Ringing & Migration

VOLUME 19
1998 and 1999

Editor
Mike Hounsome

Editorial Panel
Franz Bairlein, Peter Ferns, Stephen Norman, David Norman and Roger Riddington

Supplement
Proceedings of the JNCC/BTO Workshop on the Conservation Uses of Ringing Data,
4-5 November 1995, Norwich.

Editors
Stephen Baillie, Chris Wernham and Jacque Clark

ISSN 0307-8698
## Ringing & Migration

Contents of Volume 19, 1998 and 1999

### Part 1 (May 1998)

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill colour as an ageing technique in the Hooded Crow Corvus corone cornix: a cautionary note. P.D. O'Donoghue, T.F. Cross and J. O'Halloran</td>
<td>1</td>
</tr>
<tr>
<td>Condition of passerine vagrants on North Ronaldsay at first capture using fat score. K.F. Woodbridge and A.E. Duncan</td>
<td>5</td>
</tr>
<tr>
<td>Vagrancy of Yellow-browed Warbler Phylloscopus inornatus and Pallas’s Warbler Ph. proregulus in north-west Europe: Misorientation on great circles? K. Thorup</td>
<td>7</td>
</tr>
<tr>
<td>Biometrics, weights, breeding and moulting seasons of passerines in an Azores cloud forest. J.A. Ramos</td>
<td>17</td>
</tr>
<tr>
<td>Autumn movements of Citril Finch Serinus citrinella citrinella in the southern Alps. L. Fornasari, M. Carabella, W. Corti and F. Pianezza</td>
<td>23</td>
</tr>
<tr>
<td>Swallow Hirundo rustica with unmoulted greater coverts in spring. N. McCanch</td>
<td>30</td>
</tr>
<tr>
<td>Arrival patterns of male Willow Warblers Phylloscopus trochilus in relation to age, territory density and pairing success. M.R. Lawn</td>
<td>31</td>
</tr>
<tr>
<td>The analysis of primary moult using feather mass. C.P.F. Redfern</td>
<td>39</td>
</tr>
<tr>
<td>Site fidelity and survival of Purple Sandpipers Calidris maritima at Helgoland (SE North Sea). V. Dierschke</td>
<td>41</td>
</tr>
<tr>
<td>The invasion of Northern Bullfinches Pyrrhula p. pyrrhula to Britain in autumn 1994, with particular reference to the Northern Isles. R. Riddington and N. Ward</td>
<td>48</td>
</tr>
<tr>
<td>A comparison of body size in Cuckoos Cuculus canorus from the British Isles and the eastern Baltic area. V.A. Payevsky</td>
<td>53</td>
</tr>
<tr>
<td>Wing moult in a passage Kingfisher Alcedo atthis. J. Morgan</td>
<td>56</td>
</tr>
<tr>
<td>Wing formula of Reed Warblers Acrocephalus scirpaceus from Israel — a cautionary note. J. Morgan</td>
<td>57</td>
</tr>
<tr>
<td>Presence of juvenile shaped rectrices in known adult Firecrests Regulus ingnicapillus. J.A. Masero, S.R. Pizarro and F. Hortas</td>
<td>65</td>
</tr>
<tr>
<td>Geographical variation in pre-migratory conditions of Swallows Hirundo rustica in Italy. A. Pilastro, F. Spina and P. Micheloni</td>
<td>67</td>
</tr>
<tr>
<td>Biometric differences between Common Terns Sterna hirundo and Arctic Terns S. paradisaea. J.C.A. Craik</td>
<td>75</td>
</tr>
<tr>
<td>Skull ossification in a Chough. N. McCanch</td>
<td>79</td>
</tr>
</tbody>
</table>

### Part 2 (November 1998)

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rates of wear of incoloy and stainless steel rings on Turnstones Arenaria interpres. R.W. Summers and B. Etheridge</td>
<td>81</td>
</tr>
<tr>
<td>Winglength and undertail covert markings in the Skylark Alauda arvensis – a museum perspective. T.W. Dougall</td>
<td>86</td>
</tr>
<tr>
<td>Migration and arrival of immature Storm Petrels Hydrobates pelagicus in Shetland. J.A. Fowler and M.V. Hounsome</td>
<td>91</td>
</tr>
<tr>
<td>Bird Ringing in Britain and Ireland in 1996. M.P. Toms and J.A. Clark</td>
<td>95</td>
</tr>
<tr>
<td>Conference – 100 years of Bird Ringing – Second Announcement</td>
<td>168</td>
</tr>
</tbody>
</table>

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Part 3 (May 1999)

Biometrics and post-juvenile moult of the Goldcrest Regulus regulus. S.C.Norman ................. 175
The Mediterranean Storm Petrel Hydrobates pelagicus melitensis at Cabrera archipelago (Balearic Islands, Spain): breeding moult, biometry and evaluation of the population size by mark and recapture techniques. J.F. Amengual, G. Gargallo, M. Suárez, J. Bonnin, J.M. González, M. Rebassa and M. McMinn ................................................................. 181
Overseas movements to and from Britain by Greenfinches Carduelis chloris. I.G. Main .............. 191
Methods for ageing Dotterel Charadrius morinellus. D.P. Whitfield ......................................... 200
Sand Martin Riparia riparia – male or female? E. Cowley .......................................................... 205
Significance of ring removal in Africa for a Common Tern Sterna hirundo colony. H. Wendelin and P.H. Becker ...................................................................................... 210
Condition of passerine vagrants on North Ronaldsay: a comment. G. Scott ................................ 213
Condition of passerine vagrants on North Ronaldsay: reply. K.F. Woodbridge and A.E. Duncan 214

Part 4 (November 1999)

Funnel traps capture a higher proportion of juvenile Great Tits Parus major than automatic traps. J.C. Senar, J. Domenech and M.J. Conroy ......................................................... 257
Translocation of Canada Geese Branta canadensis in Great Britain. J.S. Kirby, W.G. Haines and G.E. Austin ................................................................. 261
Increased mortality of Woodpigeon Columba palumbus following ringing. G.C. Smith and I.R. Inglis .......................................................................................... 272
The seasonal pattern of numbers, population structure and migration of Purple Sandpipers Calidris maritima in Orkney. C.J. Corse and R.W. Summers ......................................... 275
Mass and visible fat scores of Skylarks Alauda arvensis in winter in south-east Scotland. T.W. Dougall ................................................................................................................. 283
Storm Petrel Hydrobates pelagicus rings in Great Black-backed Gull Larus marinus pellets. R.G. Adam and C.J. Booth ................................................................................ 298
Sex bias and seasonal patterns in tape-lured samples of migrating Skylarks Alauda arvensis. H. Scheckerman ......................................................................................... 299
Sexual dimorphism of Common Terns Sterna hirundo and Arctic Terns S. Paradisaea. J.C.A. Craik ......................................................................................................................... 311
First records of wing-moult in southern Europe of Red-rumped Swallow Hirundo daurica rufula O. Frias ............................................................................................................. 313
Nocturnal and diurnal activity patterns and roosting sites of Green Sandpipers Tringa ochropus wintering in southern England. K.W. Smith, J.M. Reed and B.E. Trevis ........ 315
Separation of Marsh Tits Parus palustris and Willow Tits Parus montanus. G.W. Scott .................................................. 323
Sexing first year Reed Buntings Emberiza schoeniclus using biometrics. C. Walton and P. Walton .................................................................................................................. 327

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Papers from Ringing Group Reports. B. Galpin ................................................................. 332

Supplement (November 1999)
Proceedings of the JNCC/BTO Workshop on the Conservation Uses of Ringing Data

The JNCC/BTO Workshop on the Conservation Uses of Ringing Data: an introduction.
S.R. Baillie and C.V. Wernham .............................................................................................. S1
Acknowledgement .................................................................................................................. S4
Development of the British and Irish Ringing scheme and its role in conservation biology.
S.R. Baillie, C.V. Wernham and J.A. Clark ......................................................................... S5
The requirements of the UK Statutory Conservation Agencies. G. Boobyer ................... S20
Value of ringing information for bird conservation in Europe. F. Spina .......................... S28
Ringing for conservation from the perspective of a volunteer ringer. G.F. Appleton ........ S41
Diagnosing the causes of bird population declines using comparative methods: the value of
data from ringing. R.E. Green .............................................................................................. S47
The use of ringing to monitor changes in the numbers and demography of birds.
W.J. Peach, R.W. Furness and A. Brenchley ................................................................. S57
Using ringing data to study the effect of hunting on bird populations.
N.J. Aebischer, G.R. Potts and M.M. Rehfisch ................................................................ S67
Conservation uses of ringing data: flyway networks for waterbirds.
N. Davidson, D.M. Bryant and G. Boere ........................................................................... S83
Conservation value of ringing seabirds in Britain and Ireland.
M.P. Harris and M.L. Tasker .............................................................................................. S95
Increasing the conservation value of ringing studies of passerines, with emphasis
on the non-breeding season. A.D. Evans, A.G. Gosler and J.D. Wilson ............................ S107
The Conservation Uses of Ringing Data. Conclusions of the JNCC/BTO Workshop,
4-5 November 1995, Norwich. S.R. Baillie, G. Boobyer, C.M. Perrins, A. Brenchley,
The Scientific Strategy of the BTO Ringing Scheme. S.R. Baillie, R.W. Furness, J.A. Clark,
R.E. Green, A.G. Gosler, S.J. Ormerod, W.J. Peach, D.A. Stroud, W.J. Sutherland
and J.D. Wilson ............................................................................................................... S129

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Ringing & Migration

Index to Volume 19

Compiled by Hugh Insley

All species of bird mentioned in the text are included except those mentioned in the 1996 and 1997 Ringing Reports. Page numbers given are those of the first mention of the species in each paper.

Accipiter nisus 41, S70
Acrócefalo arundinaceus 313
A. baeticatus 57
A. dumetorum 5, 57
A. schoenobaenus S34, S115
A. scirpaceus 5, 57, S32, S70, S134
Activity patterns 315
ADAM, R.G. and BOOTH, C.J. Storm Petrel Hydrobates pelagicus rings in Great Black-backed Gull Larus marinus pellets 298
AEBISCHER, N.J., POTTS, G.R. and REHFISCH, M.M. Using ringing data to study the effects of hunting on bird populations S67
African Reed Warbler 57
Age: determination 1, 65, 200; of first breeding 169, 202; ratio 275
Alauda arvensis 86, 283, 299, S27, S42, S51, S70, S109
Alca torda S97
Alcedo atthis 56
American Crow 1
Ammodytes marinus S103
Anas crecca S30, S59, S112
A. platyrhynchos S71
Anser brachyrhynchus S59, S112
A. caerulescens S73
Anthus pratensis S42, S70, S115
A. trivialis 305
APPLETON, G.F. Ringing for conservation from the perspective of the volunteer ringer. S41
Apus apus 59
A. pallidus 59
Aquila chrysaetos 169, S43
A. heliaca 173
Arctic Redpoll 5
Arctic Skua S97
Arctic Tern 75, 311, S57, S97, S126
Arctic Warbler 5
Ardea cinerea S59
Arenaria interpres 45, 81, 280
Ashy-headed Wagtail 67
AUSTIN G.E. (see KIRBY, J.S., HAINES, W.G. and AUSTIN, G.E.)
Azores Bullfinch 17

BAILLIE, S.R. and WERNHAM, C.V. The JNCC/BTO Workshop on the Conservation Uses of
Ringing Data: an introduction S1

BAILLIE, S.R., WERNHAM, C.V. and CLARK, J.A. Development of the British and Irish
Ringing scheme and its role in conservation biology S5

BAILLIE, S.R., BOOBYER, G., PERRINS, C.M., BRENCHLEY, A., BRYANT, D.M., ORMEROD, S.J.,
Conclusions of the JNCC/BTO Workshop, 4-5 November 1995, Norwich. S119

Peach, W.J., STROUD, D.A., SUTHERLAND, W.J. and WILSON, J.D. The Scientific
Strategy of the BTO Ringing Scheme S129

Bald Eagle 173


Barn Owl 188, S27, S59

BECKER, P.H. (see WENDELIN, H. and BECKER, P.H.)

Bewick’s Swan S91, S126

Bill: depth 18, 187; length 18, 187, 275

Biometrics 17, 23, 50, 59, 175, 187, 283, 327

Birds of Conservation Concern S15

Blackbird 39, S109, S135

Blackcap 5, 8, 17, 303, S30, S70

Black Guillemot S97

Black Kite S70

Black Rat 188

Black-tailed Godwit 13

Blue Tit 39, S8, S50, S109

Blyth’s Reed Warbler 5, 57

BOERE, G. (see DAVIDSON, N., BRYANT, D.M. and BOERE, G.)

Bonelli’s Warbler 5

BONNIN, J. (see AMENGUAL, J.F., GARGALLO, G., SUAREZ, M., BONNIN, J., GONZALEZ, J. M.
REBASSA, M. and MCMINN, M.)

BOOBYER, G. The requirements of the UK Statutory Conservation Agencies S20

BOOBYER, G. (see BAILLIE, S.R., BOOBYER, G., PERRINS, C.M., BRENCHLEY, A., BRYANT,

BOOTH, C.J. (see ADAM, R.G. and BOOTH, C.J.)

Brambling 5

Branta canadensis 261, S8

BRENCHLEY, A. (see PEACH, W.J., FURNESS, R.W. and BRENCHLEY, A.)

BRENCHLEY, A. (see BAILLIE, S.R., BOOBYER, G., PERRINS, C.M., BRENCHLEY, A., BRYANT,

Brood patch 30, 205

BRYANT, D.M. (see DAVIDSON, N., BRYANT, D.M. and BOERE, G.)

BRYANT, D.M. (see BAILLIE, S.R., BOOBYER, G., PERRINS, C.M., BRENCHLEY, A., BRYANT,

Bullfinch S51, S109

Burhinus oedicnemus S59

Buteo buteo 172, S70

Calidris alba 45, 281

C. alpina 44, S43, S91

C. canutus 81, 281, S23, S31, S86, S126

C. ferruginea 303, S31

C. maritima 41, 81, 275

C. mauri S92

Calonectris diomedia 181

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Canada Geese 261, S8
Cape Gannet S99
CARABELLA, M. (see FORNASARI, L., CARABELLA, M., CORTI, W. and PIANEZZA, F.)
Carduelis carduelis S70, S109
C. cannabina S16, S51, S70, S109
C. chloris 191, 295
C. flammae 5
C. f. flammae 51
C. hornemanni 5
C. spinus 33
Carrión Crow 3, 79
Catch bias 257, S50
Cepphus grylle S97
Certhia familiaris S63
CES (see Constant effort sites)
Chaffinch 17, S71, S109
Charadrius hiaticula 81
C. morinellus 200
Chiffchaff 5, S59
Chihuahuan Raven 1
Chough 79
Cinclus cinclus S112
Circus aeruginosus S70
Cirl Bunting S109
Citril Finch 23, 303
CLARK, J.A. (see TOMS, M.P. and CLARK, J.A.)
CLARK, J.A. (see TOMS, M.P., CLARK, J.A. and BALMER, D.E.)
CLARK, J.A. (see BAILLIE, S.R., WERNHAM, C.V. and CLARK, J.A.)
CLARK, J.A. (see BAILLIE, S.R., FURNESS, R.W., CLARK, J.A., GREEN, R.E., GOSLER, A.G.,
ORMEROD, S.J., PEACH, W.J., STROUD, D.A., SUTHERLAND, W.J. and WILSON, J.D.)
Coal Tit S8
Cold weather movement S32
Collared Dove S59, S73
Colour rings 306, S10, S20
Columba oenas S59, S73
C. palumbus 272, S59, S73
Common Buzzard 172, S70
Common Crossbill 295
Common Raven 2
Common Sandpiper 42
Common Snipe S14, S50, S71
Common Swift S9
Common Tern 75, 210, 311, S97, S126
CONROY, M.J. (see SENAR, J.C., DOMENECH, J. and CONROY, M.J.)
Constant effort sites 100, 218, S11, S21, S34, S61, S131
Cormorant S13, S97
Corn Bunting S51, S64, S109
CORSE, C.J. and SUMMERS, R.W. The seasonal pattern of numbers, population structure and
migration of Purple Sandpipers Calidris maritima in Orkney 275
CORTI, W. (see FORNASARI, L., CARABELLA, M., CORTI, W. and PIANEZZA, F.)
Corvus brachyrhynchos 1
C. caurinus 1
C. corax 1
C. corone cornix 1
C. c. corone 3, 79
C. cryptoleucus 1
C. frugilegus 79
C. monedula 39, 79
C. ossifragus 1
Cory's Shearwater 181
COSTA, L.T. and ELIAS, G.L. Biometrics and survival rates of Pallid Swifts Apus pallidus in Portugal 59
COWLEY, E. Sand Martin Riparia riparia – male or female? 205
CRAIK, J.C.A. Biometric differences between Common Terns Sterna hirundo and Arctic Terns S. paradisaea 75
CRAIK, J.C.A. Sexual dimorphism of Common Terns Sterna hirundo and Arctic Terns S. paradisaea 311
CROSS, T.F. (see O’DONOGHUE, P.D., CROSS, T.F. and O’HALLORAN, J.) Cuckoo 53
Cuculus canorus 53
Curlew 45, S88
Curlew Sandpiper 303, S31, Cygnus columbianus S91, S126
C. olor S8, S59

Dark-eyed Junco 293
DAVIDSON, N., BRYANT, D.M. and BOERE, G. Conservation uses of ringing data: flyway networks for waterbirds S83
Delichon urbica S133
DIERSCHKE, V. Site fidelity and survival of Purple Sandpipers Calidris maritima at Helgoland (SE North Sea) 41
Diomedea exulans S50
Dipper S112
Dispersal, post natal 169
DOMENECH, J. (see SENAR, J.C., DOMENECH, J. and CONROY, M.J.) Dotterel 200
DOUGALL, T.W. Winglength and undertail covert markings in the Skylark Alauda arvensis – a museum perspective 86
DOUGALL, T.W. Mass and visible fat scores of skylarks Alauda arvensis in winter in south-east Scotland 283
DUNCAN, A.E. (see WOODBRIDGE, K.F. and DUNCAN, A.E.) Dunlin 44, S43, S91
Dunnock S109

Eider S97, S126
ELIAS G.L. (see COSTA, L.T. and ELIAS, G.L.) Emberiza citrinella S109
E. citrinella S109
E. pusilla 5
E. schoeniclus 327, S16, S51, S109
Erithacus rubecula 3, 8, 26, S70, S109
ETHERIDGE, B. (see SUMMERS, R.W. and ETHERIDGE, B.) EVANS, A.D., GOSLER, A.G. and WILSON, J.D. Increasing the conservation value of ringing studies of passerines, with emphasis on the non-breeding season S107
Falco columbarius 45
Fat score 23, 30, 48, 67, 213, 283, S34, S113
Fattening, pre-migratory 275
Feather mass 39
Ficedula hypoleuca 3, 31, S70
Fieldfare S70
Firecrest 65
Fish Crow 1
FORNASARI, L., CARABELLA, M., CORTI, W. and PIANEZZA, F. Autumn movements of

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Citril Finch *Serinus citrinella citrinella* in the southern Alps 23

*Fratercula arctica* S97

FRIAS, O. First records of wing-moult in southern Europe of Red-rumped Swallow *Hirundo daurica rufula* 313

FOWLER, J.A. and HOUNSOME, M.V. Migration and arrival of immature Storm Petrels *Hydrobates pelagicus* in Shetland 91

Fringilla coelebs 17, S71, S109

*F. montifringilla* 5

Fulmar S97

*Fulmarus glacialis* S97

FURNESS, R.W. (see PEACH, W.J., FURNESS, R.W. and BRENCHLEY, A.)


Gallinago gallinago S14, S50, S71

*Gommarus pulex* 321

Gannet S97

Garden Warbler S33, S70


Garrulus glandarius 79

Gavia stellata S97

Goldcrest 5, 17, 175

Golden Eagle 169, S43

Goldfinch S70, S109


GOSLER, A.G. (see EVANS, A.D., GOSLER, A.G. and WILSON, J.D.)


GRANT, J.R. and MCGRADY, M.J. Dispersal of Golden Eagles *Aquila chrysaetos* in Scotland. 169

Great Black-backed Gull 298, S97

Great Reed Warbler 313

Great Skua S97

Great Tit 39, 257, S8, S109

GREEN, R.E. Diagnosing the causes of bird population declines using comparative methods: the value of data from ringing S47


Greenfinch 191, 295

Green Sandpiper 315

Grey Heron S59

Grey Partridge S50

Grey Plover 315

Guillemot S14, S97, S126

HAINES, W.G. (see KIRBY, J.S., HAINES, W.G. and AUSTIN, G.E.)

*Haliaeetus leucocephalus* 173

HARRIS, M.P. and TASKER, M. Conservation value of ringing seabirds in Britain and Ireland. S95

Head and bill length 75, 311

Herring Gull 306, S97

*Hippolais pallida* 57

*H. polyglotta* 5

*Hirundo daurica rufula* 313

*H. rustica* 30, 67, S109, S133

Hooded Crow 1
HORTAS, F. (see MASERO, J.A., PIZARRO, S.R. and HORTAS, F.)
HOUNSOME, M.V. (see FOWLER, J.A. and HOUNSOME, M.V.)
House Martin   S133
House Sparrow   S43,  S109
Hydrobates pelagicus  91, 181, 298, S97

INGLIS, I.R. (see SMITH, G.C. and INGLIS, I.R.)
Integrated Population Monitoring   S10, S131

Jackdaw   39, 79
Jack Snipe   S16, S77
Jay   79
Junco hyemalis   293

Kingfisher   56
KIRBY, J.S., HAINES, W.G. and AUSTIN, G.E.  Translocation of Canada Geese Branta canadensis
in Great Britain  261
Kittiwake   39, S97
Knot   81, 281, S23, S31, S86, S126
KRUK, M., NOORDERVLIET, M.A.W. and TER KEURS, W.J.  Natal philopatry in the Black-tailed
Godwit Limosa limosa L. and its possible implications for conservation  13

Lanius collurio   S109
L. senator   56
Lapwing   316, S26, S59
Larus argentatus   306, S97
L. fuscus  306, S97
L.cachinnans michaelis   188
L. marinus   298, S97
LAWN, M.R.  Arrival patterns of male Willow Warblers Phylloscopus trochilus in relation to age,
territory density and pairing success  31
Leach’s Petrel   S97
Lesser Black-backed Gull   306, S97
Lesser Sandeel   S103
Lesser Snow Goose   S73
Lesser Whitethroat   S32, S109
Limosa limosa   13
Linnet   S16, S51, S70, S109
Little Bunting   5
Little Tern   S97
Locustella fluviatilis   5
Long-billed Curlew   15
Loxia curvirostra   295
Lymnocryptes minimus   316, S77

MCCANCH, N.  Swallow Hirundo rustica with unmoulted greater coverts in spring. 30
MCCANCH, N.  Skull ossification in a Chough  79
MCGRADY, M.J. (see GRANT, J.R. and MCGRADY, M.J.)
MCMINN, M. (see AMENGUAL, J.F., GARGALLO, G., SUAREZ, M., BONNIN, J., GONZALEZ,
J.M., REBASSA, M. and MCMINN, M.)
Magpie   79
MAIN I.G.  Overseas movements to and from Britain by Greenfinches Carduelis chloris   191
Mallard   S71
Manx Shearwater   S97, S126
MAPS (see Monitoring Avian Productivity and Survivorship)
Mark recapture   181
Marsh Harrier   S70

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Marsh Tit 323
MASERO, J.A., PIZARRO, S.R. and HORTAS, F. Presence of juvenile shaped rectrices in known adult Firecrests Regulus ingnicapillus 65
Mass 17, 23, 30, 48, 53, 59, 67, 175, 187, 278, 283, 327
Meadow Pipit S42, S70, S115
Mealy Redpoll S1
Mediterranean Storm Petrel 181
Melodious Warbler 5
Merlin 45
MICHELONI P. (see PILASTRO, A., SPINA, F. and MICHELONI, P.)
Migration, autumn 299
Miliaria calandra S51, S64, S109
Milvus migrans S70
M. milvus S70
Mistle Thrush S109
Monitoring avian productivity and survivorship S34
MORGAN, J. Wing moult in a passage Kingfisher Alcedo atthis 56
MORGAN, J. Wing formula of Reed Warblers Acrocephalus scirpaceus from Israel – a cautionary note 57
Mortality 272, S67
Morus bassanus S97
M. capensis S97
Motacilla alba yarrellii S109
M. flava S109
M. flava cinereocapilla 67
Moult: 17; interrupted 30, 56, 67, 313; post-juvenile 175; post-nuptial 67; primary 39, 56, 67, 313; score 39
Muscicapa striata S16, S109
Mute Swan S8, S59
Northern Bullfinch 48
NOORDERVLIET, M.A.W. (see KRUK, M., NOORDERVLIET, M.A.W. and TER KEURS, W.J.)
NORMAN, S.C. Biometrics and post-juvenile moult of the Goldcrest Regulus regulus 175
Northern Raven 1
Northwestern Crow 1
Numenius americanus 15
N. arquata 45, S88
N. phaeopus 315
Nuthatch S8
Oceanodroma leucorhoa S97
O. tristriata 186
O’DONOGHUE, P.D., CROSS, T.F. and O’HALLORAN, J. Bill colour as an ageing technique in the Hooded Crow Corvus corone corax: a cautionary note 1
Oenanthe oenanthe S70
O’HALLORAN, J. (see O’DONOGHUE, P. D., CROSS, T. F. and O’HALLORAN, J.)
Orientation 7
Pallas’s Warbler 5, 7
Pallid Swift 59
Parus caeruleus 39, S50, S109
P. major 39, 257, S109
P. montanus 294, 323, S51
P. palustris 323
Passer domesticus S43, S109
P. hispaniolensis 5
P. montanus S16, S109
PAYEVSKY, V.A. A comparison of body size in Cuckoos Cuculus canorus from the British Isles and the eastern Baltic area 53
PEACH, W.J., FURNESS, R.W. and BRENCHLEY, A. The use of ringing to monitor changes in the numbers and demography of birds S57
Pellets 298
Perdix perdix S51
Phalacrocorax aristotelis S59, S97, S126
P. carbo S13, S97
Philomachus pugnax S36
Philopatry 13, 173, 181
Phoenicurus phoenicurus S70
Phylloscopus bonelli 5
P. borealis 5
P. collybita 5, S59
P. inornatus 7
P. prrregulus 5, 7
P. schwarzi 5
P. sibilatrix 36
P. trochilus 5, 31, 179, S35, S62, S70
PIANEZZA, F. (see LORENZO, F., CARABELLA, M., CORTI, W. and PIANEZZA, F.)
Pica pica 79
Pied Flycatcher 3, 31, S8, S70
Pied Wagtail S109
PILASTRO, A., SPINA, F. and MICHELONI, P. Geographical variation in pre-migratory conditions of Swallows Hirundo rustica in Italy 67
Pink-footed Goose S59, S112
Plectrophenax nivalis 294
Pluvialis squatarola 315
Polygyny 34
Population decline S41, S47
Population structure 275
POTTS, G.R. (see AEBISCHER, N.J., POTTS, G.R. and REHFISCH, M.M.)
Prunella modularis S109
Puffin S97
Puffinus puffinus S97, S126
Purple Sandpiper 41, 81, 275
Pyrrhocorax pyrrhocorax 79
Pyrrhula murina 17
P. pyrrhula 48, S51, S109
Radde’s Warbler 5
Radio tags 169, 315, S140
RAMOS, J.A. Biometrics, weights, breeding and moulting seasons of passerines in an Azores cloud forest 17
RAS (see Ringing adults for survival)
Rattus rattus 188
Razorbill S97

© 1998 & 1999 British Trust for Ornithology, Ringing & Migration, 19
Recovery rate 184, 211, 306
Rectrices 65
Red-backed Shrike S109
REDFERN, C.P.F. The analysis of primary moult using feather mass 39
Red Kite S70
Redpoll 5
Red-rumped Swallow 313
Redshank 201, 315
Redstart S70
Red-throated Diver S97
Redwing S70
REED, J.M. (see SMITH, K.W., REED, J.M. and TREVIS, B.E.)
Reed Bunting 327, S16, S51, S109
Red Warbler 5, 57, S32, S70, S134
Regulus ignicapillus 65
R. regulus 5, 17, 175
REHFISCH, M.M. (see AEBISCHER, N.J., POTTS, G.R. and REHFISCH, M.M.)
RIDDINGTON, R. and WARD, N. The invasion of Northern Bullfinches Pyrrhula p. pyrrhula to Britain in autumn 1994, with particular reference to the Northern Isles 48
Ringed Plover 81
Ringing adults for survival 97, 221, S11, S21, S133
Ring removal 210
Riparia riparia 63, 205, S43, S133
Rissa tridactyla 39, S97
River Warbler 5
Robin 3, 8, 26, S70, S109
ROCK, P. The efficacy of the colour-ringing system used for Herring Gulls Larus argentatus and Lesser Black-backed Gulls Larus fuscus in Bristol 1980-1997 306
Rook 79
Roseate Tern S97
Ruff S56
Sanderling 45, 281
Sand Martin 62, 205, S43, S133
Sandwich Tern 211, S97
Satellite tracking S140
Saxicola rubetra 3
S. torquata S43, S64
SCHÈKERMANN, H. Sex bias and seasonal patterns in tape-lured samples of migrating Skylarks Alauda arvensis 299
Scolopax rusticola 316, S14, S59, S71
SCOTT, G.W. Condition of passerine vagrants on North Ronaldsay: a comment. 213
SCOTT, G.W. Separation of Marsh Tits Parus palustris and Willow Tits Parus montanus 323
Sedge Warbler S34, S115
SENAR, J.C., DOMENECH, J. and CONROY, M.J. Funnel traps capture a higher proportion of juvenile Great Tits Parus major than automatic traps 257
Serinus citrinella 23, 303
Sex: bias 13, 280, 299; determination 205, 327; dimorphism 283, 311; ratio 48
Shag S59, S97, S126
Site fidelity 41
Skull: ossification 79; pneumatisation 86
Skylark 86, 283, 299, S27, S42, S51, S70, S109
SMITH, G.C. and INGLIS, I.R. Increased mortality of Woodpigeon Columba palumbus following ringing 272
SMITH, K.W., REED, J.M. and TREVIS, B.E. Nocturnal and diurnal activity patterns and roosting sites of Green Sandpipers *Tringa chloropus* wintering in southern England 315
Snow Bunting 294
*Somateria mollissima* S97, S126
Song Thrush 89, S12, S26, S51, S59, S69, S109, S135
Spanish Imperial Eagle 173
Spanish Sparrow 5
Sparrowhawk 41, S70
SPINA, F. (see PILASTRO, A., SPINA, F. and MICHELONI, P.)
SPINA, F. Value of ringing information for bird conservation in Europe S28
Spotted Flycatcher S16, S109
Starling 89, S29, S43, S109, S135
*Stercorarius parasiticus* S97
*S. skua* S97
*Sterna albifrons* S97
*S. dougallii* S97
*S. hirundo* 75, 210, 311, S97, S126
*S. paradisaea* 75, 311, S57, S97, S126
*S. sandvicensis* 211, S97
Stock Dove S59, S73
Stonechat S43, S64
Stone Curlew S59
Storm Petrel 91, 181, 298, S97
*Streptopelia decaocto* S59, S73
*Strix aluco* S59
*Sturnus vulgaris* 89, S29, S43, S109, S135
Subalpine Warbler 5
SUMMERS, R.W. and ETHERIDGE, B. Rates of wear of incoloy and stainless steel rings on Turnstones *Arenaria Interpres* 81
SUMMERS, R.W. (see CORSE, C.J. and SUMMERS, R.W.)
Survival rate 41, 59, S59, S67, S72, S112
Swallow 30, 67, S109, S133
Swift Migration Enquiry S5
*Sylvia atricapilla* 5, 8, 17, 303, S30, S70
*S. borin* 5, S33, S70
*S. cantillans* 5
*S. communis* 31, S34, S109
*S. curruca* S32, S109
Tape lures 68, 91, 181, 299
Tarsus length 187
TASKER, M.L. (see HARRIS, M.P. and TASKER, M.L.)
TER KEURS (see KRUK, M., NOORDERVLIET, M.A.W. and TER KEURS, W.J.)
Tawny Owl S59
Teal S30, S59, S112
THORUP, K. Vagrancy of Yellow-browed Warbler *Phylloscopus inornatus* and Pallas's Warbler *Ph. proregulus* in north-west Europe: Misorientation on great circles? 7
TOMS, M.F. and CLARK, J.A. Bird Ringing in Britain and Ireland in 1996 96

Translocation 261
Transponders, passive 210
Tree Creeper 563
Tree Pipit 303
Tree Sparrow S16, S51, S109
TREVIS, B.E. (see SMITH, K.W., REED, J.M. and TREVIS, B.E.)
Tringa hypoleucus 542
T. ochropus 315
T. totanus 201, 315
Tristram’s Storm Petrel 186
Troglogynes troglodytes S63, S109
Turdus iliacus S70
T. merula 39, S109, S135
T. philomelos 89, S12, S26, S51, S59, S69, S109, S135
T. pilaris S70
T. viscivorus S109
Turnstone 45, 81, 280
Tyto alba 188, S27, S59

Undertail coverts 86
Uria alge S14, S97, S126
Vanellus vanellus 316, S26, S59

Wandering Albatross S51
WALTON, C. and WALTON, P. Sexing First Year Reed Buntings Emberiza schoeniclus using biometrics 327
WARD, N. (see RIDDINGTON, R. and WARD, N.)
WENNELIN, H. and BECKER, P.H. Significance of ring removal in Africa for a Common Tern Sterna hirundo colony 210
WERNHAM, C.V. (see BAILIE, S.R. and WERNHAM, C.V.)
WERNHAM, C.V. (see BAILIE, S.R., WERNHAM, C.V. and CLARK, J.A.)
Western Sandpiper S92
Wheat ear S70
Whimbrel 315
Whinchat 3
Whitethroat 31, S34, S109
WHITFIELD, D.P. Methods for ageing Dotterel Charadrius morinellus 200
Willow Tit 294, 323
Willow Warbler 5, 31, 179, S35, S62, S70
WILSON, J.D. (see EVANS, A.D., GOSLER, A.G. and WILSON, J.D.)
Wing area 75
Wing breadth 75
Wing formula 57
Wing length 18, 23, 30, 48, 53, 59, 75, 86, 187, 299, 323, 327
Wing tags S20
WOODBRIDGE, K.F. and DUNCAN, A.E. Condition of passerine vagrants on North Ronaldsay at first capture using fat score 5
WOODBRIDGE, K.F. and DUNCAN, A.E. Condition of passerine vagrants on North Ronaldsay: reply 214
Wood pigeon 272, S59, S73
Woodchat Shrike 56
Woodcock 316, S14, S59, S71
Wood Warbler 36
Wren  S63, S109

Yellow-browed Warbler  7
Yellowhammer   S109
Yellow-legged Gull  188
Yellow Wagtail   S109