but it occurs widely in oakwoods, nesting on ivied trunks and in scattered yews.

The nuthatch and marsh tit are more or less confined to England and Wales, though the tit just reaches the south of Scotland. The other six species are found well into the northern Highlands, in Ireland and in the Isle of Man, which all have similar reduced woodland bird communities, presumably

because they were cut off before several species had worked their way northwest at the end of the last glacial period.

Our two flycatchers (*Muscicapidae*) have quite distinct habits. The Spotted Flycatcher is a summer visitor to highland scrubwoods, nesting where roads and rivers make breaks in the canopy and give it good perches for aerial sallies after flies ; its well-camouflaged nest fits on branch snags and rock ledges. The Pied Flycatcher is characteristic of sessile-type oakwoods from Devon to the central Highlands of Scotland ; a cavity-nester, it is one of the easiest birds to attract to nest-boxes and substantial populations have been built up in this way in a number of the Commission's forests. Like the titmice and redstart it feeds its young largely on the larvae of defoliating moths and, after they have pupated, takes some of its prey off the ground.

Two groups of warblers (*Sylviidae*) are represented in oakwoods : the leaf warblers, genus *Phylloscopus*, and the typical genus *Sylvia*. Of the first, the Wood Warbler is the only British bird really confined to closed-canopy woodland for breeding ; it is found in low scrub well up the hills in Wales, but even there the ground flora is sparse and shaded. The Willow Warbler has a far wider range of habitats and occurs mainly in open woods, as does the Chiffchaff, which is really an edge species. But oakwood, with thick bramble cover in the south, will probably hold it as well as the Blackcap and Garden Warbler of the genus *Sylvia*. In the north the blackcap becomes local or absent but the other two extend to the central Highlands and further, becoming associated with rhododendron shrub-layers. The Whitethroat, another edge bird, nests occasionally in open woods with brambles.

The thrushes (*Turdidae*) are the last big passerine family to be considered ; the Mistle Thrush is a typical edge species found in areas of broken canopy where it builds nests which blend beautifully in the forks of oaks. Song Thrush and Blackbird are original woodland birds now adapted even to treeless

islands ; where the shrub layer is absent, the blackbird nests on the ground or in banks while the thrush prefers rocky ledges or creepers like honeysuckle ; both use the epicormic shoots of oak. Song thrushes seem relatively commoner in the northern scrub woods, blackbirds in the pedunculate woods of the south. Two winter visitors, Fieldfare and Redwing, sometimes haunt oak woods for part of the season and are responsible for spreading holly and other berry-bearing shrubs.

The Redstart is the fourth of a group of summer visitors—the others are tree pipit, pied flycatcher and the wood warbler—characteristic of scrub oak woods in Wales and the north but virtually absent from Ireland, though there seems no reason why they should not colonise similar habitats there. They also show increasing specialisation in habitat, the pipit being the most tolerant, the flycatcher the most exacting. Extensive observations all over Britain suggest that the flycatcher occurs only where wood warblers and redstarts are already present, though the latter is a competitor for nest-sites and takes to nest-boxes readily. Some Robins, like the titmice, remain in woodland in winter as long as the weather is open, but many have a short regular " migration " in autumn from the woods to the neighbourhood of man.

The Wren (*Troglodytidae*) ranges in the British Isles from sea cliffs to over 3,000 feet, but a good proportion of the population must nest in woods ; in oakwood they build in low brambles and dead bracken, in epicormic shoots and the roots of fallen trees.

Our woods are poor in species outside the passerine order. Of the three woodpeckers (*Picidae*), the Great and Lesser Spotted inhabit oak woods where they do not seem to compete with each other. The smaller bird feeds in the higher branches and twigs, while the bigger one works lower down and deeper into the trunk ; it also takes seeds and nuts and is not above breaking into nest-boxes and taking the brood. The Lesser Spotted woodpecker sometimes joins wandering tit flocks in winter ; it

is confined to England, becoming very scarce in the north, and Wales. The Great Spotted woodpecker has penetrated, probably re-colonising after deforestation, about as far as trees grow in Scotland. The Green Woodpecker is now an edge bird, though this may be a recent development ; it is also spreading north in Scotland, but there are no woodpeckers in Ireland.

The Tawny Owl (*Strigidae*) is the owl of oakwood ; it will nest in chimney-type boxes

and by this means a population and its relationship to its main prey was studied near Oxford for 12 years. Its breeding success depends largely on the numbers of bank voles and wood mice. It does not occur in Ireland, whereas the Long-eared Owl is widespread there.

The Sparrowhawk (*Accipitridae*) has recently become scarce, rare or even extinct in many woodland areas, probably due to the combination of shooting with the indirect effect of



Figure 3. Blackcap, *Sylvia atricapilla*, feeding young

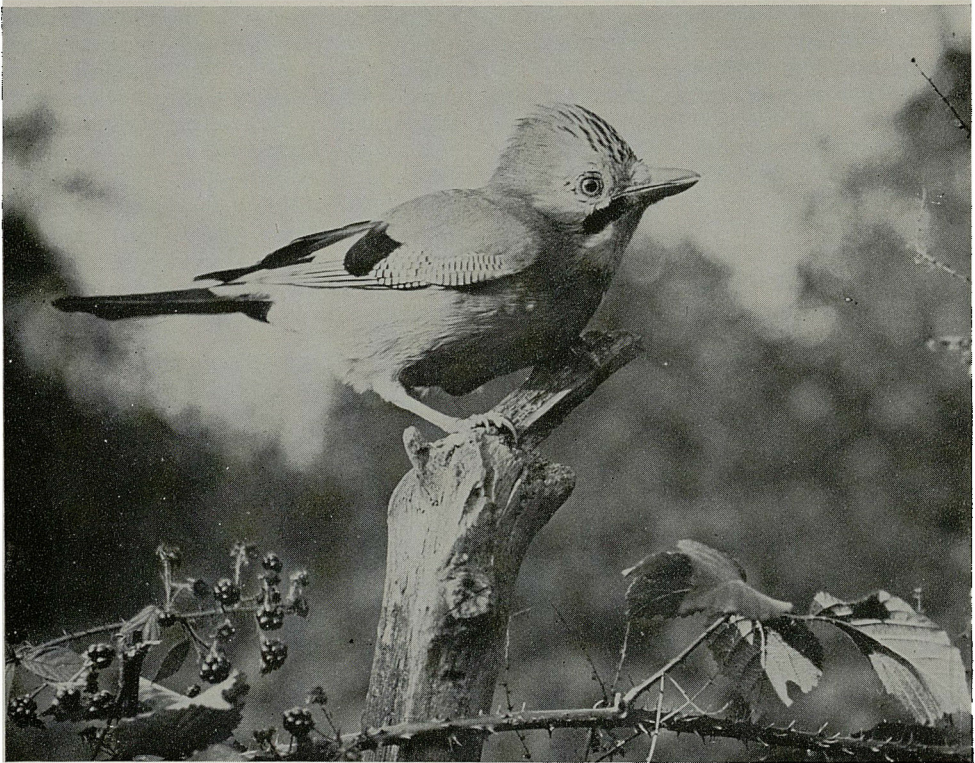


Figure 4. Jay, *Garrulus glandarius*

poisonous chemicals, because it preys on small birds which may take dressed seed. Since the autumn of 1962 it has been protected in Britain ; it is still relatively common in Ireland. The Buzzard, typical of western and northern scrub woods, has decreased from another cause ; myxomatosis cut off the young rabbits which were the principal food of its broods. At one time after the 1939-45 war it seemed likely to spread all over Britain, whence it had been banished, as from Ireland, by rigorous game preservation. The Red Kite, one of our rarest breeding birds, is particularly associated with hanging oak woods in those Mid-Wales valleys which have been its last stronghold for about eighty years.

In terms of biomass or total weight, the

Woodpigeon (*Columbidae*) is probably the most important single species in all types of woodland ; it takes acorns greedily and is found in oak woods throughout the British Isles though its breeding density is not as high as in other habitats.

The Stock Dove, like the jackdaw and starling, is an opportunist, sometimes taking to old woodpecker and other holes deep in the woods ; it is absent from most of the Scottish Highlands and west of Ireland.

The Woodcock (*Scolopacidae*) is the only wading bird adapted to a forest habitat and is characteristic of oak woods with bracken and thin brambles both in summer and winter, when there is a large immigrant population. Finally, the introduced Pheasant (*Gallidae*)

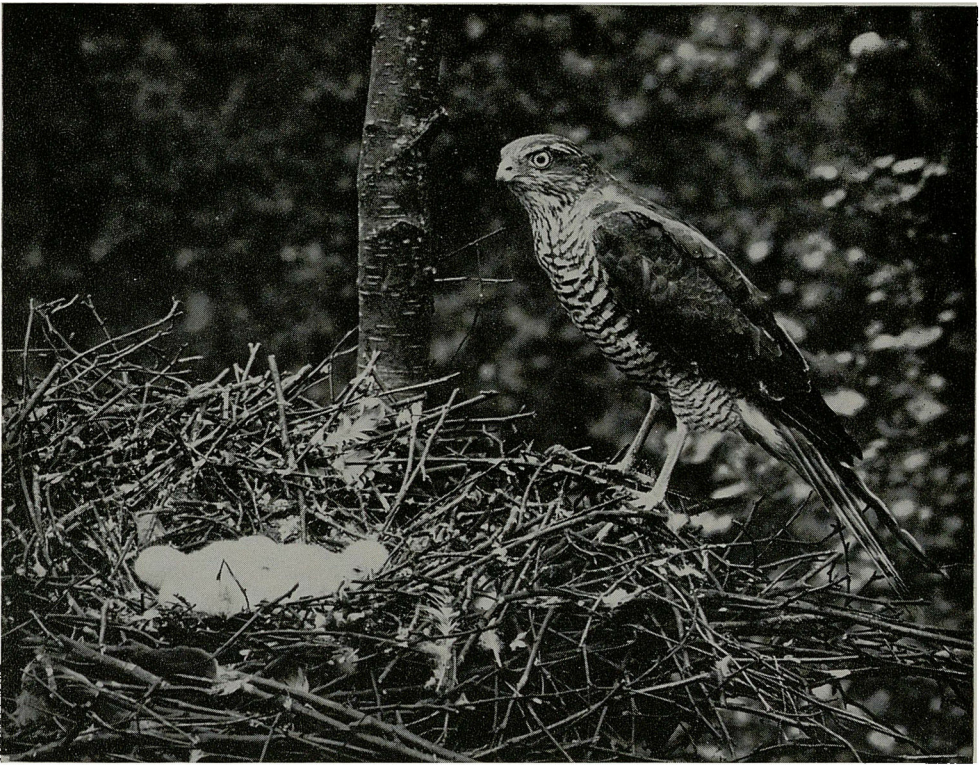


Figure 5. Sparrow Hawk, *Accipiter nisus*

manages to survive in small numbers, where not specially reared, in oak woods with thick cover.

Birds of Other Oakwoods

Those who complain of the lack of bird life in planted coniferous forest do not realise that the younger age groups of oak, from the formation of the canopy up to 80 years or older, have a poor fauna. Unless nest boxes are provided, hole-nesting species are almost entirely absent and there is usually a lack of shrub and field layers to attract warblers and thrushes ; in winter these woods may be quite deserted. For these reasons they have been little visited by ornithologists and few data are available on the numbers and species present, except for W. B. Yapp's counts in

parts of Wyre Forest. Less than twenty species were present in summer in young oak and birch up to twenty-five years old. In older oak about forty feet high there were several more species, but their numbers were affected by an under-storey of beech, which noticeably reduced the tree pipits and wood warblers.

The traditional coppice with oak standards of southern England, on the other hand, has a rich bird life. Many of the species noted in the main oakwood community occur and are joined by edge birds such as Rook and Magpie (*Corvidae*), Nightingale (*Turdidae*) and Dunnock or Hedge Sparrow (*Accentoridae*) among the passerines. Where the Dunnock is, the Cuckoo (*Cuculidae*) will also

be ; Kestrel and Hobby (*Falconidae*) may lay in an old crow's nest and in a river valley there may be a colony of Herons (*Ardeidae*).

Birds of Beechwood

Next to oak, the two most important broad-leaved habitats in terms of area are beechwood in the south and birchwood in the north and west. Beech, as a heavy shade-bearer, suppresses the field and shrub layers, except for a few specialised plants and occasional yews. The result is an extremely weak community of breeding birds. When the trees are over-mature, the ubiquitous chaffinch and wood-pigeon occur, with some titmice and their allies, especially the nuthatch ; while stock doves and woodpeckers exploit rotten branches and cavities. The wood warbler, which likes a bare floor, is found locally in these southern woods, quite cut off from its main habitats in sessile oak and other scrub woods.

But in autumn and winter, if there has been a good mast, the position is different ; the beechwood becomes the chief feeding place for great, blue, coal and marsh tits, nuthatches and chaffinches, which are joined by their close relative the winter visitor Brambling. If beech really was widespread in the ancient forests of southern Britain its fruits may have been the chief standby of this group of birds ; and it will be interesting to study the effect of the fairly large new acreages now being established.

Birds of Birchwood

Throughout highland Britain natural birchwoods still cover considerable areas, often mixed with oaks, ashes, alders, rowans, aspen, holly, hawthorn and hazel, varying according to local conditions. The bird life is basically that of sessile oakwood with the species that do not like too much shade, especially tree pipit and willow warbler, becoming prominent. Two new ones are the Redpoll (*Fringillidae*) and Black Grouse (*Tetraonidae*) ; redpolls may nest in various types of scrub and in young conifers, but birch seed is one of their principal foods outside the breeding season ;

local in the south, they are common over much of the Scottish Highlands and in Ireland. The grouse is a moorland edge rather than a woodland bird, but we shall meet it in the conifers too.

The Willow Tit (*Paridae*) is found in areas of old birch in the north of England and south of Scotland ; it is also associated with alders but in the south of England it is a bird of dry elder scrub in mixed woods ; in all these habitats the presence of rotten, easily bored wood is the common factor. Finally, the redwing may be noticed again here as it seems to be nesting regularly in very small numbers in northern Scotland ; in Scandinavia it is typical both of birchwoods and conifers.

Other Broadleaved Woods

Alderwood, of which small areas exist in river valleys and by lochs, lakes and meres as wet "carr" or "gwern", has no distinctive breeding birds ; since it matures quickly and its timber rots easily, it is favoured by many hole-nesters. In winter it is the regular habitat in which to look for feeding parties of Siskins, redpolls and sometimes Goldfinches (all *Fringillidae*), often accompanied by blue tits.

The bird life of British ashwoods at any season is not remarkable ; it resembles a weak oak or birch community. Marsh tits often appear to be commoner than usual in relation to other titmice. Such proportional changes in the numbers of regular inhabitants are of interest to the specialist as indicating subtle ecological differences in habitats, but have hardly been studied as yet.

No other broadleaved tree dominates areas of woodland but there are many small woods, usually of artificial origin, composed of a mixture of species, both hardwood and conifer. They may therefore have a rich fauna, comparable to that of the best oakwoods, but do not contain any birds not already mentioned. There are also important areas with sylvicultural mixtures of two or more species which will entail modifications in the bird population, as Yapp's observations on oak and beech in



Figure 6. Tree Creeper, *Certhia familiaris*, catching grubs on a vertical tree trunk

Wyre Forest showed. Here again is a virtually unexplored field for the forest ornithologist.

Birds of Conifer Forest

The bird life of our remaining native woods of Scots pine in the Highlands has attracted attention for many years because of the survival of two species unknown elsewhere in Britain ; the Scottish Crossbill (now regarded as a race of the Parrot Crossbill, *Fringillidae*) and the Scottish race of the Crested Tit (*Paridae*) ; both have been the subjects of leaflets in this series. Formerly the siskin was almost in this relict category but it has now spread not only throughout the Highlands but into several parts of England, North Wales

and generally in Ireland. It is the most striking example so far of colonisation of the new forests by a typical conifer bird, though it is possible that, at least in the south, winter visitors may have been partly responsible.

The fourth generally quoted bird of the Caledonian pinewoods is the Capercaillie (*Tetraonidae*), which is a special case, having been reintroduced from Sweden to Perthshire in the nineteenth century ; it too has been the subject of a leaflet.

But concentration on rarities neglects an interesting community of commoner birds. Owing to their age the most characteristic of the "black woods" are very open and this allows in several species which are really edge



Figure 7. Buzzards, *Buteo buteo*

birds, like crow, magpie (scarce) and mistle thrush, and even heath and moorland birds, like the Yellowhammer (*Emberizidae*) and Meadow Pipit (*Motacillidae*), while the pipit brings in the cuckoo. Willow warblers are extremely common, nesting in the long heather and blaeberry (*Vaccinium*) which are the main elements in the field layer.

The shrub layer is of juniper and this provides nest sites for bullfinch, chaffinch—the commonest of all, goldcrest, song thrush, blackbird and wren. Crossbills, siskins and redpolls inhabit the canopy and there are also some Greenfinches, here living in an original habitat. Coal tits, nesting in holes in the ground, crested tits, nesting in rotten pine

stumps, and treecreepers ; spotted flycatchers, redstarts and robins complete the typical passerines. The great spotted woodpecker has recolonised Strathspey in the past half century; long-eared and tawny owls both occur and with sparrowhawk and buzzard are the chief birds of prey, though we can now add the Osprey (*Pandionidae*) which has nested in pines since 1959 and is truly characteristic of open lake-studded pinewood in Scandinavia. The woodcock is numerous; woodpigeons, of course, are present and the game birds are capercaillie and black grouse.

Often the pines are mixed with birches and this adds other titmice and wood warblers to the community.



Figure 8. Woodcock, *Scolopax rusticola*, and its eggs in a pinewood



Figure 9. Song Thrush, *Turdus ericetorum*, bringing food to its young

Birds of Yew-wood

At the other end of Britain are the dense yew brakes of Hampshire and Sussex ; the only published lists of their birds are those of W. B. Yapp. Woodpigeon and chaffinch emerge as easily the commonest species in summer ; blackbird, robin and wren are also numerous, as is the goldcrest, the typical bird of churchyard yews. Many of the other birds recorded are edge species, such as the Linnet (*Fringillidae*) and Turtle Dove (*Columbidae*), both from low open scrub or heathland.

The New Forests

Between the pinewoods of Sutherland and the yews of the southern chalk lie over a million acres of "new" conifer forest, made up of a wide range of species. Some are Europeans : Scots and Corsican pines, Norway spruce, and common larch. From further afield come Japanese larch and the North Americans : Sitka spruce, Lodgepole pine, Silver Firs, western Red Cedars, Douglas fir and hemlock. The use of these species is controlled by soil and climatic conditions, rain-



Figure 10. Siskin, *Carduelis spinus*, on its nest on a pine branch

fall, aspect, exposure and altitude, so their proportions in different parts of the country vary a great deal. But, so far as present observations go, the breeding birds that have colonised them occur in much the same order of abundance everywhere: chaffinch, goldcrest and coal tit are the commonest passerines with wood pigeons from the "non-passerines". Most of the less specialised members of the oakwood community occur somewhere. The exceptions are: hawfinch (though it is found in park-type conifer woodland), marsh tit,

nuthatch, wood warbler and lesser spotted woodpecker. Nest boxes assist the titmice to colonise.

The most interesting arrivals are the redpoll and siskin already mentioned and the Common Crossbill, which periodically invades from the continent and establishes itself for breeding mainly in old tree lines and clumps. With these exceptions the bird population of our new forests has been recruited from the surrounding broad-leaved woods.

Birds of Newly Planted and Felled Woodlands

Since an area once planted is classified as "forest", it is permissible to look briefly at the bird life which is attracted in the early stages of afforestation. The effect of preliminary fencing is to encourage the ground vegetation so that a lush heath or grass-heath flora appears.

Typical small birds at this stage are Whinchat and Stonechat (*Turdidae*), Grasshopper Warbler (*Sylviidae*) and, provided there are a few high perches, tree pipits. If there is a vole plague the Short-eared Owl (*Strigidae*) may appear in numbers. Both in England and in Wales new plantings have encouraged the Montagu's Harrier (*Accipitridae*); while in Scotland the Hen Harrier has benefited from protection and the increase in voles, etc., where grazing has ceased. Kestrels hunt over them and there is good cover for game birds. As the young trees grow, willow warblers arrive and if some bushes are left, other warblers, song thrush, blackbird and dunnock join them. In the Forest of Dean such areas have given a welcome sanctuary to the Red-backed Shrike (*Laniidae*). During these early years it does not matter much whether the planted crop is broad-leaved, conifer or a mixture because it is the heath and bush vegetation which is important to the birds. But conifers in the immediate pre-canopy stage are often colonised by redpolls and turtle doves.

The first years of the closed canopy are probably those with the lowest population of birds; but a slow infiltration of woodland types begins with the first cleanings and thinnings.

Felled areas are notable for two species: Woodlarks (*Alaudidae*), which sing either on the wing or from a tree and are confined to southern England, and Nightjars (*Caprimulgidae*), decreasing but still of general distribution; they also nest in clearings in tall woodland.

Many other birds occur in woodland due to the presence of other habitats nearby. Mallard (*Anatidae*) often nest well away from water in

bracken or other field layers, and Common Sandpipers (*Scolopacidae*) may haunt the wooded edge of lochs or rivers. The Stone Curlews (*Burhinidae*), which clung to their flinty East Anglian brecks for some years after afforestation and still nest in some numbers on open rides or fire-breaks, are another well-known example. In a country where habitats are as entwined as in Britain, there are probably cases of almost every land-bird and of many water-birds breeding or feeding within a wood or planted area.

Birds and Forestry

At one time it was believed that a fairly simple balance sheet could be drawn up to show the value or otherwise of birds to the farmer and forester. Those that ate grain, buds or fruit were "bad", those that ate insects (by which was meant practically all invertebrate animals) were "good". But the solution is not nearly so straight-forward because birds change their diets through the seasons, because grain-eaters also take weed seeds and may feed their young on insects, because "insectivorous" birds may eat larvae that are already parasitised or predatory kinds which are busy destroying pests.

As regards forestry, even their most fervent supporters agree it is unlikely that insect-eaters can do anything to check a plague of defoliating caterpillars once it is really under way. One of the most impressive sights during such outbreaks in oakwood is an attack by hundreds of rooks, jackdaws and starlings, assisted in some areas by gulls, on the crowns of the trees. Here are birds, which are normally regarded with mixed feelings, apparently doing good on a big scale. But has their intervention really achieved very much? By the time they arrive, the larvae are well-grown and have taken their fill of the oak leaves. Some have already pupated and those species which do so in the ground are safe.

Because of the confidence, particularly of German foresters inspired by Baron von Berlepsch, that a high population of insectivorous birds was beneficial both to hardwoods and conifers, nest boxes, artificial nest

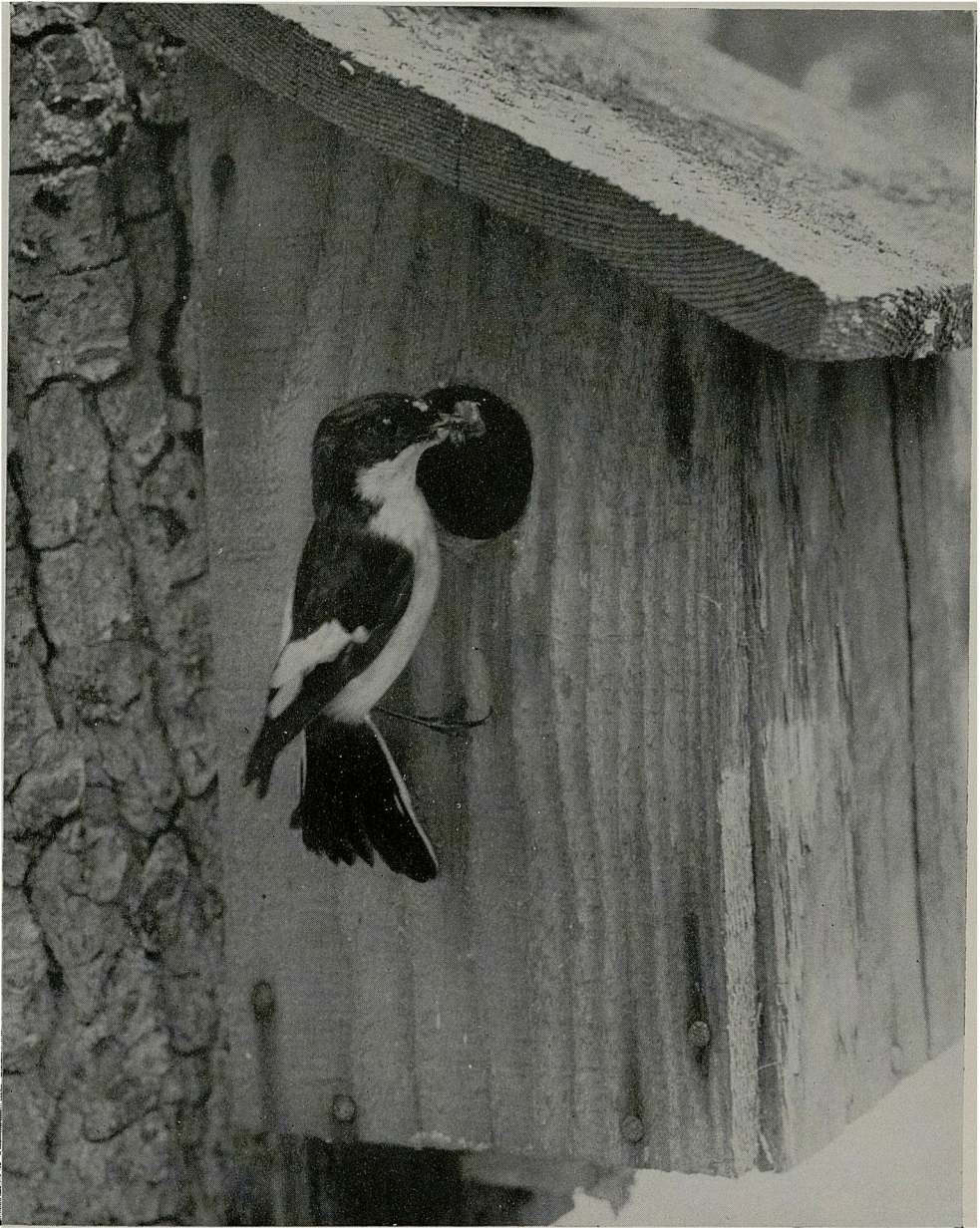


Figure 11. Pied Flycatcher, *Ficedula hypoleuca*, taking a grub to its nestlings in a nest box

sites and other devices to attract birds were advocated long before any critical research was done. The boxes put up in the Forest of Dean in 1942 were meant to attract birds to the neighbourhood of Nagshead nursery ; after the war many hundreds of boxes were put up elsewhere, as far north as Culbin, in Moray, but their maintenance depended on the enthusiasm of individual officers and foresters. In 1948 the Edward Grey Institute of Field Ornithology at Oxford began an investigation of the relationship between titmice and their food, at first mainly in oak woodland, but from 1952 to 1957 in the new coniferous forests of the East Anglian breckland.

Detailed observations in broad-leaved woods confirmed that, when a party of tits and their allies sweeps through the trees, its constituent species tend to search different parts of the vegetation (their feeding niches), though all join in when a particular food, for example beech mast, is plentiful. But a quantitative assessment of the amount of food taken by each bird out of the total available is far more difficult to make. Dr. Monica Betts showed that in the Dean the tits took about one-fifth of the wingless adult female winter moths when they were most vulnerable, and this suggested that birds could at least be some check on a pest insect. But it also implied that the species most likely to be useful were the residents which could attack the over-wintering stage of the pest when its numbers were low. (If they are *too* low the birds cannot find them and look for alternative food). So, attractive as large numbers of pied flycatchers, redstarts and warblers may be in the forest, it is probable that they can do little more than mitigate a serious infestation, even when bringing beakfuls of larvae every two or three minutes to their broods.

Many German foresters consider this contribution to be important and Dr. H. Bruns points out that if bird predation on insects prevented a serious infestation, it would be difficult to prove. He quotes some telling examples of reduced populations due to birds

since von Berlepsch claimed that a wood with nest boxes remained green during an insect plague while a control area was defoliated. More recently, on a test area at Neustrelitz, K. Mansfeld found that trees in an area "protected" by two nest boxes per acre had only 50 caterpillars of the moth *Bupalus piniarius* on each tree against an average of 5,000 per tree in adjoining unprotected areas. The Russians are also convinced of the value of birds, even summer visitors, to the extent of transporting hundreds of young pied flycatchers to new forest areas where they claim to have established small populations ; this is especially interesting because, being migrants, the flycatchers might be expected to return to the neighbourhood where they were hatched.

The later work of the Edward Grey Institute team in East Anglia, carried out in close co-operation with the Forestry Commission, involved careful assessments of the amount of food present and the demands made on it by the titmice, mainly coal and blue tits, and by goldcrests in both Scots and Corsican pine plantations. As a result Dr. J. A. Gibb was able to show that in winter these birds sometimes ate a substantial proportion of the available stock of the eucosmid *Enarmonia conicolana*. This encouraged him to suggest that the resident insect-eaters were at least paying their way in these areas and that their numbers might profitably be increased. In summer predation on, for example, *Evetria* species (Pine shoot moth) present in the buds usually amounted to only about 3 per cent. of the stock, but during one particular breeding season coal tits destroyed about a fifth.

The Forestry Commission has now begun its own study at Cannock Chase helped by the West Midland Bird Club ; its object is to see whether different densities of titmice, if they can be persuaded to co-operate by taking to the boxes provided for them, have any effect on the density of the Pine Looper moth *Bupalus piniarius*, as shown by the numbers pupating in the sample areas. If results bear out the claims made by German forest ornithologists, there will be a case for an active

bird encouragement policy in British pine-woods.

None of the finches and titmice which attack conifer seeds do so on a dangerous scale ; the pleasure of having crossbills and crested tits in a pine forest is worth the small levy they extract from the cones. The most serious pests on conifers are the bud-eating capercaillie and black grouse, but while both are controlled in the national forests it is not the Commission's policy to exterminate them ; like deer they are recognised as sporting and

amenity assets. No detailed study of their effect, comparable to the work on the titmice and goldcrest, has yet taken place. The wood-pigeon, which can eat enormous quantities of acorns and beech mast, is being studied by the Pests Division of the Ministry of Agriculture, mainly in relation to its depredations on farm crops, though it also eats weed seeds. But it finds a refuge in conifer stands, especially in small woods and belts, and it is doubtful whether the recommended technique of nest destruction twice a year is practicable in these dense habitats.



Figure 12. Nightingale, *Luscinia megarhynchos*, on an elm branch



Figure 13. Turtle Dove, *Streptopelia turtur*, and young



Figure 14. Hooded Crow, *Corvus corone cornix*, and its young at a nest in an ash tree

Pheasants may not only have sporting value in a forest but help by scratching out pupating larvae of harmful insects from the ground. They are also fond of ants eggs, but as ants are recommended by German foresters for the control of pests, we meet another example of the difficulty of assessing the worth of a species in human terms : the habits of birds were not evolved with man's interests in mind !

But the birds of prey which feed on voles and mice can be regarded without reserve as beneficial to forestry. Again, as with the insect-eaters, it is not certain whether they contribute effectively to the control of large infestations but in more normal years they help to maintain a balance and that is really

the best that any natural predator can be expected to do.

To sum up, birds must on present knowledge be regarded first as an amenity in a forest area, secondly as part of a complex balancing mechanism which good forest practice should try to preserve or recreate even in the age of monoculture, thirdly as occasional pests, to be controlled but not exterminated.

The Future of Birds in the Forest

Both the Forestry Commission and private owners of woodland have an increasing responsibility, in addition to their primary job as timber-producers, for the conservation of wild life. This is because demands for living

space of all kinds from the 50 million human inhabitants of Britain are fast eating up or modifying the rest of the countryside. When our old forests were felled and the chessboard pattern of farmland came into existence over several centuries, most of the woodland species, both of plants and animals, were able to adapt themselves to the copses, gardens and hedgerows, which are really attenuated strips of woodland with maximum "edge".

Almost all the birds which have been described as of woodland origin are to be found in these man-made habitats and thrive there. But modern agricultural practices are against them : hedges are grubbed up to make larger field units ; orchards are regimented

and felled before they can become " good for birds " ; marginal land, with its varied scrub cover, continually retreats before the bulldozer ; and recently the menace of toxic farm chemicals has been added.

The wheel therefore seems to be turning full-circle and only in the forest will many birds find large areas of safe environment. We have seen that a number of hardwood species can live in conifers ; deliberate planting of broad-leaved screens, especially of berry-bearing trees and shrubs, and the leaving of natural bushes, creepers and low cover along the edges of conifer stands will provide suitable habitats for others. For example, the riparian alders by the streams draining the



Figure 15. Heron, *Ardea cinerea*, flying from its nest in the tree tops

forests of the North York Moors at Hamsterley, in Co. Durham, attracted good populations of redstarts, pied flycatchers, titmice and even treecreepers when furnished with nest boxes. Forestry Commission working plans could possibly contain provision for such marginal strips. In total, when we have our five million acres of forest, they would make an impressive national contribution to the conservation of bird life and of many other animals and plants.

The forest itself can be made more attractive in several ways. Recent German research suggests that there is no real limit to the number of nest boxes which can be put up. Even if only half are used for nesting, others make roosts both in winter and for male birds during the breeding season ; it is possible that if they cannot find a separate roost, some males may compete against their own mates and interfere with the nest ! Special types of box are needed for treecreepers, marsh tits, woodpeckers, owls and for birds which prefer an open front, like robins and spotted flycatchers ; particulars are given in the guide published by the British Trust for Ornithology (details at end of leaflet). Some German investigators believe that sawdust-concrete boxes are not only much more durable than wooden ones, but are preferred by the birds because of their better insulation ; they are also safe from attacks by squirrels and great spotted woodpeckers, which can be quite serious predators on young broods.

If shrubs and low cover like brambles can be left, they provide sites for open-nesting birds, while piles of brushings are important for this purpose in conifer stands with their lack of ground vegetation.

Though insectivorous birds may be most useful in winter, there come periods when they cannot get at their natural food and, to survive, they abandon the woodland and seek man's help, directly or indirectly. But this may mean that they do not return for some time after the crisis is over ; the living is too good round houses and farms. Except incidentally, no effort is made to feed small birds

in our forests and it would be well worth setting up some experimental stations, suitably sheltered, and enclosed in wire netting too small to admit predators, and keeping them stocked with food and water. Tits and nut-hatches readily take fats, cheese rind, bread and other scraps, as well as nuts and proprietary mixtures ; long-tailed tits and even goldcrests do occasionally, but it is difficult to help specialists like the treecreeper. It might be possible to attract them to mealworms and ants eggs. Live birds may only be moderately useful to the foresters ; dead birds cannot help him at all.

At present the bird population of our new forests is limited to those native or visiting species which can colonise this rather unpromising habitat of introduced conifers. They are more varied and numerous, as we have seen, than many people realise, but just across the Channel live several other species, adapted to conifers or to mixed woods and sedentary by nature. Ought we to revise our attitude to introductions, which is coloured by unfortunate experiences with several mammals ? The establishment of pheasant and red-legged partridge and the re-introduction of the capercaillie have all been successes ; and the little owl, though it has its opponents, found a vacant niche waiting for it and has settled down to be an acceptable member of our fauna. With our increased knowledge of ecology and of the habits of European birds, it ought to be possible to predict accurately the effect of an introduction. It is hard to believe, for example, that to bring crested tits from Holland to the young forests of East Anglia would result in anything but a charming and perhaps useful addition to their bird life. As they nest naturally in tree holes, nest boxes would have to be provided and the whole population could easily be controlled. Other possible candidates are the great black, middle spotted and grey-headed woodpeckers, which failed to reach us after the last ice age and before the continental land bridge disappeared. The goshawk is probably a "lost" British bird and the best natural check on the

woodpigeon ; its claims are strongest of all. If we are creating a vast new vegetative habitat, it seems only reasonable to people it with an appropriate fauna ; we have already accepted several kinds of deer whose origins are as heterogeneous as those of our introduced conifers.

Acknowledgements and Further Reading

I am indebted to Dr. Monica Betts (Mrs. Turner) for reading through the text and for her valuable suggestions. The only book on

British woodland birds is *Birds and Woods* (Oxford University Press, 35s.) by W. B. Yapp, published in 1962. A field guide on *Nest boxes* can be obtained from the British Trust for Ornithology, Beechgrove, Tring, Herts., price 3s.

The cover picture, and all the black and white pictures, except those noted below, are by John Markham. Eric Palmar took the photos of the hooded crows and the heron, and E. M. Bormann took the view of the buzzards.

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