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THE CRESTED TIT

By Dr. BRUCE CAMPBELL



Figure 1. A Crested Tit in its natural surroundings.

THE CRESTED TIT

INTRODUCTION

The Crested Tit (*Parus cristatus*) belongs to the same genus as most of the British titmice, a group containing between thirty and forty species which occur in most parts of Europe, North Africa, Asia and Northern and Central America. D. W. Snow has summarised them neatly as "small, agile, hole-nesting birds with short beaks, which exploit the branches, twigs and leaves of trees for feeding".

In Britain, a special Scottish race of Crested Tit, with a very local distribution in the coniferous woodland of the east central Highlands, has been distinguished. Very few vagrants from the Continent of Europe, where

other races are widespread, have been satisfactorily identified in England, and none have been found in Wales or Ireland.

DESCRIPTION AND FIELD CHARACTERS

Although it has the rather plump figure, rounded head and stubby bill of the typical titmice, the Crested Tit is easily distinguished from all other European species, under reasonable conditions of observation, by the crest which gives it its name and which is normally carried erect like that of a miniature cockatoo (see photographs).

The upper parts are dull brown, the wings



Figure 2. The old Caledonian pinewoods around Loch Morlich in the Glenmore Forest Park, Strathspey; a well-known haunt of the Crested Tit.

and tail being darker than the back and rump. The feathers of the crest are dull white with black centres, and the face is also off-white with a narrow curving black stripe, extending from the black bib round to the nape, to give a collar effect; another thin black stripe passes through the eye and turns sharply at the nape.

The underparts are dull white with a buff suffusion on the flanks. The legs are greenish-grey; the short, straight bill is black; the eye is a bright brown. The length from bill to tip of tail is about $4\frac{1}{2}$ inches (11.5 cm).

Adult males and females cannot be told apart as seen in the field, though in fact the female's crest feathers are shorter. Juveniles have definitely shorter, darker crests, and the black on the face is duller and less extensive, but by their first winter they cannot be told from adults. The Scottish race is darker on the back than the northern and central European races. (See under Classification on page 12.)

The only British bird with which the Crested Tit can really be confused is a Blue Tit (*Parus caeruleus*) in a poor light. The facial patterns are somewhat similar and the Blue Tit has a habit of erecting the feathers at the back of its crown to give a crested effect. It is probable that some supposed sight records of "crested" tits in southern Scotland and England were Blue Tits.

Crested Tits, like their relatives, are active, quick-moving little birds and are described by several writers as feeding a good deal on the trunks of trees, though this was not D. W. Snow's impression when carrying out observations in Sweden. They also feed on the ground where they hop.

They sometimes make flights of several hundred yards, undulating with rapid opening and closing of the wings. More usually their flights are simply short flips from tree to tree.

Crested Tits are by no means easy to see in their usual habitats and are best identified by their purring trill, which Stuart Smith vocalises as "pturr-ree-ree-ree". It is unlike any other note uttered by a British bird and once learned is easily recognised. A thin "zee-zee-zee" call is also used, but may be confused

with similar calls by other titmice.

B. W. Tucker in *The Handbook of British Birds* describes the song as a loud repeated version of the trill, but Stuart Smith renders it "zee-zee-zee-cheera", approaching the song of the Blue Tit. A "high-pitched double note", which may be an alternative song, was recorded by F. B. Kirkman.

Crested Tits are resident and may be located throughout the year in the same restricted area. This has been confirmed by ringing data from Culbin Forest, where Andrew Deadman found them almost always in pairs during the winter, sometimes in small groups of four or five birds, but very rarely alone. It is quite possible therefore, that the birds pair for life, although some writers refer to family parties wandering about after the breeding season and joining mixed flocks of other titmice, treecreepers (*Certhia familiaris*) and goldcrests (*Regulus regulus*). Nothing seems to be published about roosting habits in Scotland, but crested tits no doubt occupy holes and crevices like their relatives.

HABITAT

Although the Crested Tit is typically a bird of the conifer forests, with a strong preference for spruce and pine in Northern Europe and Russia, further south it is found in mixed woods as well; in the Pyrenees it occurs in beech and in southern Spain in cork oak (*Quercus suber*), though in both regions it also haunts conifer forest (Snow, 1954b). Fuchs (1965) notes an exceptional case of a pair nesting in a Swiss village and foraging only in deciduous vegetation.

The Scottish race is confined to pine forest, which often contains birch and alder, particularly when it is very old and open, as in the traditional "Caledonian pine" areas of Strathspey. In recent years Crested Tits have penetrated low-lying plantations as well, and limitation of their range in Scotland seems partly due to lack of nest-sites in otherwise suitable woods; so far nest-boxes have not provided a solution. D. Nethersole-Thompson, whose extensive field studies of the Crested Tit

are quoted by Darling and Boyd (1964), gives the present altitudinal range as from sea level near the mouth of the Findhorn to between 1,500 and 1,600 feet (about 500 metres) in the upper Spey Valley; the European height range is from about 100 to 1,000 metres.

DISPLAY AND MATING

The display of the Scottish Crested Tit has been described by D. Nethersole-Thompson (in *The Handbook of British Birds*) and by Stuart Smith. The male flies round the trees repeating the purring trill and when he has found a female, chases her through the branches. If she settles, he flutters round her trilling, his crest fully raised, and the female responds with a low-pitched version of the trill.

Feeding of the female by the male continues right through the breeding cycle, the female "quivering" or "shivering" her wings and crouching on a branch. This position is presumably also adopted before mating. During incubation, feeding by the male becomes necessary for the closely-sitting female, and this process shows how a form of display can merge into behaviour with a direct function, from which the display may originally have been derived.

THE BREEDING CYCLE

Few British observers have watched the early stages of the breeding cycle and none have published their observations. But Miss Ross (1933) gives 4th April, 1933 as the date of a "half-made nest" wherein eggs were subsequently laid; she suggests that the nest-site may be chosen well before the end of March. More usually, excavation of the nest-site takes place in mid-April, eggs are laid by the end of the month or early in May, and the young fledge early in June.

S. Durango gives the date of the first egg laid in 111 Swedish nests. Two were laid in the first ten days of April, but 37 in the last ten days of that month. Forty-two first eggs were laid in the first ten and 21 in the second

ten days of May; while only one clutch was begun in June. Nethersole-Thompson has recorded first clutches "as early as 8th April and at least as late as 12th May".

Crested Tits commonly build their nests in holes made in tree branches, and the excavation of the hole and the actual nest building were first described in detail for the Scottish race by Miss Ross in 1934. The observers made a little opening in a rotten stump three feet above ground and a pair of tits soon took it over. Excavation took five days and was done entirely by the female bird, although the male was always near the nest-hole and even went inside. He often fed the working female with insects. The most continuous work was done in the mornings and again between 5 and 7 p.m.; in the afternoon the female worked for short spells at the hole, alternating with long absences. Each time the bird left the hole she carried off a chip and dropped it about three yards away. The noise of chipping in the later stages could be heard 25 yards off, but it was noticed with this hole and others that have been examined that the tits cannot tackle solid wood. This means that the cavities are irregular in size and shape, the bird following the line of least resistance; nor does it make the neat woodpecker-like entrance hole characteristic of our other hole-excavating titmouse, the Willow Tit (*Parus montanus*).

Nest building in this particular case took six days. The foundation was moss, and the lining sheep's wool, with some white down and feathers. Deer hair and hare's fur are other common materials; no doubt the birds take whatever is suitable and near at hand. The male rarely takes part in building (Stuart Smith watched it once in a late nest) although he follows the female to and fro on her journeys.

In the nest watched by Miss Ross there was a day's "rest" before egg-laying began. Eggs are normally laid daily until the clutch is complete, and are covered during the laying period by material specially brought in for the purpose. Gordon gives an example of delay

in the completion of the clutch due to bad weather.

The clutch is rather small for a titmouse, averaging 5 or 6 eggs, sometimes 7, while the early nest observed by Miss Ross in 1933 had 8 eggs. 115 Swedish clutches recorded by Durango were grouped as follows: 3 eggs, 6; 4 eggs, 23; 5 eggs, 66; 6 eggs, 15; 7 eggs, 1; and one nest with 9 eggs, probably produced by two birds. An average of 182 Swedish clutches quoted by Lack from Durango's data is 4.92 eggs. But the average of 1,143 Dutch clutches was 7.07 eggs. Glutz von Blotzheim (1962) gives an average of 5.86 for 22 Swiss clutches; while in south-west Germany Löhrl's (1966) average was 6.3 for 29 clutches, the most usual clutch being 6 eggs; a clutch of 9 is occasionally recorded. His fledging success was 153 young from 171 eggs, two broods out of three suffering no loss at all. There is no evidence of genuine second broods either from Switzerland or south-west Germany.

The eggs are of the usual tit type, white with dark red spots which form a zone round the broad end. This zonation makes them even more attractive to egg collectors, who seek them primarily on account of their rarity. Only the female bird sits on the eggs, and incubation lasts from 13 to 15 days, normally beginning when the clutch is complete. The male feeds her on the nest but she also makes feeding forays on her own. Miss Ross saw one bird return to the nest with a large moth after she had been sitting for six days.

The eggs hatch over a period of hours, and it is likely that at first the male brings food which is passed on to the brood by the female. Stuart Smith, observing one pair of birds, found that both parents brought food in about equal proportion, always arriving together at the nest-hole; one would then wait while the other delivered its load. They flattened their crests as they went in and out of the hole (see Figure 5). According to Nethersole-Thompson (1971) "almost every pair has a slightly different brooding rhythm".

When the young are very small, the female

broods them for spells of about forty minutes alternating with "about a dozen" feeding visits, according to H. A. Gilbert and Arthur Brook; these observers did not see the male bring food at all. The female alone cleans the nest, carrying away faecal sacs after her visits with food.

The nestling period lasts from 16 to 20 days, with 18 as the average—about the length that has been found usual with the other titmice.

Crested Tits will nest again if the first clutch is lost, but there is only one record of a true second brood (i.e. after a successful fledging of the first brood of nestlings) in Scotland. Durango could only claim one certain and eight other possible second broods out of 167 Swedish records.

Nethersole-Thompson has noted 341 Scottish nest-sites, of which 246 were in pine stumps, sometimes in quite open areas. 45 were in dead and 8 in living pines; 7 in birch and 6 in alder stumps; 5 in strainer posts; 4 each in dead alders and dead birches; 4 in holes made by Great Spotted Woodpeckers; two in nest-boxes, one in a gate-post and one in a squirrel's drey 15 to 20 feet up a pine. Stuart Smith's 49 sites may include some of Thompson's: 31 are in pines. Miss Ross describes 22 sites, including one in a rotten tree-root and one in a typical tree-creeper situation between bark and trunk. Other odd sites listed in *The Handbook of British Birds* are in the nest of a Hooded Crow (*Corvus corone cornix*) and in hollow metal fence posts, which are quite often used by other species of titmice. Records from Esthonia include sites in the bottoms of old Hooded Crow and Kite (*Milvus* sp.) nests.

W. G. Milne first observed Crested Tits in the Culbin pinewoods of the Laigh of Moray Forest on the sandhills near Forres in 1948, and found his first nest there in 1953, in a dead pine. He says the cavity is usually excavated between the bark and the wood, but the nest is occasionally built in an old woodpecker boring in a dead birch; he has only once seen a nest-box used.

The height range of nests varies from ground

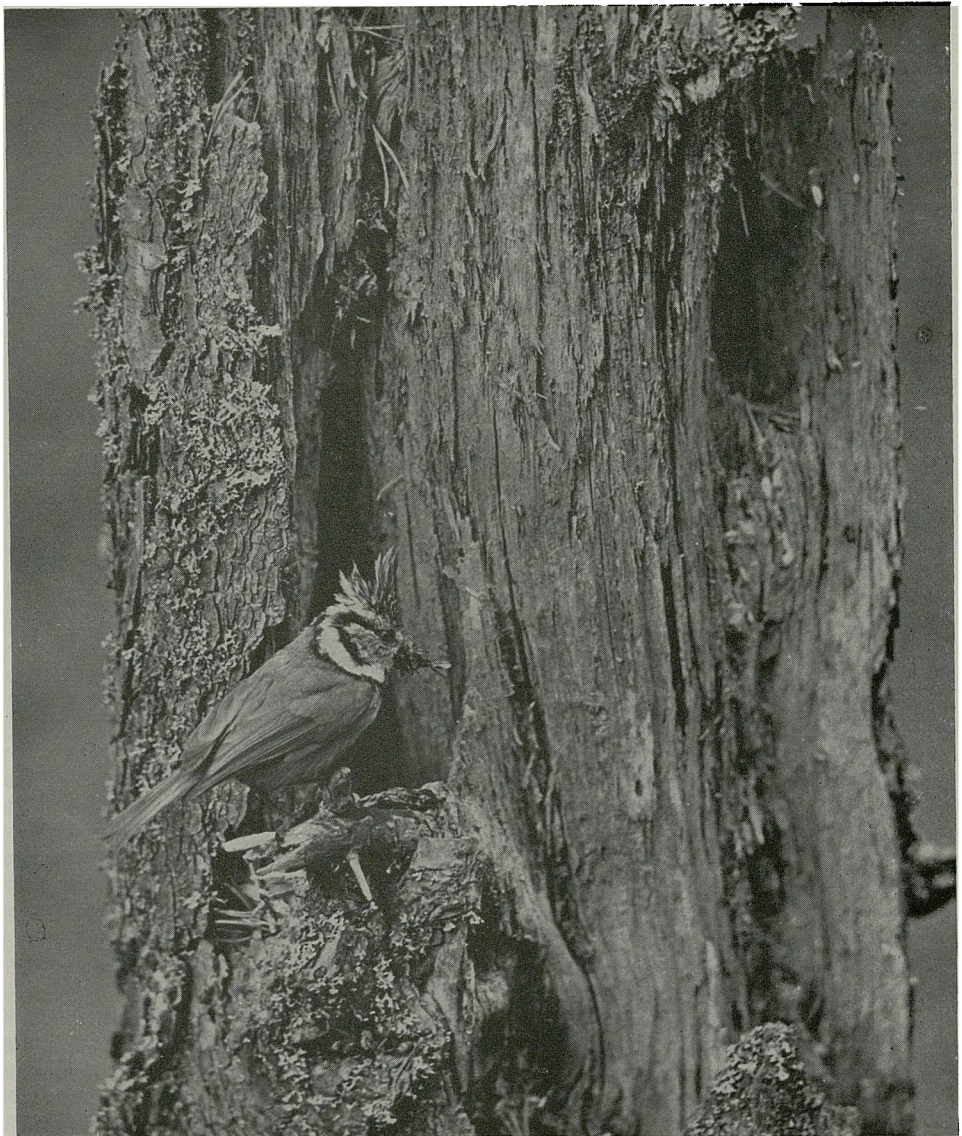


Figure 3. Crested Tit approaching its nest hole; note the decayed character of the tree chosen for breeding.

level to 45 feet, but the majority are below 10 feet. Stuart Smith remarks that the same hole is never used twice, though the same tree may be bored in a new place.

The Swedish nest-sites described by Durango show a preference for deciduous trees; 61 out of 76. Most are in stems or stumps, in excavated holes or nest-boxes, and the average height is about 8 feet.

Dr. H. N. Kluijver has told the author that to attract Crested Tits nest-boxes should be made of old timber, looking as natural as possible. He had considerable success for some years in the Dutch pine forests, and when working near Boston, U.S.A., Kluijver filled nest-boxes with sawdust and shavings; this allowed the Black-capped Chickadee (*Parus atricapillus*), another excavating species of tit, to work off its instinctive drive by clearing out the material before nesting. This trick would be worth trying in Crested Tit areas.

Miss Ross remarks on the aggressiveness of the pair of Crested Tits she watched in 1934 towards other birds. When the tits were building, Willow Warblers (*Phylloscopus trochilus*), Blue and Great Tits (*Parus major*) were attacked, and a Goldcrest was chased by the female when they were both searching for moss. But a singing male Chaffinch (*Fringilla coelebs*) was only occasionally attacked and a female Bullfinch (*Pyrrhula pyrrhula*) was ignored.

FOOD AND FEEDING HABITS

From the forester's point of view the feeding habits of a woodland bird are the most important part of its ecology. Unfortunately no detailed study of the food and feeding of the Scottish Crested Tit has been published.

The Handbook of British Birds seems to regard it as mainly insectivorous, but this may be based on what the adults bring to the young, since this is the only period of the annual cycle which has been watched closely in Scotland. Ripe pine seeds and juniper berries are also taken, and Gordon notes that in winter Crested Tits are attracted to the fat

exposed in the grallochs of Red Deer (*Cervus elephas*) hinds, and will even peck at deer-skins nailed up to dry. J. P. Grant has had them feeding off his sandwiches when he was out deer-stalking: they become very tame in cold weather.

The young are certainly fed on insects and spiders. Stuart Smith has photographed adults bringing earwigs, hover-flies, caterpillars and adult moths in their bills; the moths usually had their wings removed. Small spiders were also brought.

D. W. Snow (1949) watched the feeding behaviour of seven species of tits in coniferous forest near Uppsala in Sweden in July-August, 1948. He noted that Crested Tits fed at all heights, showing no preference for spruce or pine, nor did they show a height preference except in flocks dominated by Great Tits, when they tended to keep low. On both pine and spruce they fed mainly on twigs and needles. The food taken was not studied.

Inozemtsev's Russian study suggests that the Crested Tit is important in the forest because it remains in the conifer habitat throughout the winter, concentrating its feeding among the small twigs and needles. He gives details of its prey, both insects (from the orders *Homoptera*, *Heteroptera*, *Coleoptera*, especially weevils, *Hymenoptera*, *Lepidoptera* and *Diptera*) and spiders; and he shows how the average feeding height varies from month to month.

It is usually above 6 metres (about 20 feet) except in April and November, and at its highest in July. He also studied the breeding cycle with particular reference to the food brought to the young, and gives tables for their growth-rate both before and after fledging.

The previous most thorough study of the food and feeding habits of the Crested Tit was made in Norway by S. Haftorn in 1949, 1950 and 1952. He found that the proportion of foods taken in late summer varied considerably from year to year; in 1949 the proportion of animal to vegetable material was 77:23; in 1950 it was 67:33; but in 1952 it was 97:3 in the same area. The birds fed mainly in spruce

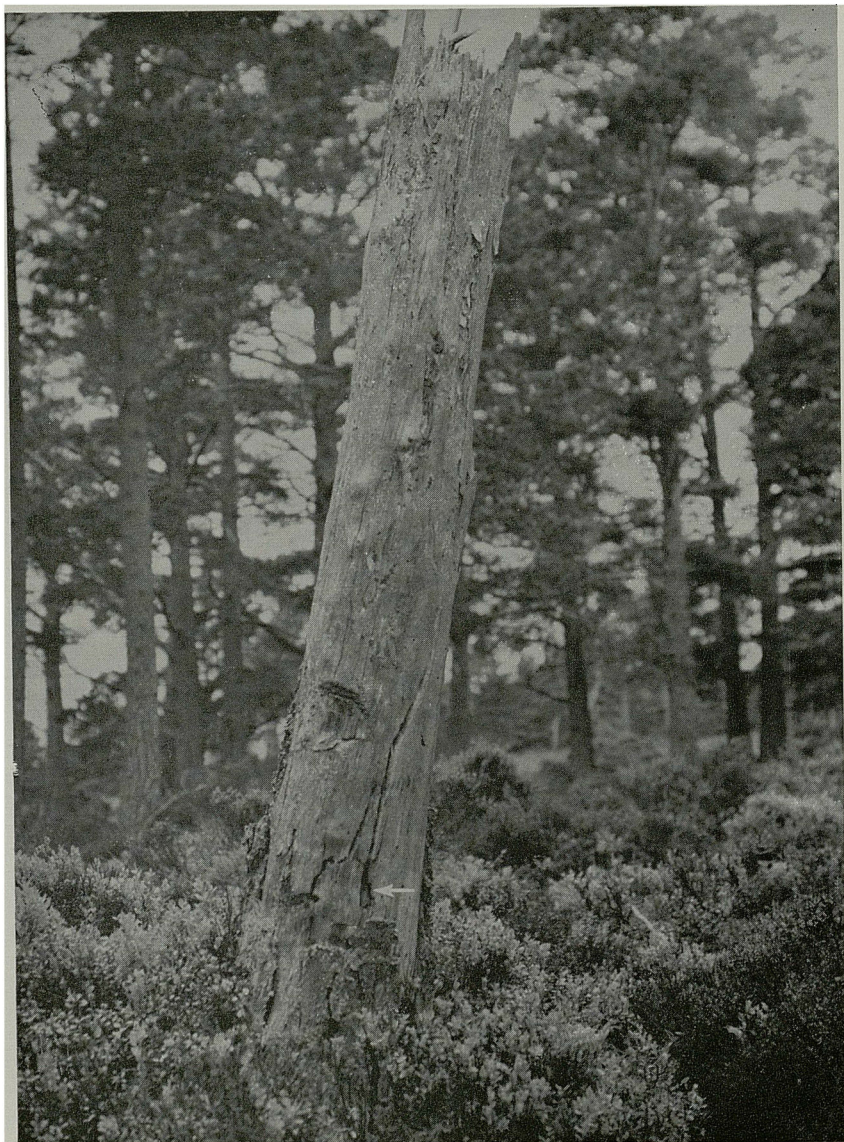


Figure 4. Nesting site of a Crested Tit in Rothiemurchus Forest, Strathspey; the arrow shows the site of the nest hole.

and pine trees and on the ground; in 1952 they fed almost entirely in the conifers.

In summer the tits take mainly animal food; in autumn and winter there is an admixture of vegetable: chiefly seeds of pine and spruce. These are taken directly from the ripe cones, or from cones attacked by squirrels or lying on the ground, but—especially in mid-winter—they may be seeds stored in the previous autumn.

The habit of storing food is now known in several species of titmice, chiefly those associated in Europe with conifers: Coal Tit (*Parus ater*), Willow Tit, Crested Tit and Lapp Tit (*Parus cinctus*). But the Marsh Tit (*Parus palustris*), generally typical of deciduous areas, also stores and has been observed to do so in England, whereas the Great Tit and Blue Tit rarely store food.

Crested Tits observed by Haftorn stored mostly pine and spruce seed, but also some insects and spiders, especially the cocoons of Sawflies (*Tenthredinidae*), the larvae of butterflies and moths (*Lepidoptera*), and those of two-winged flies (*Diptera*) and aphids. Storing was observed at all seasons except mid-winter, but it was concentrated in autumn. The objects were stored individually on branches of spruce and pine, usually in contact with lichen, in crevices of bark, or even between the needles. They were usually wedged in place, but sometimes the bird's saliva or the fluid of the insect prey itself were used to help to hold them.

The objects were generally protected from above and visible from below so that they could be seen in snow; occasionally they were completely hidden.

Haftorn believes that in some seasons Crested Tits in Norway depend largely on stored food, but he does not think they necessarily remember where they have hidden each item; items may be found by other tits searching the trees, though it seems likely that an individual bird would tend to look in the sort of places in which it had itself hidden food.

It would be very interesting to know whether the storing habit occurs in the Scottish Crested

Tit, a population which has been for so long cut off from its relatives.

DISTRIBUTION IN BRITAIN

The Crested Tit was first mentioned as a British bird in 1789, and William Macgillivray localised it to the Spey Valley in 1836. Harvie-Brown and Buckley, in 1895, defined the traditional area as "an extent of country about 30 miles in length and varying in width from three to ten miles", roughly from Aviemore in Inverness-shire down the Spey almost to Ballindalloch in Banffshire, and mainly on the south-east side of the river in the old Scots pine tracts below the Cairngorms and up to 900 feet above the sea.

Since then there has been evidence of spreading, first right down the Spey to Fochabers, where a single bird was seen in 1868 or 1869 but breeding was not proved until 1899. In 1910 Crested Tits were found by William Berry at a locality in lowland wooded country down the Findhorn valley, and during the next eight years they were seen in several places between the north-east corner of Nairnshire and Forres. By 1927 they were reported by Dr. W. Eagle Clarke to be breeding in Banffshire almost to the border of Aberdeenshire and by 1939 they had reached the Forest of Mar, right up the Dee. J. P. Grant saw Crested Tits in very tall spruces at the Linn of Dee in the autumn of 1950. It seems more likely that they had come up the river valley than directly over the Lairig Ghru from Speyside. In 1946 P. J. Sellar reported at least one at Knock in Banffshire about 25 miles from the traditional area.

There are very old records for Argyll, Dunbarton and Midlothian given by Gray; more recently two for Perthshire, one for Angus and even one for Lanarkshire, but with no indication of the race involved.

Northward from the main area, Crested Tits were found in east Ross-shire in 1901-12, and certainly bred there because juveniles were seen. They are now reported to be breeding in an old pine wood within two miles of the Sutherland march and at least three



Figure 5. Crested Tit emerging from its nest hole; note how the crest has been depressed.

birds have been seen across it, one as far as Golspie. Much more remarkable is the isolated record of two seen in 90-year-old pines at Dundonnell in west Ross-shire by F. Fraser Darling in June, 1934, a date which suggests breeding.

The most controversial "spread" is that to Glengarry and Loch Arkaigside in west Inverness-shire, where Crested Tits were supposed to be nesting between 1890 and 1920 on the testimony of a gamekeeper who lived all his life in the region. No ornithologist was able to confirm their presence, but in 1943 Darling saw one near Fort Augustus, in 1945 A. H. Johnson reported two in Glengarry, and in 1968 Douglas Weir saw one on a fence-post "between Loch Arkaig and Glengarry" (Nethersole-Thompson, 1971).

The Crested Tit is known to be a remarkably sedentary species and it is difficult to assess these odd records. But it seems at least possible that one or two birds might attach themselves to a flock of other species and wander out of their usual haunts. Once disorientated, a sedentary bird has probably less chance of finding its way back than a mobile one, and it might therefore travel a considerable distance in the wrong direction. If there were two birds together and they landed in a suitable habitat, for example that at Dundonnell noted above, then breeding might follow.

Genuine spread cannot very well take place unless the proper habitat conditions are present and, for the Scottish race, these appear to be seed-bearing pine woods with plenty of nest-sites. At first sight it would appear unlikely that the "new" forests would attract Crested Tits, unless nest-boxes were provided to replace the natural holes and rotten trees in which they prefer to nest. Under intensive forest management, the aim is to remove trees before they have become unsound; and although Crested Tits will take to holes in broadleaved trees round about, they have to compete for them with other kinds of birds that are already established. Nevertheless, Crested Tits are now successfully established

at Monaughty in the Laigh of Moray Forest, near Elgin; planting here began in 1920, and the tits were first observed about 1940, when the oldest plantations were twenty years old. Again much of their spread in Denmark has been through new forests formed on the Jutland heaths.

Nethersole-Thompson estimates that in the years between the wars there might be 120-125 pairs of Crested Tits in just over 200 square miles of deer forest country east of the rivers Feshie and Spey; on 3,400 acres of old pines there were in some seasons 11 to 15 pairs per 1,000 acres. Dr. Myles Crooke estimates that the density in parts of the sheltered Culbin pinewoods may be as high as one pair to 50 acres. Thompson believes the Scottish population may rise to between 300 and 400 pairs. But it also crashes, and the Crested Tit was among the species reported as reduced by the cold spell of early 1947 when J. P. Grant considered that a half to two-thirds of the *Rothiemurchus* birds died. The numbers recovered quickly to more or less normal levels in 1949, to suffer again in 1951. In 1963 the bad weather followed a different pattern and, while numbers were down, Grant believes the mortality was less than in 1947. By May and June he was surprised at the numbers to be seen, and the mild winter of 1963-64 helped them considerably; he always marvels at "the remarkable capacity of the species to recover from near-disastrous conditions in such a comparatively short time". There are no reports of any major expansion of range in the past six or seven years.

The few English records of Crested Tits up to 1938 are given in *The Handbook of British Birds*. One specimen of the northern race was obtained at Whitby, Yorkshire, in 1872. Four others are recorded, all before 1873, and there are five sight records of undetermined race. One specimen of the central European race was recorded in the Isle of Wight before 1844. Since 1938 few further records have appeared. One was of a single bird seen by T. R. F. and N. V. A. Nonweiler on 28th December, 1947 in the gorse bushes near Dawlish, South



Figure 6. A Crested Tit at the entrance to its nesting-hole.

Devon, which seems a remarkable habitat. Another sight record was by Miss D. Burridge at Godstone, Surrey, on 10th April, 1945.

CRESTED TITS AND FORESTRY

The absence of any detailed food study or of a published account from neighbouring parts of Europe makes it hard to judge whether or not Crested Tits are of any economic importance in British forests. In winters much milder than those of Scandinavia it seems unlikely that much food-storing takes place or that any significant amount of pine seed is taken. On the other hand, it is just possible from British work on other titmice feeding in conifers that a large population might have some controlling effect on insect life.

CLASSIFICATION AND EUROPEAN DISTRIBUTION

The Crested Tit is a purely European species, though it reaches the borders of Asia at the Ural Mountains. A closely related crested

species, *Parus dichrous*, is found in the Himalayas and neighbouring ranges (Snow 1954b), while the New World boasts the very similar *Parus wollweberi*, which is a bird of broad-leaved forest.

The Crested Tit is absent from most of Britain, from Italy and its islands, parts of the Balkans and the extreme north of Scandinavia. Four races are mentioned in *The Handbook of British Birds: Parus cristatus scoticus* (Prazak), with which this leaflet has mainly been concerned; *Parus cristatus cristatus* Linnaeus, the northern race and first to be described, found in Scandinavian countries, East Prussia, Poland, the Baltic States, Russia and the Balkans; *Parus cristatus mitratus* Brehm, found in all the countries of central Europe from France to Roumania; and *Parus cristatus weigoldi* in the Iberian peninsula. Various other races have been described by European authorities, but D. W. Snow (1954a) considers the position is best represented by a "cline" or colour gradient from the deepest foxy-

brown population in Brittany (called *Parus cristatus abadiei* by H. Jouard) to the palest grey-brown birds, the typical *cristatus*, in Scandinavia and the Balkans. The relationship between the measurements and plumage differences of the sub-species has been the subject of a statistical study by Sturgen and Kohl (1964).

The most interesting comparatively recent change of status has been the spread of central European Crested Tits into Denmark as recorded by Jespersen, due to the conifer afforestation of large areas of Jutland.

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The photograph on the cover is by Dennis A. Avon, those on pages 8 and 10 are by Dr. Stuart Smith, that on page 2 is by R. M. Adam, that on page 6 by Eric J. Hosking, those on page 12 and on the back cover by Sid Roberts (Ardea).

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Figure 7. Crested Tit at nest with young.

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