

Habitat preferences and prey of Merlins in winter



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Sexual dimorphism in size of adult Merlins *Falco columbarius* is marked, the blue-mantled males weighing about 24-30% less than the brown females (Cramp & Simmons 1980; Dr C. J. Bibby *in litt.*). First-years of both sexes are brown, like adult females. Although males are smaller, there is little published information on any habitat preferences of 'blue'

continued...

and 'brown' Merlins in winter. This paper summarises observations on habitat and prey choice of Merlins wintering in West Galloway, Scotland, during 1965-84. The results are, of course, difficult to interpret, since a split into blue and brown individuals separates them neither by age nor by sex.

Methods

The Merlin's small size and low, fast flight make it notoriously elusive in winter. Nevertheless, between 1965 and 1984, I recorded all Merlins seen from September to March and noted their plumage and habitat, hunting methods and choice of prey where this was possible. In February 1970, a small communal roost was found which held up to five Merlins (Dickson 1973); direct observation indicated that the Merlins hunted over the surrounding countryside, using this roost as a base. No sightings are included of Merlins obviously on their way directly to or from the roost.

Table 1. Numbers of 'blue' and 'brown' Merlins *Falco columbarius* seen in winter in different habitats in West Galloway, 1965-84

χ^2 non-significant (2.31; 3df)

Area	Habitat	Blue (%)	Brown (%)	Totals
Upland	Rolling moorland and sheepwalk	8 (13.3%)	29 (10.9%)	37
Lowland: farmland	Low-lying pastureland, cultivation	25 (41.6%)	91 (34.3%)	116
Lowland: 'marginal'	Rough pasture, rushy areas	16 (26.6%)	100 (37.7%)	116
Coast	Merse, cliffs, estuaries	10 (16.6%)	43 (16.2%)	53
Other	Rail lines, conifer forest, urban	1 (1.6%)	2 (0.8%)	3
TOTALS		60	265	325

Results

Habitat preferences

Table 1 shows 325 diurnal sightings of Merlins according to habitat and plumage characteristics. The majority of sightings of both plumage classes were in farmland and 'marginal' areas, with fewer in coastal or upland localities. It would seem that blue and brown Merlins are distributed equally across all habitats and do not differ in their habitat choice in winter (table 2).

Hunting methods

Merlins employ a wide variety of hunting techniques, facilitating the

Table 2. Seasonal changes (Sept-Mar) in preferred habitats of 'blue' and 'brown' Merlins *Falco columbarius* in winter in West Galloway, 1965-84

Area	Habitat	NO. OF SIGHTINGS						Totals
		Sept-Nov		Dec-Jan		Feb-Mar		
		Blue	Brown	Blue	Brown	Blue	Brown	
Upland	Sheepwalk/moorland	3	13	0	9	5	7	37
Lowland	Farmland/cultivation	6	50	10	23	8	19	116
Lowland	'Marginal'	6	34	6	33	4	33	116
Coast	Merse/cliffs/estuaries	4	29	2	7	4	7	53
Other	Rail lines/forest/urban	0	1	1	0	0	1	3
TOTAL SIGHTINGS		19	127	19	72	21	67	325

exploitation of a wide range of prey species. In this study, the most characteristic methods included: fast, low-level, direct flight less than 1 m above the ground; 'still-hunting' from various perches (see below); and searching from high above the ground (table 3). Prolonged chases were seldom recorded. If the initial attack failed, the Merlin would sometimes fly away or land on a perch, but at other times it doggedly pursued prey, twisting and turning, and swooping at it ('tail-chasing'). Some intended victims escaped by rejoining a flock or diving into cover, but on three occasions Merlins were seen crash-diving into hedges after prey, once successfully. Four observed hunts involved two Merlins. On some occasions, hunts combined two or all three methods.

In California, Page & Whitacre (1975) recorded 343 attacks by a female Merlin, of which 278 (81%) were directed at quarry initially on the ground. Rudebeck (1951) also recorded this method, although, in Hampshire, Ash (1960) never saw Merlins attempt to kill on the ground. In the present study, Merlins were seen to 'pounce' to the ground five times, once capturing a Starling *Sturnus vulgaris* and once clutching unsuccessfully at a Redshank *Tringa totanus*; they have also been seen apparently stalking prey on the ground (Dickson 1979).

Merlins landed on and hunted from various perches, including fence posts, bushes or trees, telegraph and electricity poles, straw bales, dykes, grass/heather tufts, and on the ground. The length of time perched varied from a few seconds to 62 minutes (mean 8.5 minutes).

Table 3. Observation frequency of hunting methods of Merlins *Falco columbarius* (all classes) in winter in West Galloway, 1965-84
See text for description of methods

Hunting method	No. of observations	(%)
Low flight	116	(49%)
'Still hunting'	77	(32%)
From height	44	(19%)

Choice of prey

When Merlins were seen hunting avian prey, the species was identified and scored accordingly (table 4). All such birds recorded were species usually associated with low ground and open country in winter. Skylark *Alauda arvensis* was the species most often attacked, followed by Starling, finches (Fringillidae) and Meadow Pipit *Anthus pratensis*. A significant association of prey size with each Merlin class (blue or brown) could be inferred: blue Merlins tried to take large birds on only two out of 19 attempts, while brown Merlins showed a far less obvious bias in size selection. This probably indicates a considerable difference by sex, although the alternative explanation that adult males take smaller prey than do first-years can only be dismissed as being less likely rather than disproved.

Interspecific relations

Marked aggression towards other bird species was shown by both sexes of

Table 4. Percentage frequency of avian prey species in observed hunts by 'blue' and 'brown' Merlins *Falco columbarius* in winter in West Galloway, 1965-84

Prey species	No. attacks		No. attacks		SUCCESSFUL		
	by blue Merlins	% frequency	by brown Merlins	% frequency	blue	brown	blue+brown
Waders ¹	—	—	10	10.5	—	2	—
Thrushes ²	1	5.3	3	3.2	1	1	—
Starling <i>Sturnus vulgaris</i>	1	5.3	17	17.9	—	4	—
Skylark <i>Alauda arvensis</i>	4	21.0	20	21.0	—	—	2
Finches ³	6	31.6	11	11.6	—	—	1
Meadow Pipit <i>Anthus pratensis</i>	1	5.3	11	11.6	—	2	1
Others ⁴	2	10.5	7	7.4	—	1	—
Unidentified small passerines	4	21.0	16	16.8	1	—	2
TOTALS	19		95		2	10	6

1. Includes Turnstone *Arearia interpres*, Dunlin *Calidris alpina*, Ringed Plover *Charadrius hiaticula*, Lapwing *Vanellus vanellus* and Redshank *Tringa totanus*

2. Includes Redwing *Turdus iliacus* and Blackbird *T. merula*

3. Includes Greenfinch *Carduelis chloris*, Redpoll *C. flammea*, Linnet *C. cannabina* and Twite *C. flavirostris*

4. Includes Pied Wagtail *Motacilla alba*, Reed Bunting *Emberiza schoeniclus* and House Sparrow *Passer domesticus*

Merlins on restricted home ranges in southern England, where Magpies *Pica pica*, Carrion Crows *Corvus corone* and Short-eared Owls *Asio flammeus* were attacked (Cramp & Simmons 1980). In Galloway, seven other predators hunted in the study area, but most aerial conflicts observed were between Merlins and Carrion Crows or Hen Harriers *Circus cyaneus*. Hen Harriers also wintered in the area, using the same roosting area and feeding to a large extent on small birds (Watson & Dickson 1972; Watson 1977; personal observations), and sometimes hunting regularly over the same ground as Merlins. These two species may, therefore, compete for the same prey species, but this was not determined. On eight occasions, however, Merlins were seen in attendance on hunting Hen Harriers (Dickson 1984); Watson (1977) and Cudworth & Massingham (1986) suggested that such an association could be mutually advantageous in locating prey.

Discussion

Since an equal amount of observation time was spent in all habitats, the differences in preferred habitat (table 2) are probably real. The roost was located in low-lying ground adjacent to the coast, but Merlins leaving the roost normally flew inland and only infrequently to the coast. It is generally stated that Merlins winter in coastal habitats, but this probably reflects observer coverage and the fact that Merlins are relatively more conspicuous in this habitat. There were also fewer sightings of Merlins in moorland habitats, where some of their prey species remain in winter. Merlins would, however, have to feed not only better on moorland, but better by a difference of at least the energy equivalent of the round flight

to and from their roost; otherwise it would be more efficient for them to remain on low ground where prey species are plentiful.

More study is needed of the winter prey of Merlins, but the small sample of observations of birds attacked suggests that the winter diet of Merlins corresponds largely with that in summer. Published results from breeding-season studies show that Merlins take a wide variety of avian prey: in Northumberland, 82% consisted of species weighing less than 50 g and 67% of species weighing less than 30 g (Newton *et al.* 1978). From further study in Northumbria, Skylarks figured prominently as prey in the breeding season (Newton *et al.* 1984), as they did in Galloway (Watson 1979; personal observations), but they did not feature largely as winter prey (although they were the species most commonly attacked). The heaviest winter prey in Galloway was an adult Lapwing *Vanellus vanellus* (about 190 g) taken by a brown Merlin, which compares with the heaviest breeding-season prey in Northumbria, which were grouse *Lagopus*, pigeons *Columba*, Lapwing and Golden Plover *Pluvialis apricaria* (up to 300 g). The heaviest winter prey taken by a blue Merlin in Galloway was a male Blackbird *Turdus merula* (about 100 g), which compares with Fieldfare *T. pilaris* (100-120 g) from the Northumbria breeding study.

In conclusion, male and female Merlins would appear to take prey of different sizes in winter (as they do also in summer: Newton *et al.* 1984), but they do not segregate by gross habitat as a result. This is perhaps not surprising, as small birds such as finches may congregate on coasts and large species such as thrushes and Starlings are common enough to replace waders as potential prey for inland females. This study demonstrates that both blue and brown Merlins winter on farmland and 'marginal' areas, rather than in upland or coastal habitats.

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Summary

All Merlins *Falco columbarius* seen in West Galloway in winter during 1965-84 were classed as 'blue' (adult male) or 'brown' (adult female or first-year). The two types were distributed equally across all habitats. Observations suggested that blue and brown Merlins take prey of different sizes in winter. Many Merlins wintered in lowland habitats, particularly farmland and 'marginal' areas, where they fed largely on small birds.

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