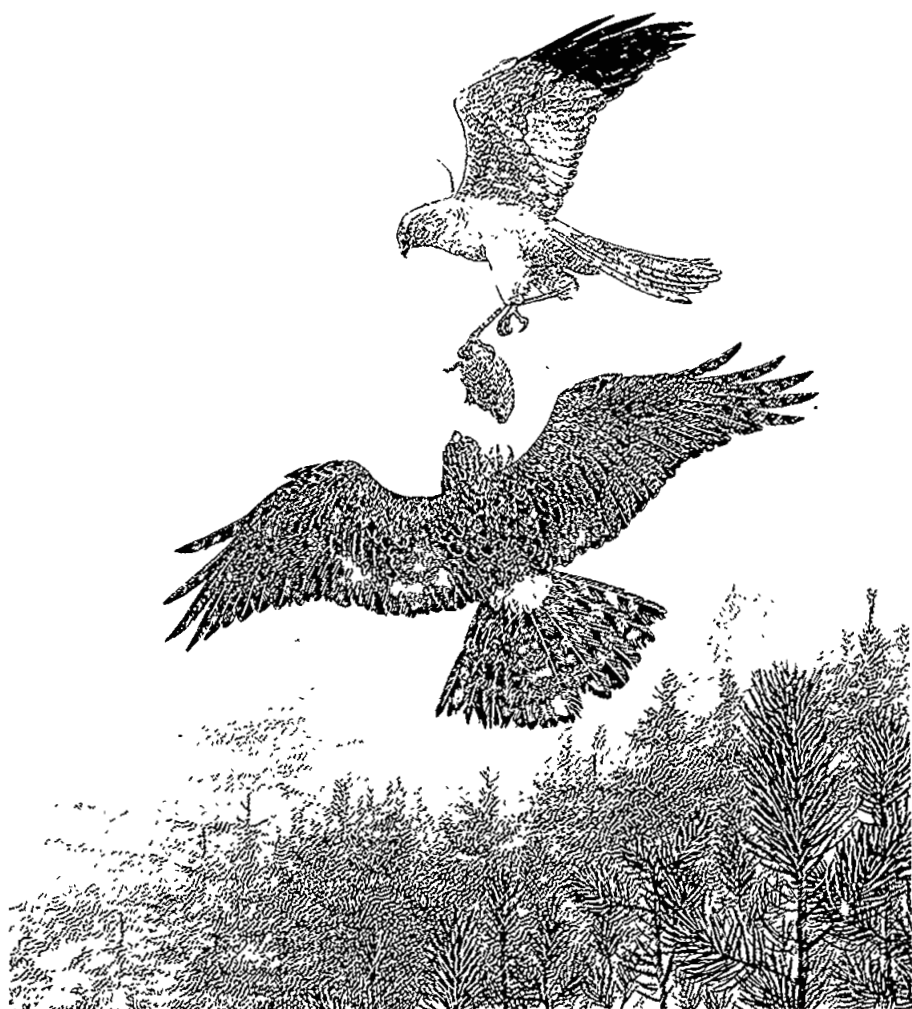


THE FOURTH ARGYLL BIRD REPORT



**PUBLISHED BY
THE ARGYLL BIRD CLUB**

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THE FOURTH ARGYLL BIRD REPORT

PUBLISHED BY THE ARGYLL BIRD CLUB

**EDITED BY DR. C.A. GALBRAITH AND
DR. A.R. JENNINGS.**

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INTRODUCTION

This is the fourth year that the Argyll Bird Report has been published by the Argyll Bird Club. This year's report contains the annual list of species seen in Argyll as well as details of birds ringed and recovered during 1986. This is then followed by a series of papers covering subjects as diverse as 'The ecology of the Mink', 'Corncrake numbers on Islay', and 'Forestry and wildlife'.

The papers on Forestry and wildlife are reports of talks given at the Argyll Bird Club/Cowal Natural History Society meeting on that subject held in Dunoon on 12th April 1986. This meeting was organised with the aim of bringing together the forestry industry, the local birdwatching community and the general public, to discuss the interactions between forestry and wildlife, and, importantly, to examine how policies sympathetic to wildlife could be integrated into the overall afforestation plan. The success or otherwise of such meetings can only be judged by changes on the ground in years to come. It seems sensible to publish these 'forestry' papers in this report in the hope that they may lead to a more educated debate on the subject in future. Indeed we use this same argument for publishing all sections of this report and would hope to demonstrate, perhaps especially to the local population, just how important Argyll is for many bird species. These species rely on the surrounding habitats for their survival, hence much of local conservation concentrates on saving valuable habitats which may be under some kind of threat.

If you would like to help us promote an interest in birds and their habitats in Argyll then I suggest you write to our membership secretary, Jane Eccles, Roineachail, Benderloch, Oban, who will send you details of club activities and subscription rates.

Production of the report, has, as usual been a team effort and one in which I played only a minor part this year. Thanks go to Arthur Jennings assisted by Roger Broad and Mike Madders for compilation of the species list and for help with other sections of the report, and to Clive Craik for producing the ringing report. I would also like to thank those people who submitted papers for inclusion in this report and invite others to submit papers for inclusion in the next report, as soon as possible.

The excellent sketches used to illustrate the report were drawn by Philip Snow, who is a professional bird artist. Philip specialises in birds of the west coast and has had many of his works published in books and journals. His work greatly enhances the presentation of our report this year.

We have tried to improve both content and presentation of the Bird Report with each year's production, however we recognise that further improvement is always possible. To enable us to do this, please let us have your thoughts on this year's report (in as polite a form as possible!). Finally, please send all records of birds seen, to the county recorder at regular intervals through the year.

With best wishes for a successful year's watching.

COLIN A. GALBRAITH.
MINARD, MAY 1987.

ARGYLL BIRD REPORT 1986

SYSTEMATIC LIST. A.R. Jennings

INTRODUCTION

The sequence of species follows the Voous order and the Euring code is given for each species. Each species entry is preceded by details of status so far as is known and is intended to give a general picture of the distribution and abundance of each species within Argyll. It is probable that this information will require to be amended as more records are received.

Abbreviations are defined as follows:

R Resident

B Breeding species. Non-migratory but breeding and wintering areas within Argyll may differ.

S Summer visitor. Breeds but does not winter

W Winter visitor. Winters but does not breed in Argyll.

P Passage. Birds seen on passage at migration times, but does not usually occur in summer or winter months.

Irregular. Refers to birds that are unpredictable in the timing, location or number of occurrences.

Scarce. These species are found at only a few sites in Argyll and generally in small numbers.

Rare. These species are usually annual, one or two occurring somewhere in the County.

Vagrant. These species are not seen on an annual basis.

SBRC. Scottish Birds Record Committee.

BBRC. British Birds Rarities Committee.

M. Male.

F. Female.

The areas covered by the Report are as follows:

Kintyre: Mainland and inshore islets south of a line between Tarbert and West Loch Tarbert including Gigha and Sanda.

Islay: Also includes Jura, Colonsay and associated sea areas and small islets.

Cowal: but not including Bute.

Mull: Also includes Coll, Tiree, Iona, Ulva, Staffa and the Treshnish Isles together with the associated sea and smaller islands.

Mid and North Argyll: Also includes Lismore but not Morvern which is now part of Highland region.

Acknowledgements

I am grateful to all those listed below who submitted records during the year. In particular I would like to express thanks to John and Pamela Clarke, (Colonsay & Oronsay) A.G. Gordon, David & Jean Jardine (Colonsay and Oronsay), Mike Madders, (Mull, Coll, Tiree & Garvellachs), Les Street and Peter Moore (Islay) and R. and J. McNab (Islay), whose detailed compilations made the making of the Systematic List easier. P. Moore kindly provided information from the RSPB L. Gruinart Reserve and also provided the wader, gull and waterfowl tables, for the reserve, David Stroud provided Table 4. Roger Broad and Mike Madders kindly read drafts of the Systematic List and made many helpful comments and suggestions. I am pleased to take this opportunity to thank them for all the effort they put into this. Any mistakes which remain, however, are my responsibility.

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Thanks also to the contributors to the Milbuie Log and to the Scottish Conservation Projects Task Group and finally apologies to any contributor whose name has been inadvertently missed from the list.

Argyll Bird Report 1987

All records for 1987 should be sent to the Recorder, Dr. A.R. Jennings, 1 Ferryfield Drive, Connel by Oban, Argyll, PA37 1SP. Tel. Connel 576, not later than 31 Jan 1988. Written descriptions of species which appear on the BBRC and the SBRC's lists should be sent to him in the first instance. Forms for this can be obtained on request.

0002 RED-THROATED DIVER *Gavia stellata*

B.W. & P. Widely distributed but sparse. Susceptible to disturbance.

Over 30 records mainly singles, from the islands and mainland (all months) but including the following counts: 2 Ganavan Bay 2 Feb., 7 Oban Bay-Dunstaffnage 7 Mar., 2 Port Ellen, Islay, 16 Mar., 2 Gigha- W.L. Tarbert 16 Mar., 2 L. Fada, Colonsay 13 Jun., 2 L. Neil 13 Aug., 17 (S) off Frenchman's Rocks 19 Sep., 3 W.L. Tarbert 17 Oct., 13 around Tiree coast 31 Dec. Breeding confirmed on Coll (successful), Mull 3 sites confirmed and 5 other probable sites, but no chicks seen.

A survey in 1985 (see Argyll Bird report 1985) revealed a possible breeding population of 70-100 prs.



0003 BLACK-THROATED DIVER *Gavia arctica*

B.W.P. Very scarce breeder, very susceptible to disturbance.

Over 15 records mainly coastal during the winter period. Reports included: 1 Craignish 3 Jan., 7 Gigha- W.L. Tarbert 16 Mar., 1 Colonsay 4 & 10 Apr., 1 Musdale 15 Apr., 1 L. Arail (fresh water) 19 Jun., 1 Camas Bay 5 Jul., 1-2 L. Feochan 8 Aug., 1 Cloanig 19 Aug., 17 Kennacraig-Islay 14 Nov., 3 off Tiree 31 Dec.

Seven breeding prs. were monitored: 5 prs. are known to have laid eggs but only one pr. was successful, fledging a single chick. The most likely reasons for failure are flooding (1), disturbance by fishermen (1), disturbance by birdwatchers (1), and unknown (1), RSPB.

0004 GREAT NORTHERN DIVER *Gavia immer*

W.P. Argyll coast important wintering area. Mainly present May-Sep., few may summer.

1-2 reported from wide area in winter; max. counts 75 W.L. Tarbert 16 Mar., 10 L. Scridain and 10 L. na Keal 22 Feb., 9 Colonsay-Oronsay 9 Apr., and 6 Kennacraig-Islay 14 Nov. Birds in S. Plumage off Mull coast Apr-May, last spring record 3 off Iona 21 May and first returning birds in autumn 2 L. na Keal 12 Oct.

0005 WHITE-BILLED DIVER *Gavia adamsii*
V.

Single Ad. L. Indaal, Islay, 27 Mar. (JD.PM.) Subject to BBRC.

0007 LITTLE GREBE *Tachybaptus ruficollis*

B & W. Breeds on many of the smaller lochs which are mainly small, low lying and eutrophic. Widespread in winter in small numbers in small bays of sea lochs.

Singles recorded from many areas, chiefly winter months; larger counts include: 22 L. Etive 17 Jan., max. 6 L. Gruinart, Islay, Feb., 16 Lochdon, Mull 6 Mar. (figures exceed known breeding

population of Mull) 5 Ardmure Loch, Islay, 14 Sep., 4 Ballygrant Loch, Islay 17 Sep. Breeding reported from Lochan Tainish, Lochan nan Drimnean, Glencruitten. Carsaig, Colonsay (min. 3 prs) and Mull.

0009 GREAT CRESTED GREBE *Podiceps cristatus*
V.

Singles. L. Gilp, Lochgilphead 14 Feb. and L. Indaal, Islay 17 Nov.

0010 RED-NECKED GREBE *Podiceps grisegena*
V.

Single West L. Tarbert 15 Mar.

0011 SLAVONIAN GREBE *Podiceps auritus*

W & P. Regular in winter in some sea lochs, especially L. Indaal and around Mull.

Islay; 2 L. Indaal, 16 Mar., and 15 there 15 Nov. 2 L. Gruinart 15 Nov. Mull: max. 9 Loch na Keal, 19 Feb., and 2 L. Spelve, 3 Apr., 2 L. Ba (fresh water) 7 Apr., 2 L. Spelve 6 Oct. and 4 on 14 Nov. Mainland Argyll: 11 Upper L. Sween Feb. 2, W.L. Tarbert 16 Mar., 1 Ballochroy 14 Nov., 6 Ardmucknish Bay 21-31 Dec.

0012 BLACK-NECKED GREBE *Podiceps nigricollis*

W. & P in Kintyre Islay and Mull but rare and irregular. Last record 1982.

0020 FULMAR *Fulmaris glacialis*

B.W. & P. Coastal areas particularly Islay, Mull and Kintyre. 968 occupied sites counted Colonsay (698 in 1985) c.10 Keil Point 20 Aug. Bred W. coast Kintyre. Bred Gigha (c.40 prs.) 540+ occupied sites around Tiree plus inland site. 91 sites occupied Coll, Jul., 327 sites occupied Mull and 734-774 on Treshnish Isles. c. 40 on cliffs Bellochentery 5 Feb. Single *Blue phase* Tiree 1 Jun.

0036 CORY'S SHEARWATER *Calonectris diomedea*

P. Irregular and scarce.

No records since 1981.

0040 GREAT SHEARWATER *Puffinus gravis*

P. Irregular. Mainly off West Coasts of Mull and Islay. No records 1986.

0043 SOOTY SHEARWATER *Puffinus griseus*

P. off western islands and Kintyre. Fairly regular late summer.

9 between Tobermory-Tiree 11 Aug. 2 Coul Point, Islay 23 Sep. 4(S) off Frenchman's Rocks 19 Sep.

0046 MANX SHEARWATER *Puffinus puffinus*

B. P. except Cowal.

62 off Tiree 11 May. Steady passage past E. Oronsay 12 May, c.200 from Oban-Colonsay Ferry 27 May, 1800-1900 off Garvellachs 27 Jun. 23(S) off Frenchman's Rocks, Islay, 19 Sep. Est. 200+ breeding prs. Lunga, Treshnish Isles 21-27 Jun.

0052 STORM PETREL *Hydrobates pelagicus*

B. P. off western coasts, breeding birds come ashore late May/June. Passage Aug.-Sept.

c.7 off Frenchman's Rocks 19 Sep. Est. 2000 birds in colony Lunga Jun.

0055 LEACH'S PETREL *Oceanodroma leucorhoa*

V.

Single (SE) Lismore 9 Aug. (MM), first record since 1984

0071 GANNET *Sula bassana*

S. P. Nearest colony Ailsa Craig.

c. 20 Holy Loch, 17 May. Single L. Gruinart reserve 26 May. Up to 6 regular fishing off Colonsay mid May-mid Sep. Birds fishing inshore waters Mull May-Sep. Single dead, L. Crinan 24 Aug. ringed Ailsa Craig 11 Sep. 1975.

0072 CORMORANT *Phalacrocorax carbo*

R. & W. Much less common than Shag. Small nos. may occur on some fresh water lochs inland. Movement to coastal waters in Autumn. Small nos. L. Long much of year, 6 Pass of Brander 11 Feb. Present L. Taynish thro yr. and L. Gruinart reserve with max 6 in Nov. Report from Colonsay "seems to be declining in nos." Max count 46 Heanish (Tiree) 7 Dec., but no evidence of breeding Tiree, breeding suspected W. & SW. Mull.

0080 SHAG *Phalacrocorax aristotelis*

R. & W. Very common.

Max c.200 Campbeltown 19 Aug., c.60 Connel Ferry thro' winter, 25 non-breeders Ardskenish 4 Jun. 27 Oban Bay-Ganavan Bay 30 Dec. Numerous corpses found in Spring in Colonsay — sometimes well inland. 120 nests there compared with 230 in 1985. 148 nests Treshnish Isles and 50+ nests Tiree.

0093 BITTERN *Botaurus stellaris*

V. No records since 1982.

0121 GREAT WHITE EGRET *Egretta alba*

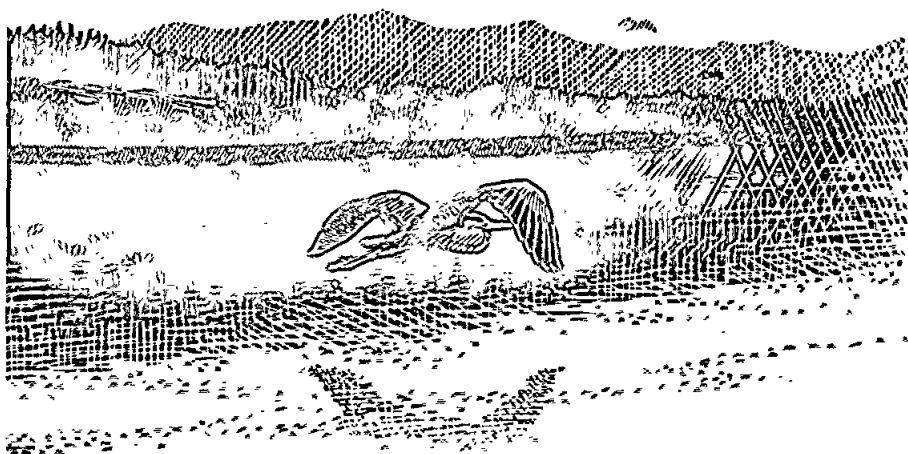
V.

Single record, Gruinart Flats (GJ. & PM.) 15 Jun. Subject acceptance by BBRC.

0122 GREY HERON *Ardea cinerea*

R. & W. Widespread.

Breeding information: Gigha 2 young, Ardachy 10 nests, Ballachuan 6 nests, Colonsay 20 birds present at nest sites but only 8 nests used. Mull breeding at 11 colonies with at least 47 occupied nests. Counts. L. Long max. 6 thro year, 18 L. Awe islands 2 Oct., 14 Minard 3 Oct., 25 Holy Loch 7 Oct., max 15 L. Gruinart reserve Oct.



0134 WHITE STORK *Ciconia ciconia*

V. No records since 1981.

0152 MUTE SWAN *Cygnus olor*

R. W. Widespread but scarce breeding species.

See Tables.

Successful breeding at L. Etive, Holy Loch, Gigha, L. Gilp, Bellanoch, Craob Haven, Ormsary, West L. Tarbert, Inverary, L. Nell, Glen Cruitten. No. successful breeding Mull, but 8 prs. resident; at least 3 prs. breeding Tiree (results not known). Poor breeding yr. Islay one successful pr. out of five. 6 prs. resident Gigha.

Counts. 6 L. Gilp Jun., 2 Barnakil, Jul., 56 ads. 5 cygnets, including collars TF3 & KK, on Tiree 5-12 Jul. Max. 4 W.L. Tarbert 7 Aug., 3 Inverneil 7 Aug., 10 Musdale 7 Aug., 6 Bellanoch 8 Aug., 7 Ardfern 14 Aug., 10 L. Sween Sep., max, 28 L. Etive 14 Sep., 2 Caol Scotnish 16 Sep., 2 L. Melfort 30 Sep., 17 Crinan Bridge/Dutruine 9 Dec., 6 L. Feochan 11 Dec., 5 Linne Mhuirich 26 Dec., 5 Inverary 21 Dec., 1 Tayvallich 26 Dec., 2 R. Add Sep. & Dec., max. 7 Linne Mhuirich thro yr. 14-20 Craignish Bay winter.

0153 BEWICK'S SWAN *Cygnus columbianus*

P. Irregular in Mid-Agryll, Kintyre and Islay.

No records submitted.

0154 WHOOPER SWAN *Cygnus cygnus*

W. & P. Occasional non breeder may summer.

See Tables.

Scattered winter records included 8 Glen Lonan 17 Jan., 2 L. Feochan 17 Jan., 22 Ad. 4 Juvs. L. Awe 7 Mar., 1 Kiloran Fields Colonsay, 8 Apr., and 10 ads+2imms. Kilmichael Glen 20 Apr. Summer records included 1 L. Gorm, Islay 23 Jun. and c.8 individuals summered Tiree. Autumn/winter: first arrival Mull with 6 Scallastle Bay 9 Sep.; main passage recorded second half of Oct. with flocks recorded in several areas including 19 Benderloch 19 Oct. and 17 on 31 Oct. Mull had flocks of 44 Torrloch, 15 L. na Keal and 11 Pennygowan 18-19 Oct. Islay recorded 10 L. Indaal 11 Oct., 6 on 15 Oct., 21 on 19 Oct., 14 L. Gruinart 16 Oct., 67 on 22 Oct., 64 Gladville 10 Nov., and max. 150 L. Gruinart late Nov. On Colonsay c.33 on passage 17 Sep.-11 Nov., with small nos. remaining to end Dec. Tiree held 93 ads.+6 imms. on 31 Dec. Other Nov.-Dec. records: 3 Southend 4 Nov., 8 on 13 Dec., 20 Gigha 12 Dec., 12 on 22 Dec., and 10+ Tayvallich Dec.

0157 BEAN GOOSE *Anser fabialis*

Irregular or Vagrant on passage.

No records submitted.

0158 PINK-FOOTED GOOSE *Anser brachyrhynchus*

P. & W. Islay, Mull, and Mid Argyll.

See Tables.

Singles Tiree 3 Jan., and 9 Apr. 3 Gallenach, Coll 10 Apr., c.70 L. Indaal 14 Sep., and c.120 there 16 Sep. and 2-3 present amongst Barnacles winter. Small group over Oronsay 2 Oct.

0159 GREENLAND WHITE-FRONTED GOOSE *Anser albifrons*

W. Except Cowal. County is the most important wintering area for the species and holds c.80% of British population.

See Tables.

The totals for all the regular Argyll wintering haunts have been summarised by David Stroud: Winter/Spring 1986: 7,562, Autumn/Winter 1986: 8,325. Some individual sites held: 75 Eriska, Benderloch 25 Jan., 40 Keil 26 Jan., 28 L. Assapol Mull 24 Jan. (one of two regular wintering sites on Mull) 485 Machrihanish-Campbeltown 5 Feb. 200 Rhunahaorine 5 Feb., 365 (5 flocks) Tayinloan 15 Apr., 396 Coll in Apr., 30-40 wintered Colonsay and 70 on 8 Apr. were pre-

sumably on passage. The first returning birds were 20 Benderloch 17 Oct. and c.95 Benderloch 21 Nov.: c.110 on Colonsay mid Nov.-Dec. were much higher than spring counts there; 73 Fiden-mull 23 Dec., 8 Dunadd 15 Dec., 53 Crinan Moss Dec., 396 Tiree 31 Dec.

A EURASIAN WHITEFRONTED GOOSE was recorded from Octovullin, L. Skerrols Islay 15 Mar. (MAO.AH.DLC.HB.)

0160 LESSER WHITEFRONTED GOOSE *Anser erythropus*
V.

Single. Octavullin nr. L. Skerrols Islay, 15 Mar. (MAO.HB.DLC.AH.) with single Eurasian Whitefront and 24 Greenland Whitefronts (subject to BBRC.)

0161 GREYLAG GOOSE *Anser anser*

B.W.P. Regular breeding Coll, Tiree, occasionally elsewhere.

See Tables.

Counts: 2 Holy Loch 4 Feb. 20(W). Kerrera Sound 5 Feb., 83 Machrihanish 5 Feb., 750 Bridgend, mid Argyll, 7 Feb. flocks totalling 258 Crinan Moss 28 Feb., 70 Tiree 8-9 Apr., 176 Coll 8-10 Apr., 12 Kiloran Fields Colonsay 8 Apr. 60(N) Lochdon Mull, 19 Apr., 10 Tayinloan 15 Apr. c.100 Arinagour, Coll 12 Nov. Up to 20 Colonsay Dec. Breeding/summer: continued evidence of expanding breeding population, breeding proved Colonsay for the first time where perhaps 3 prs attempted. Summer population Tiree possibly 20-25 prs., 2 nests located and 14 ads.+5 juvs. L. Gott 10 Jun. 7 Treshnish Isles 18 Jun.

0163 SNOW GOOSE *Anser caerulescens*

A small feral flock (both blue and white phases) present on Mull, may move to Coll in Autumn.

Single, white phase Lesser, The Oa, Islay 23 Oct. No records from Mull but 42 Breachacha (Coll) 8 Apr.

0166 CANADA GOOSE *Branta canadensis*

B.W. & V. Chiefly Islay, Kintyre and Mid Argyll. Resident population on Colonsay.

See Tables.

Pr. bred Inverary. On Colonsay full clutches 13 Apr. good nos. young Jun. Min. 41 birds mid Nov. 2 Cuil Bay 25 Aug.

single *Hutchinsii* type 19 Mar. and single *Canadensis* type from 20 Oct to 10 Dec. L. Gruinart reserve (RSPB.)



0167 BARNACLE GOOSE *Branta leucopsis*

W. except Cowal. Very large nos. Greenland race winter in Islay.

See Tables.

Counts: 1 Holy Loch 4 Feb., 250-300 Colonsay/Oronsay winter, last recorded Oronsay 16 May, 250 Crossapol Coll 8-19 Apr. 3 wintering flocks Mull, max. 120 Ulva ferry/Inch Kenneth 9 Apr. 2 Tayinloan 15 Apr. 6 "summered" in Tayinloan area.

Autumn records from 30 Sep. with 15+ Tayinloan, 100 Arinagour Coll, 11 Nov. 1 Holy Loch 9 Dec. 77 Fiddien, Mull 23 Dec. and 573 Tiree 31 Dec. A bird, dead, Oronsay 5 Mar. ringed E. Greenland 25 Jul 1985.

0168 BRENT GOOSE *Branta bernicla*

W. & P. Islay, Mull & Mid Argyll.

Majority seen in Argyll are the Light-bellied Brent (*B.b.hrota*) breeding in N.E. Greenland & Queen Elizabeth Islands of Arctic Canada. Main wintering grounds are in Ireland. The Dark-bellied Brent (*B.B. bernicla*) from Arctic Russia is much less often recorded. All records of Brents, please.

See Tables.

All records are of Pale-bellied Brent unless otherwise stated. One amongst 70 Greylags Crinan 28 Feb., 40 L. Gilp 28 Apr. 1 Ardmucknish Bay 5 May, 2 Port Bharrapol Tiree 13 May, 3 L. Cuin 11 Aug. 4 Machrihanish 8 Sep., 8 Tayinloan-Gigha 30 Sep. 2 L. Gruinart Islay, 7 Sep. 113 on 16 Oct. and 9 on 18 Oct., 22 Oronsay 9 Oct. (including one with yellow ring on rt. leg ringed in NE. Canada), 11 Pennygown Mull 14 Oct. and 6 Dark-bellied Oronsay 4 Oct.

3 birds summered and moulted Islay.

0173 SHELDUCK *Tadorna tadorna*

B. & W. Widespread breeding species in suitable areas. Majority leave late Jul. return during Nov.

See Table 1.

Single found dead Gigha 25 May had been ringed Teesmouth 2 Dec. 1983. c.20 Craignish 3 Jan., max. 62 Lochdon, Mull, Mar.; max. 235 L. Gruinart, Islay 14 Apr., c.85 Colonsay Spring (increase over 1985). Good breeding season reported from Gigha., 4 ad. 4 young Coll, Jul. Est. 25 breeding prs. Mull. 3 prs. bred L. Gruinart reserve. Prs. reported from several areas but no details of breeding. First back after moult 15 Nov., 25 inland & coast count Tiree 31 Dec.

0179 WIGEON *Anas penelope*

B. & W. Scarce or irregular breeding species, very common winter visitor.

See Tables.

Counts: 118 Kilninver 25 Jan., max. winter/spring 309 L. Gruinart reserve 14 Apr. 2(M) L. Tulla 2 Jun. First returning birds Autumn: 9 Ardmucknish Bay 3 Sep., c.30 L. Gruinart 14 Sep., c.200 L. Sween 5 Oct., c.100 Blairmore, Dunoon 17 Oct., 40 Benderloch 19 Oct. several flocks of c.60 Benderloch/L. Etive, Oct/Nov., Max. Autumn count L. Gruinart 303 on 15 Nov., c.100 Gigha 12 Dec., 70+ Taynish NNR Dec., Max. winter count Lochdon 291 in Dec., 68 inland and 227 around coast Tiree 31 Dec.

0182 GADWALL *Anas strepera*

W. P. ?B. Irregular, pos. breeding some years.

Pr. Glen Lonan 26 Mar., & 7 there 2 Nov. Pr. Port Lobh 15 Apr. and pr. on sea water pool Tiree 11 May, and (F) with 10 ducklings (2/2 grown) L. Bhassapol is the first confirmed breeding record in Argyll in recent years.

0184 TEAL *Anas crecca*

B. & W. Widespread.

See Tables.

Counts: 40 Benderloch 31 Jan., 4 prs. Glen Lonan 26 Mar., Breeding season: 6 prs. bred L. Gruinart, Islay; a min. of 2 prs. bred Colonsay where 15 present on W.L. Fada 15 Jun. Autumn/winter counts: 25 L. Sween 5 Oct., max. 168 Lochdon, Mull Nov. 55, L. Laich 31 Oct., max 420

L. Gruinart reserve 15 Nov. c.180 Gigha 22 Dec.; min. 120+ Colonsay/Oronsay survey Oct-
Dec. A survey revealed 224 inland and 215 around coast Tiree 31 Dec.

GREEN-WINGED TEAL *A.c. carolinensis*

No records 1986

0186 MALLARD *Anas platyrhynchos*

B. & W. Common breeding and very common wintering species.

See Tables.

Significant counts: 43 Lochdon, Mull 6 Mar. 257 L. Gruinart reserve 8 Sep. (11 prs. bred there). 100+ Colonsay Dec., 139 inland and 138 around coast Tiree 31 Dec.

0189 PINTAIL *Anas acuta*

? B. & W. except N. Argyll and Kintyre.

See Tables.

8 L. a' Phuill, Tiree 3 Jan., 5 Holy Loch 11 Feb., 15 Bridgend Flats Islay 15 Feb., 4 L. Indaal Islay 16 Mar., 1 (M) Port Mhor Colonsay 2, & 17 May. Breeding: at least 4 ads. were on Tiree in May (where 2 prs. bred 1985) and there is strong evidence that one pr. bred successfully. A group of 8 on 5 Jul. were probably a F. with an almost fledged brood. The only autumn records were from Islay with a max. 11 L. Gruinart Sep.-Dec and 3 Bowmore 7 Oct.

0192 BLUE-winged teal *Anas discors*

V.

Pr. (M. & F.) (GC) Tiree 26 May-3 Jun. Subject BBRC.

0194 SHOVELER *Anas clypeata*

B. W. & P. Most wintering birds on Islay.

Majority records as usual from Islay, 3 L. Gruinart 25 Jan. Pr. Bridgend 15 Apr., 1 L. Gruinart 8 Sep., 3 Bowmore 7 Oct., 2 shot on Gigha Dec. Breeding: 9-12 F. confirmed with broods on Tiree is a considerable increase, well above other recent figures.

0198 POCHARD *Aythya ferina*

B. & W. Very scarce breeding species and wintering flocks small.

116 Tiree 1-3 Jan., 11 L. Ba, Mull 3 Jan., 8 L. nan Drinnmean, Kilmelford, 7 Jan., 15 L. Leathan 31 Jan., 2 L. Seil 19 Jan., On Mull, 4 L. Poit and 36 L. Assapol 24 Jan. Max. 28 (24M) Lochan Tainish Jan-Apr., 1 L. Fada, Colonsay 8 Apr., 9 L. Turroman Colonsay 8 Apr. 2(M) L. Tainish Jul., 3 L. Finlaggan, Islay 20 Sep., 10-15 Colonsay Oct., 12 L. Seil 18 Dec., 1 L. Ederline 22 Dec., 10 L. Torr, Mull 24 Dec., 22 L. Restil 18 Dec. 11 (M) L. Tainish Dec.

0200 RING-NECKED DUCK *Aythya collaris*

V.

No records 1986

0203 TUFTED DUCK *Aythya fuligula*

N. & W. Absent from some islands except as non breeders. 12 L. Seil 19 Jan., 11 L. Assapol, Mull 22 Feb., max. 5 L. Tainish Jan-Feb. On Colonsay: 2 L. Fada and 9 L. Turroman 8 Apr., 16 Lochan Dhub Dunbeg 7 Mar., 3 L. Awe 3 May. F. with brood 3 Lochan nan Creardach 10 Aug. 8 broods seen Tiree. Prs. present L. Turroman & East L. Fada 13 Jun., one pr. with 6 ducklings seen Colonsay, 1 (F) L. Tainish Jul., 15 L. Leathan 19 Sep., 3 L. Gruinart Islay 19 Oct., 20 Gigha 12 Dec., 12 L. Leathan 27 Dec., 30(S) Connel 31 Dec.

0204 SCAUP *Aythya marila*

W. & P. Largest wintering flock off Bowmore.

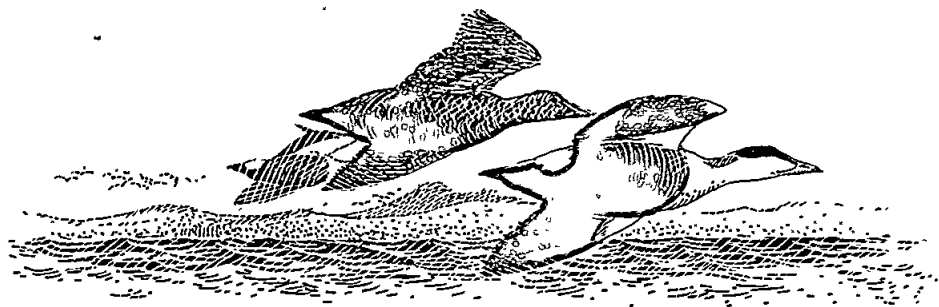
4 (2 imm.M and 2 F) L. Gilp 1 Jan. and 3 (1 imm.M and 2 F) 22 Feb., 800+ L. Indaal 16 Mar., pr. L. Etive 10 Apr., 6 Black Rocks Islay 15 Sep., 80 L. Indaal 21 Oct., 1 L. Gruinart Islay 31 Oct. and 1 L. Torr, Mull 20 Nov.

0206 EIDER *Somateria mollissima*

B. W. & P.

See Tables.

Flocks of 12-55 recorded from many areas, other larger counts include 225 (140 M) 85 (F). L. Riddon 24 Mar. Incomplete counts Colonsay 149 in Apr. and 330 in May, c.491 (294M, 35 imm. 120F. and 42 unsexed) Tiree 12-14 May included large no. of birds, mainly males, on fresh water which is unusual in Argyll. This count will have missed incubating females. First brood recorded L. Etive 11 Jun. 20-40 broods recorded Tiree Jul. 300 L. Long 17 Aug. 122 L. na Keal Mull 20 Aug., 60 Ardmucknish Bay 25 Sep., 95 Oban Bay 31 Dec., and 335 around Tiree coast 31 Dec.



PSMD 85

Eider Duck.

0212 LONG-TAILED DUCK *Clangula hyemalis*

W. & P. Uncommon winter visitor.

See Tables:

2(F) Balephetrish Tiree 3 Jan., Single West Oronsay 5 Jan. & 5 Apr., 1 Holy Loch 1 Feb., 5 Crossapol (Coll) 8 Apr., 6 L. Indaal Islay 26 Oct., 6 Sound of Gigha 20 Dec., 3 (M), L. Coalisport 22 Dec. 19+ around coast Tiree 31 Dec.

0213 COMMON SCOTER *Melanitta nigra*

B. & W. Scarce winter visitor and very rare breeding species.

100+ L. Indaal mostly (M), 16 Mar., 4 L. Indaal 6 Jun., 10(S) Rubha Aird Alanais, Tiree 19 Jun. Present at one potential breeding site Islay, max count 18 (8M, 7F and 3 unsexed) 23 Jun.; 3 L. Gruinart 29 Jul., 1 Salen Mull, Jun., 75 Baugh Bay Tiree 4 Aug.; on Colonsay 1(M) Kiloran Bay 29 Oct., and 2 (F) Plaid Mor 16 Nov., 2(M) L. Caolisport 22 Dec., 3 Sound of Gigha 22 Dec.

0214 SURF SCOTER *Melanitta perspicillata*

V. No records 1986

0215 VELVET SCOTER *Melanitta fusca*

W. Chiefly Kintyre, Islay and mid Argyll. Very scarce.

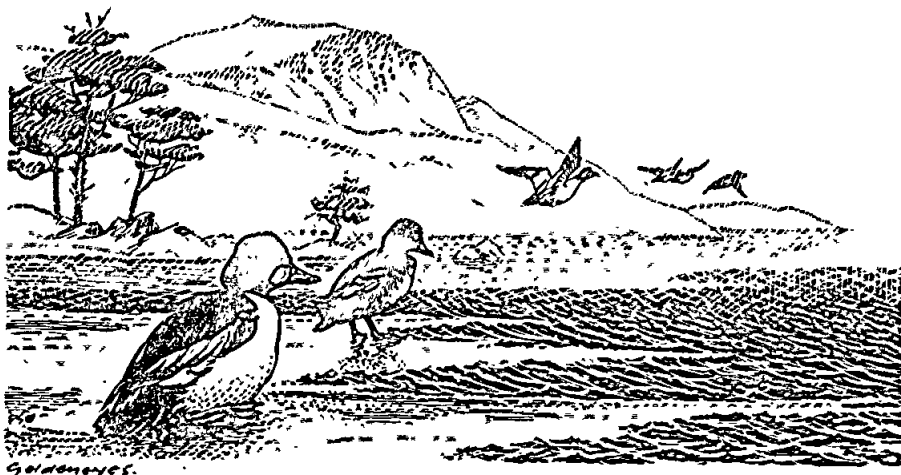
4 L. Etive 11 Feb. Singles (M), Sound of Gigha 2 Mar., L. Tuath Nov. and 2 off Gunna 13 Nov. Single L. na Keal, Mull 9 Dec.

0218 GOLDENEYE *Bucephala clangula*

W. Common. Some stay to end May, display from Feb. onwards. Recently nestboxes have been provided in suitable sites by the RSPB and the Forestry Commission and more are planned.

See Tables.

Widely reported (many counts 3-8) all months except Jul/Aug. 3 moulting males Cairnbaan 28 Jun. Counts in excess of ten: 41 Tiree 1-3 Jan., 15 L. Creran 2 Feb., 16 L. Etive 23 Mar., 11 Mishnish Lochs Mull 1 Apr., 16 L. Feochan 3 Apr., max 24 L. Gruinart Jan-Apr., 13 L. Spelve, Mull 14. Nov., and max. 5 L. Gruinart Oct.



0220 SMEW *Mergus albellus*

W. Very rare winter visitor.

See Tables:

Single (F), L. Indaal 15 Nov.

0221 RED-BREASTED MERGANSER *Mergus serrator*

B. & W. Common. Large moulting flocks may be seen in summer.

See Tables.

Widely reported. Significant counts: 25 L. Etive 17 Jan., 100 Ardrishaig 5 Feb., 200 moulting males L. Indaal 1 Aug. On Mull 24 Scallastle Bay and 36 Fishnish Bay 20 Aug. Present thro year L. Gruinart max. 103 Sep., 200 Machrihanish Bay 9 Sep., 75 Duart Bay Mull 12 Sep., 52 Black Rocks Islay 15 Sep., 50 Ardmucknish Bay 25 Sep., 46 E. & S. Oronsay 9 Oct., 41 around coast and 30 inland Tiree 31 Dec.

0223 GOOSANDER *Mergus merganser*

B. & W. Scarce breeding species.

Small nos (2-4) on larger rivers and at river mouths into lochs. 6 L. Ederline Feb. 5, Fishnish Lochs 6 Mar. and 6 there 1 Apr. Birds reported from Rivers Awe, Nant, Orchy. Single R. Eachaig 19 May. No evidence of breeding on Mull. F. with brood of 12 small ducklings L. Awe 11 Jun. Single L. Gruinart 22 Oct (new for reserve) 5 R. Forsa Mull, 16 Dec.

0225 RUDDY DUCK *Oxyura jamaicensis*

No records 1986.

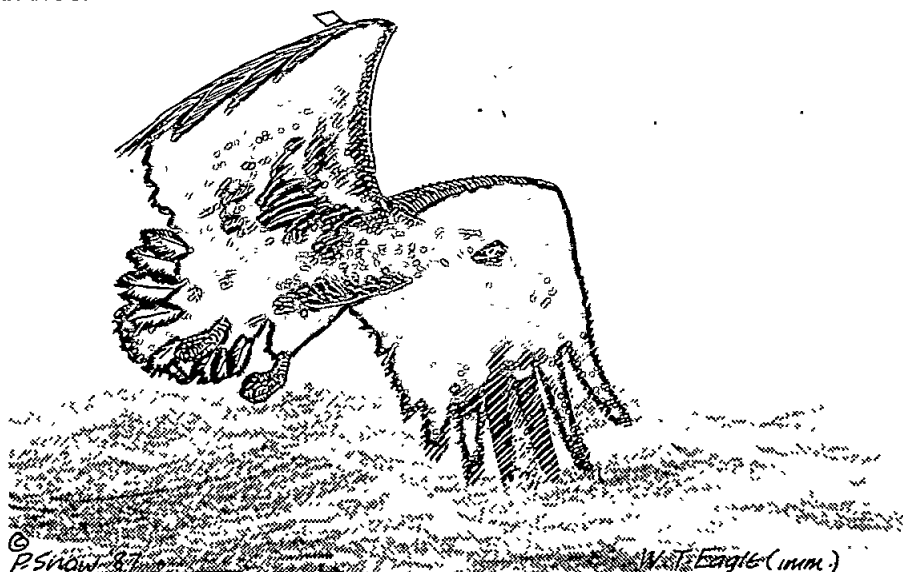
0239 RED KITE *Milvus milvus*
V.

The record of Nov. 1985 has been accepted by SBRC. No records 1986.

0243 WHITE-TAILED EAGLE *Haliaeetus albicilla*

SCOTLAND One pr. successfully reared 2 young. This was the second year in succession that successful breeding occurred in the wild. The parents had originally been released on Rhum as part of a re-introduction programme by the NCC. Several other pairs have become established and are being monitored by the RSPB and the NCC. The locations of these established pairs are being withheld in the interests of the birds.

Since 1982 juveniles released from Rhum have been fitted with coloured wing tags. (1982 Orange, 1983 Yellow, 1984 White, 1985 Blue). These tags are numbered and the numbers can be read at a modest range with a telescope. Birds from this project have been recorded throughout western Argyll. Records are requested for all sighting and will be forwarded to the RSPB & the NCC.



Single North end of Islay 1 Jul. (SA)

0260 MARSH HARRIER *Circus aeruginosus*
V.

Single. (F). E. L. Fada Colonsay 18 Jun. (M.H) and single Foreland Islay (S.P) early Jun. (same bird?)

0261 HEN HARRIER *Circus cyaneus*

B. & W. Sparse but widespread. Some Autumn movements.

Majority of records Oct/Nov. More records than usual from mainland but fewer birds recorded Autumn/early Winter on Mull than previously. Winter roosts: 2 roost areas located L. Gruinart, Islay; roost S. Mull held max. 8 on 9 Feb; roost S. Argyll mainland used Jan/Mar and Oct/Dec. held max. 12 in Feb. and Nov. Breeding data: 4 breeding sites monitored Mull had poor success; only one successful fledging 3 young, one hatched 3 young which subsequently died, and 2 failed to produce young. One M. bred with 2 F., L. Gruinart Islay. In one area of mid Argyll a

very successful breeding season with 4 successful nests within a relatively small area. Other records and counts; single Taynish NNR Jan, 3 (M.+2 Ringtail) Glen More Mull 24 Mar., max. 8 seen L. Gruinart reserve Islay 2 May, singles Mealdarroch Jun and Taynish NNR Aug., 3 records Tiree.

0267 GOSHAWK *Accipiter gentilis*
V.

Six records. Singles mid Argyll 13 Feb., L. Gruinart 25 Feb. & 15 Nov., Taynish NNR. May. Ardmeanach, Mull 15 Jun., Lochdon 29 Aug.

0269 SPARROW HAWK *Accipiter nisus*

B. W. & P. Widespread but secretive, probably under recorded.

Singles recorded through yr. from Mid. & N. Argyll, Kintyre, Islay and at least 2 prs Gigha. Not breeding L. Gruinart but present thro yr., (max 3 in Aug.). Present thro' yr. Colonsay. Taynish NNR. thro yr.

0287 BUZZARD *Buteo buteo*

B. & W. The most abundant raptor in Argyll.

2-3 prs present Gigha, 2 prs bred Connel area, substantially fewer young produced Mull than in 1985. Uncommon Tiree, est. population 6 birds, breeding confirmed at one site only (A low vegetated wall in an open situation). 7 seen on Coll incl. 1 young, 2-3 prs. Colonsay and many singles. One badly injured at Golden eagle site, Mull, 9 Apr. Present thro' yr. Dunoon, and "abundant" Kintyre. Max 6 L. Gruinart Feb. Pr. Geometra 8 Aug.

0296 GOLDEN EAGLE *Aquila chrysaetos*

B. & W. Immatures tend to wander during Autumn & winter and may be recorded in areas where breeding does not occur.

Other than the breeding reports over 15 records received including one of 14 sightings from Islay. Most records are of single birds, but 3 in Cowal 16 Aug. A dead adult, Calliach Point, Mull 23 Feb.

Reports from a long standing study area in Argyll showed that 26 prs. were checked, 11 prs. laid eggs, 6 prs. hatched, and 5 prs. reared 5 young. A low no. of prs. bred this year but out of the prs. which laid eggs the success rate was average (MG.AGG.). Elsewhere in the County 34 home ranges were visited, of these 26-30 were occupied by prs. and there were single birds at three others. Only six prs. were successful, raising one chick each. The cold wet weather in the early Spring is thought to have been the main reason for such poor success. Some regular prs. probably did not even lay eggs. RSPB.

0301 OSPREY *Pandion haliaetus*
P.

Singles L. Ballygrant Islay 28 May, L. Linnhe 7 Aug., Crinan 9 Sep., Glen Aray Jul.



0304 KESTREL *Falco tinnunculus*

B. W. & P. May be under recorded.

Autumn increase due to passage thro County. From Islay a report "not all that common" and said to be "infrequent" Dunoon area, 2-3 prs Gigha and present thro' yr. Pr. Ganavan 1 Jul. Present L. Gruinart (max. 3) except Jun. & Aug. Birds have been located at 22 sites in Mull over the last 3 years, mostly N & W of island. Only one record, Tiree, Jul. Pr. + F. on Coll, Jun. Singles reported widely elsewhere.

0309 MERLIN *Falco columbarius*

B. W. & P. Scarce and declining as a breeding species.

Successful breeding reported from Islay (3 young). In N. Argyll 3 breeding prs. were monitored, 2 were successful but the outcome at the third site is not known. Breeding was proved at one site in Mull and 1-2 birds were present in a number of suitable breeding sites. A pr. was present and breeding on Coll and Colonsay respectively. RSPB.

Singles Dervaig Mull 22 Mar. 1(M) killed a Blue Tit, Tiroran Mull 24 Mar., Singles Oronsay 4 & 11 Apr., Danna Island 8 Apr., Salen 21 Jun., Saligo 16 Sep., 2 Machrihanish area 10 Sep., Singles; Gigha 4 Oct., Buessan, Mull, 9 Oct., Foreland Islay, 17 Oct., max 2 L. Gruinart Islay several months. Scarce on Tiree, 3 records, Jan., May and Oct.

0318 GYR FALCON *Falco rusticolus*

V.

A single record 1 (?F), dark phase, L. Speive 13 Jun. (MM.JF.) (subject to BBRC).

0320 PEREGRINE FALCON *Falco peregrinus*

B. W. & P. Widespread but scarce.

Over 25 reports, other than breeding records from all areas chiefly of single birds. Single roosted with Ravens, Tobermory Mull, Feb.

The breeding information is limited and rather patchy but it indicates a poor season, particularly in the islands, the west coast and in the NW of the County. Here some prs. did not attempt to breed during the persistently wet Spring. Of the 10 prs. where the outcome is certain, only 4 were successful and 2 was the largest brood recorded. In Cowal and the eastern part of the County the breeding success seems to have been higher and whilst no systematic monitoring was carried out at least 7 successful prs. were located. RSPB.

0329 RED GROUSE *Lagopus lagopus*

R. Locally distributed.

Bred Coultorsay. Max 5 L. Gruinart reserve Jul. Low nos. reported from L. Sween area. Uncommon Mull, ad+ b./2 Salen 25 Jul, and ad.+b/1 Calgary 19 Jun.

0330 PTARMIGAN *Lagopus mutus*

Local on hills, generally above 2,400 asl. Under recorded. All records in future please.

Pr. Bein Sgualird N. Argyll, 3 Jun. Scarce Mull with small populations on at least three summits.

0332 BLACK GROUSE *Tetrao tetrix*

R.

3 Cnoc Moy Kintyre, 20 Aug., 6 Glen Feochan 6 Nov. 4(M), (2F) N. Mealdarroch Nov. Present L. Gruinart reserve Islay, Feb-Sep. (except Jul.) but not breeding.

0358 RED-LEGGED PARTRIDGE *Alectoris rufa*

Birds introduced S. Mull 1985.

0367 GREY PATRIDGE *Perdix perdix*

Status uncertain.

No records 1986.

0370 **QUAIL** *Coturnix coturnix*

V. Rare.

No records since 1982.

0394 **PHEASANT** *Phasianus colchicus*

R.

Both Ring-necked & Old English types recorded from Colonsay. c.19 prs. bred L. Gruinart reserve. Introduced Tíree 1985.

0396 **GOLDEN PHEASANT** *Chrysolophus pictus*

A small feral population exists at the head of L. na Keal, Mull.

0407 **WATER RAIL** *Rallus aquaticus*

B(?). W. & P. in Islay, Mull & N. Argyll. May be under recorded.

Birds heard calling, two locations, Colonsay, during breeding season. Tíree, single record, Cornabeg 31 Dec.

0408 **SPOTTED CRAKE** *Porzana porzana*

Very rare summer visitor.

No records since 1982.

0421 **CORNCRAKE** *Crex crex*

S.

Present 2 sites Gigha (definite breeding one site). 5 calling birds heard Colonsay early May but only 2 calling later in summer. Calling birds heard at 5 locations Coll, Jul. and at 8 sites Tíree 24 May-7 Jun. but full systematic census not attempted on either island. Survey on Islay revealed 23 probably breeding territories. See article by P. Moore in this Report. Other calling birds heard Iona 31 Jul., Pennyghael Mull and Southend 15-25 Jul. One found dead Tarbert golf course 16 Jun and a single Tighnabruaich early Oct.

0424 **MOORHEN** *Gallinula chloropus*

B. & W. Scarce.

Recorded from Islay including max. 17 L. Gruinart reserve Jan., (3 prs bred there), 1-2 prs Colonsay but no reported breeding. Single Aros Park Mull, Dec. On Tíree 5 Cornabeg 3 Jan., and 1 pr. confirmed breeding. Resident Machrihanish airstrip ditches, with max. 3.

0429 **COOT** *Fulica atra*

B. & W. Uncommon.

Resident Islay on Lochs Ballygrant, Finlaggan, and Skerrols. Counts: 15 Tíree 16-17 Jan., 2 L. Seil 19 Jan., 2 Balgowan, Lismore and 2 L. Kilmichael 20 Feb., 2 Lismore 21 Apr., 2 Ford Jan-Mar., and one May, 2 Mill Loch, Gigha, 22 Dec. and 11 Tíree 31 Dec.

0433 **CRANE** *Grus grus*

V.

Single Ballinaby, N.W. Islay 13-25 May (PM.GJ.) subject acceptance BBRC.

0450 **OYSTERCATCHER** *Haematopus ostralegus*

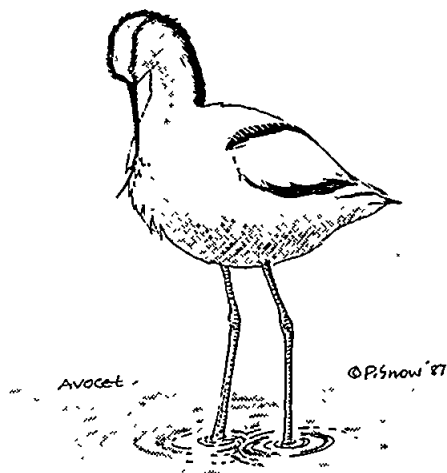
B. W. & P. Common.

See Tables.

Incomplete counts of 157 Colonsay Apr., and 131 breeding prs. and c. 150 non breeders, late May. 1012 around coast Tíree 10-13 May, 91 Lochdon Mull, Aug., 75 Ledaig Point 25 Aug., 16 prs. bred L. Gruinart reserve. Bred Treshnish Isles. 92 L. na Keal Mull, 14 Dec.

0456 AVOCET *Recurvirostra avosetta*
V.

Single record: 1 Brunerican Bay, Kintyre, 15 May, (LM) this appears to be the first record for many years for the County.



0470 RINGED PLOVER *Charadrius hiaticula*

B. W. & P. Common, widespread.

See Tables.

34 W. Oronsay 6 Apr., 485 around coast Tiree 10-14 May, 12 Airds Bay 17 Jul., c.35 Ledaig Point 5 Aug. 250 (part count) Colonsay 23-24 Oct. 5 prs. bred L. Gruinart reserve, 46 prs. Colonsay late May. Bred Treshnish Isles, & Coll, 32 Lochdon Mull, Sep., 40 Pennygown Mull, 11 Dec.

0482 DOTTEREL *Charadrius morinellus*

Status uncertain.

No records 1984, 85 and 86. All records please.

0485 GOLDEN PLOVER *Pluvialis apricaria*

B. W. & P.

See Tables:

4 Oronsay airfield 4 Apr., 18 Knockantivore 8 Apr., 350 Tiree 8-10 Apr. 3 (Northern race) Duart, Mull, 4 May, 5 Colonsay Oct.

0486 GREY PLOVER *Pluvialis squatarola*

P. & W. most areas. Uncommon passage migrant. May be under recorded.

See Tables:

6 Traigh nan Barc, Colonsay 2 Jan., single with Lapwing Dunoon 22 Feb. 4 Lochdon, Mull 6 Mar., and 3 on 25 Mar. Singles E. & W. Oronsay 9 Apr., 3 Coll 8 Apr., 2 Caoles Tiree 10-14 May, 4 Lochdon Mull, 6 Mar., 3 on 25 Mar. Single Lochdon, Mull 15 Sep.

0493 LAPWING *Vanellus vanellus*

B. W. P. Widespread breeding & wintering species. Some areas deserted after breeding. Hard weather movements in winter.

See Tables.

7 Dunoon Feb., 55 Connel 9 Mar., 14 Lochdon Mull 29 Mar., 20 Fidden, Mull 16 Apr., 14 Ledaig Point 14 Nov., 560 Colonsay Nov., 400+ there Dec. Bred Ardskenish, Benderloch, Connel, Gigha, Mull, 23-28 prs est. breeding Coll; widespread breeding Tiree, 121 prs. bred L. Gruinart reserve. 140 prs. Colonsay late May. Probably bred Treshnish Isles.

0496 KNOT *Calidris canutus*

P. & W. all areas except Cowal. Chiefly seen as Autumn migrant.

See Tables:

2 Lochdon Mull, 6 Mar., 2 L. Gruinart reserve 10 Mar., 5 (S. Plumage) Ledaig Point 5 Aug. and 2 on 3 Sep., 3 Lochdon, Mull on 29 Aug., 4 S. off Lismore 22 Aug. Passage L. Gruinart reserve 4 Aug-31 Oct. (max. 150 on 28 Oct.) 10 Machrihanish Bay 9 Sep., 4 Campbeltown Loch 9 Sep. 6 around coast Tiree 31 Dec.

0497 SANDERLING *Calidris alba*

P. & W. all areas except Cowal. Chiefly passage migrant, occasional summering birds.

See Tables:

Single: Strand Colonsay, 11 May, 172 around coast Tiree 10-14 May (some almost in S. Plumage), 6 Laggan Bay, Islay 22 Jun. Single Traig an Luig, Islay 15 Sep.

0501 LITTLE STINT *Calidris minuta*

V.

Single L. Gruinart reserve 8 Sep., and 3 there on 10 Sep. 2 Gigha 12 Dec.

0507 PECTORAL SANDPIPER *Calidris melanotos*

V.

The record of 9 Sep. 1985 Mull has been accepted by SBRC.

0510 PURPLE SANDPIPER *Calidris maritima*

W. & P. all suitable areas.

See Tables:

Winter present Dunoon. Small winter pop. Caliach Point, Mull, 10 Ledaig Point Feb. Up to 16 in Spring Colonsay. 155 (mostly S. Plumage), Tiree 10-14 May, 26 S. & E. Oronsay 14 Dec.

0512 DUNLIN *Calidris alpina*

B. W. & P. all areas, generally small nos. winter.

See Tables.

78 (max. count) Lochdon, Mull, early May, and 48 there Jan., 20 during Jan. Feb. Ledaig Point, 5 Dunstaffnage Bay 7 Mar. Part count 49 Colonsay late May, 5 Port Lobh 1 Jun., 56 Oronsay 2 Jul., 1238, (all S. Plumage) around coast Tiree 10-14 May.

0517 RUFF *Philomachus pugnax*

P. Irregular.

Single Lochdon, Mull 12 Aug. Singles L. Gruinart reserve 8-26 Sep., and Machrihanish air-strip, Kintyre, 8 Sep.

0518 JACK SNIFE *Lymnocyrtus minimus*

W. & P. Islay, mid Argyll, Mull, Gigha. Probably under recorded.

Present L. Gruinart reserve Jan-Apr & Oct. (max. 2 Mar. & Oct.) 2 L. Indall 6 Feb., 2 Portnahaven 24 Feb., single Tiree 8 Apr., and Tibertich, Kintyre, 11 Sep.

0519 SNIFE *Gallinago gallinago*

B. W. & P. Widespread, locally common.

See Tables:

5 prs, drumming Oronsay 5 Apr., "a few prs" reported from Gigha. Single Staffa 18 Jun., c. 60

prs. probably bred L. Gruinart reserve. Numbers there much lower in winter. 26 prs. (part count) Colonsay late May. Fewer reports of displaying birds in Mull this year. Many feeding along shoreline Tiree in winter.

0527 LONG-BILLED DOWITCHER *Limnodromus scolopaceus*
V.

Single Islay Airstrip 18-20 Jun (RE, PE, MAO, GJ et. al.) Subject to BBRC.

0529 WOODCOCK *Scolopax rusticola*

B. P. & W.

4 around coast Tiree Jan., 4 Connel 27 Feb., Bred Mealdarroch, 6 prs (part count) Colonsay late May. 12 in small wood Salen 13 Jul., Present Taynish NNR. Jan-Apr. (8 max. in one day). Regular L. Gruinart reserve Jan-Apr. (max. 5) Single there in Jun., and 2 thro Oct.

0532 BLACK-TAILED GODWIT *Limosa limosa*

P. Irregular & scarce. May be under recorded.

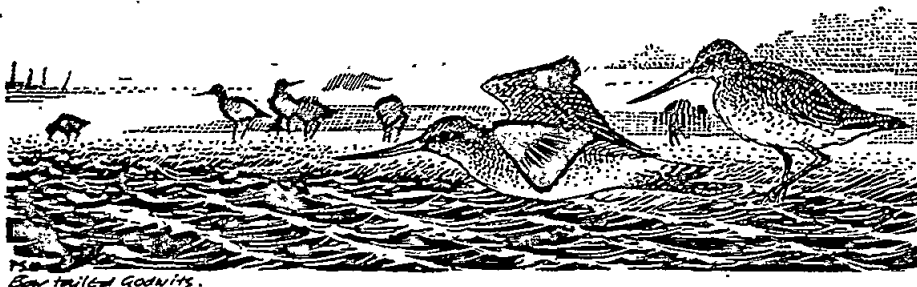
Singles Aird's Bay 28 Apr. Lochdon, Mull, 3-5 May, and L. Gruinart reserve 24-30 Sep., 4 L. Righain, Tiree, 5 Jul.

0533 BAR-TAILED GODWIT *Limosa lapponica*

P. & W. Only a few winter away from Tiree and Islay.

See Tables.

7 Strand 2 Jan., single Holy Loch 1 Feb., 7 Lochdon, Mull, 4 May, 6 L. Gilp 13 Mar. Thro yr. L. Gruinart reserve, (with max. 62 in Mar), 31 Gott Bay 10-14 May.



Black-tailed Godwits.

0538 WHIMBREL *Numenius phaeopus*

P. Most seen in May.

See Table 2.

First 25 Coultorsay 20 Apr. Passage Mull early May, 4 Lochbuie 3 May, frequent sightings Colonsay thro May (1-5 birds), 5 Coultorsay 11 May, other records from Islay May-Jun. Present Crinan Moss May, 29 Tiree 10-14 May. Singles Taynuilt 12 May, Colonsay 1 Jun., 2 Coll 5 Jul. Present L. Gruinart reserve May-Oct. with max 10 in Jun., 8 Lochdon 15 Aug., single Craignure 15 Sep.

0541 CURLEW *Numenius arquata*

B.W. & P.

See Tables.

51 Lochdon Jan., 8 Port na Luigne 7 Apr., c.20 Colonsay May/Jun., 81 around coast Tiree 10-14 May, 100 head of Holy Loch 3 Aug., 2-300 around Machrihanish Bay Sep., 20 Benderloch 19 Oct. Part count c. 190 Colonsay, Oct-Dec.

- 0545 SPOTTED REDSHANK *Tringa erythropus*
P. Rare migrant.
Single Lochdon 4 May. (JHJ) First record since 1982.

0546 REDSHANK *Tringa totanus*

B. W. & P.
See Tables.

15 L. Long 27 Apr., 64 Tírce 10-14 May, 15 prs. bred L. Gruinart reserve. 5 prs. & 8 non breeders Colonsay late May. 3+ prs breeding Coll Jul., 14 Aird's Bay 17 Jul., 51 (max. count) Lochdon, Mull, Aug., 30 Benderloch 22 Aug., 27 S. & E. Oronsay Nov-Dec.

0548 GREENSHANK *Tringa nebularia*

B. W. & P. Rare breeder in very small nos.
See Tables:

More records than usual. 2 L. Gilp 1 & 2 Jan. and 28 Feb., 3 Taynish NNR Jan., 4 Aird's Bay 29 Mar., 6 Machrins 10 Apr. Singles Ellister 22 Apr., Eriska 11 Apr., Strand 7 Apr., 4 Aird's Bay 17 Apr., 1 Loch a Phuill 8 Jul., 8 (max. count) Lochdon Mull, Aug., 3 Ulva 17 Jul., 3 Benderloch 7 Aug., 2 on 9 Sep., 4 Strand/Oronsay 15 Nov. Recorded all months except Apr. Oct. and Dec. at L. Gruinart reserve, (max. nos. in Sep. and Feb.) None present this year at previous breeding sites in Mull.

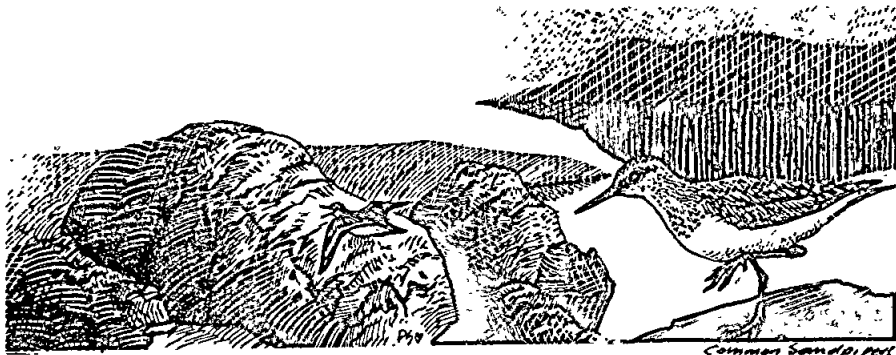
0554 WOOD SANDPIPER *Tringa glareola*

V. Very rare passage migrant.
2 (unconfirmed) L. Gruinart 15 Jun (HRA).

0556 COMMON SANDPIPER *Actitis hypoleucos*

B. W. & P. (occasional winter records)
See Tables:

First Aird's Bay 7 Mar., General arrival 24/25 Apr., Last Aros River, Mull, 21 Aug. Present Mealdarroch Apr.-Jul. 2-3 prs. bred Coultorsay, several prs bred Gigha, 3 prs. Gallanach Jun., 7 prs. bred Connel area Jun./Jul., 25-30 prs. Colonsay. At least 1 pr. thought to be breeding Coll., 20 L. Gruinart reserve Aug.



0561 TURNSTONE *Arenaria interpres*

W. & P.
See Tables:

20 Lochdon, Mull 21 Feb., 120 L. Gruinart reserve Feb. wintering flock c.40 Ledaig Point, 59 E. Oronsay 10 Apr., 20 Sgeir nan Gobhar, 8 Jul., 6 (first return) Ledaig Point 5 Aug., 133 part count S. & E. Oronsay 14 Dec., 30 Pennygown, Mull, 11 Dec., 28 Scallastle, Mull, 14 Dec. Many summer records Tírce, 850 (mostly S. Plumage) around coasts there 10-14 May., 8 Coll 2 Jul.

0565 GREY PHALAROPE *Phalaropus fulicarius*

P. rare migrant.

Single Ballinaby, Islay, 11 Jun. to at least 20th Jun. (GJ.MAO.PM.)

0566 POMARINE SKUA *Stercorarius pomarinus*

P. off W. coast and Islands. Uncommon. May be under recorded.

Single between Tobermory and Coll 2 Jul., 4 ads. off Port Ellen 10 Jul. Singles L. Linnhe 1 Aug. and between Gigha and Islay 14 Nov.

0567 ARCTIC SKUA *Stercorarius parasiticus*

S. & P. (except Cowal). Breeds Jura and Coll.

Regular sightings Colonsay from mid May, irregular L. Gruinart reserve May-Oct none Aug. (max 3 in May). Incomplete census Coll in Jul. produced min. 24 at 2 usual breeding sites. 4 Iona 21 May, single pale phase Gott Bay Tiree 26 May, 3 pale phase Lunga, Treshnish Isles, 15 Jun. Other records from Mull and Tiree. Single Ardmore Point 14 Sep.

0569 GREAT SKUA *Stercorarius skua*

P.

3 off W. Colonsay 16 Apr. singles Rubha nan Gall, Mull 25 May, and off NE. Colonsay 8 Aug., 2 off Frenchman's Rocks 19 Sep., occasional Sound of Gigha. Single L. Gruinart 15 Sep.

0579 SABINE'S GULL *Larus sabini*

V. Rare.

Single off Tiree 24 May, (GC) subject to SBRC.

0682 BLACK-HEADED GULL *Larus ridibundus*

B. & W.

See Tables.

40 W. Oronsay 9 Apr., 60 Oban Harbour 8 Mar. & 28 Dec. max 327 L. Gruinart Apr., 146 at breeding sites Colonsay late May, 506 prs. at 11 sites Tiree, May/Jun. 30 prs. Ardskenish 4 Jun. Breeding confirmed at 2 sites Mull.

0589 RING-BILLED GULL *Larus delawarensis*

V.

Single, first winter, Bridgend 13 Oct. (RS.MC.JH.PH.) This, if accepted by BBRC, will be the third Argyll record.

0590 COMMON GULL *Larus canus*

B. & W. Widespread and common breeding species.

See Tables:

c.350 Ardmucknish Bay 16 Mar., 40 W. Oronsay 8 Apr., 196 at breeding sites Colonsay late May, min. 66 prs. at 7 sites Tiree May/Jun., at least 3 prs. Coll, Jul., 78 nests located Mull (including 22 Lochdon most of these predated and only 3 young fledged from there), 62 Garvellachs 6 Jun. but no evidence of breeding. Max. 425 L. Gruinart reserve Oct.

0591 LESSER-BLACK B. GULL *Larus fuscus*

B. & P. Uncommon winter.

See Tables:

First Connel 15 Mar., Dunoon 12 Apr., 2 W.L. Fada 8 Apr., 82 at breeding sites Colonsay late May, and c.292. prs. at 8 sites Tiree May. Est 15-24 prs. Treshnish Isles Jun. No evidence of breeding Garvellachs. Absent L. Gruinart reserve Feb. Mar. Nov. with 126 in Jun.

0592 HERRING GULL *Larus argentatus*

B. & P. Common breeder with nos increased by birds from Clyde and N.E. England

(evidence from colour ringed birds). All colour ringed reports, please)

See Tables:

120 Kiloran Meadows 8 Apr. Max 570 L. Gruinart reserve Oct., 156 Oban Harbour 29 Dec
2300 birds at breeding sites Colonsay late May. Est. 1482-1513 prs. at 13 sites Tiree Jun., 109-280
nest sites Mull coast line and 302-389 prs. Treshnish Isles. Singles with yellow legs Oban 29 Jan
and Feb. 4 (?same bird) and 5 Jul.

0598 ICELAND GULL *Larus glaucoides*

W. Small nos. most years.

One dead Cuil Bay 26 Jan. Single Crossapol Tiree 1 Jan. Imm. L. Indaal 10-14 Mar. a 3rd yr.
Bridgewater, Islay 16 Mar. Single L. Indaal 15 Apr.

0599 GLAUCOUS GULL *Larus hyperboreus*

W. Small nos. usually more plentiful than Iceland Gull.

One dead 2 yr. old Colonsay 31 May, Singles: Traigh an Luig, Islay 16 Mar., and ad. L. Indaal
Jan-Mar., and 1 yr. birds Bridgend 16 Mar., L. Indaal Jan-Jun, and Dunoon 12 Apr. 1-2 present
L. Indaal Aug-Dec. Ad Oban harbour 17 Dec. and ad. Croggan 15 Dec.

0600 GREAT BLACK BACKED GULL *Larus marinus*

B. & W. Common, widespread.

See Tables:

34 L. Gruinart reserve Jan., 62 prs. Colonsay late May, c.61 prs. at 9 sites Tiree May, at least
1 nest Garvellachs, Jun., 81-105 prs. Treshnish Isles Jun. Single feeding on sheep carcase
Killichronan 6 Mar. dominated 10 Ravens.

0602 KITTIWAKE *Rissa tridactyla*

B. & P. Generally off W. coasts. Breeds mainly Islay, Colonsay, Tiree & Treshnish
Isles.

c.5700 breeding prs. counted end May in Colonsay. 305 nests Treshnish Isles Jun., 794 sites
occupied at Cean a Mhara, Tiree, May and 400 occupied ledges there 8 Jul., 150 Calliach Point
(not breeding) Spring. Other records 32 L. Long 28 Jun. and irregular L. Gruinart Aug-Nov. with
max 7 in Oct.

0604 IVORY GULL *Pagophila eburnea*

V.

Single first winter Oban 17 Jan., (GW.VW.). Second recent record for Argyll (if accepted by
BBRC). First 1969.

0611 SANDWICH TERN *Sterna sandvicensis*

P. Irregular. May be under recorded.

2 E. Bay Dunoon 6 May, 2 Croig 19 Jun., 3 & 4 L. Long 28 Jun. & 27 Aug. respectively.
Singles: Iona 21 May, and off Lismore 22 Jun., 10-20 Machrihanish Bay 8 Sep.

One pr. bred at each of three mixed tern colonies in Argyll.

0615 COMMON TERN *Sterna hirunda*

S. P. & B. Widespread and common.

First L. Etive 9 May. Last (70) Salen Bay 21 Aug. Irregular L. Gruinart May and Aug. (max
20 in Aug.).

Mammalian predators struck 3 largest colonies of 393, 169 & 110 prs. causing chick mortality
of 28, 95 and 100% respectively. Many smaller colonies were destroyed. Otters were the probable
predators. At another colony Buzzard predation on the chicks caused the colony to desert.

0616 ARCTIC TERN *Sterna arctica*

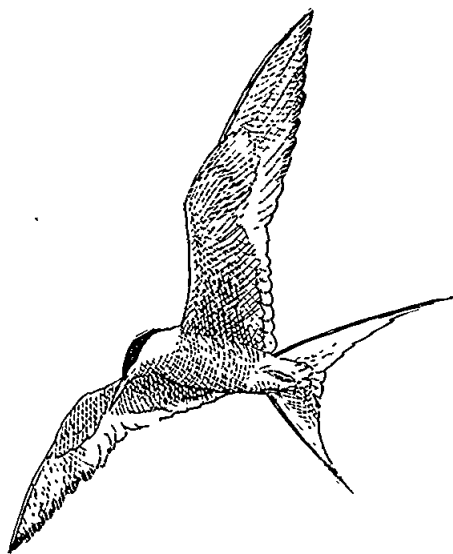
S. B. & P. Widespread and common but as with Common subject to increasing disturbance
due to increased tourist activity.

First L. Etive 9 May. Irregular May-Aug. max 30 L. Gruinart. 100+ with nests Eilean a Chomraig Jun.

The numbers of pairs of breeding Arctic and Common terns monitored in Argyll excluding Col, Tiree, Jura and Colonsay were as follows:

Arctic 299. Common 899 (CC)

(There were also +94-123 prs. Mull which were not monitored and no data on breeding success).



0624 LITTLE TERN *Sterna albifrons*

S. & B. Kintyre, Islay, Coll, Tiree, scarce and future uncertain because of increasing disturbance.

Count: 69 round coast Tiree 10-14 May, 12 Heanish, Tiree, 14 Jun. Est. 12 prs. breeding Coll Jul.

0634 GUILLEMOT *Uria aalge*

B. & W. Main colonies Colonsay and Harp Rock, Lunda and Treshnish Isles.

13,617 counted on ledges Colonsay late May, eggs laid 31 May. Breeding Treshnish Isles, (4737 birds ashore Lunga and 176 elsewhere in the group) Jun. Est. 400 birds ashore Cean a Mhara, Tiree 8 Jul. c.20 head of L. Fynne 18 Dec., 18 dead Cuil Bay Jan/Feb., 19 dead Connel Bridge-Tralee Beach Jan/Feb.

0636 RAZORBILL *Alca torda*

B. & W. (except Cowal).

10 Colonsay 9 Apr. 1440 birds on breeding ledges there late May. c.170 birds and 100-150 sites occupied Cean a Mhara 8 Jul., 202-302 sites Treshnish Isles 15 Jun.

0638 BLACK GUILLEMOT *Cepphus grylle*

B. & W. Breeds in low density around most coasts.

23+ off Malcolms Point, Mull 5 May. 101 seen around coasts of Colonsay late May. 41 Treshnish Isles 15 Jun.

0647 LITTLE AUK *Alle alle*

W. Irregular, usually after severe winter gales.

Single Aird's Bay 25 Mar. Single "rescued" Obay Bay 23 Oct. later died.

0654 PUFFIN *Fratercula arctica*

B. & P. Kintyre, Islay and Mull. Scarce away from main colonies except on passage. Largest Argyll colony is on Treshnish Isles. 850 close inshore Lunga, Treshnish Isles, Jun., 3 prs. prob. bred Mull coast. Singles (dead) Colonsay 15 Jun and Oronsay 26 Dec.



① Jackdaw ② Raven & crow ③ Herring gull
④ Puffin ⑤ Cormorant ⑥ Razorbill

0665 ROCK DOVE *Columba livia*

R. & W. Except Cowal.

75 Fiddien, Mull 21 Feb., 40+ L. Gorm, Islay 16 Mar., 87 Oronsay Priory field 5 Apr., 1 killed by Hoodie Scalasaig, Colonsay 31 May. Present L. Gruinart reserve thro' yr., (1 pr. bred). Max. 42 Tiree, May-Jun., 20 Pennygown, Mull 9 Nov. 5 Keils 26 Dec., c.100 Kintyre (including 60 Gigha) 22 Dec.

0668 STOCK DOVE *Columba oenas*

Status uncertain.

Three records, 1 Slochavullin, mid Argyll, 6 May, 1 Kilberry Knapdale 19 Jun., 1 Kiloran Dunes (Colonsay) 15-19 May.

0607 WOOD PIGEON *Columba palumbus*

B. & W. Common breeding species. Uncommon Mull, absent Tiree & Coll.

c. 3 prs. Colonsay Wood 17 Jun., c.50 Colonsay Sep/Oct. 4 prs. bred L. Gruinart Reserve, 3 Garvellachs Isles 6 Jun.

0684 COLLARED DOVE *Streptopelia decaocta*

B. & P. Common. Scarce Tiree.

Reported from 6 localities mid Argyll. Reports also from Dunoon area and from Colonsay, 2

prs. nested Gigha, 3 prs. bred L. Gruinart, c.30 birds present around Connel May-Jun. 3 Coll 2 Jul., 9 records from Mull including 5 prs. breeding Salen area, 28 Bruichladdich, Islay 9 Jul.

0687 **TURTLE DOVE** *Streptopelia turtur*

B. & P. Uncommon.

Single feeding with Collared doves Barcaldine 26 May, 2 Scalasaig 23 May, single Bowmore 22 Sep., and single Coultorsay Oct.

0724 **CUCKOO** *Cuculus canorus*

S. & P. Common. Meadow Pipit main host.

First, Glen Lonan 18 Apr., Easdale 24 Apr., Mull 27 Apr., main arrival there by 16 May. Single calling Connel 12 Jul. Max. 4 (May-Jun) L. Gruinart Reserve probably 2(F), bred. Nos. thought to be down on Colonsay. Single Coll 2 Jul.

0735 **BARN OWL** *Tyto alba*

B. & W. Not common.

Singles dead Gigha, Jun. & Dunbeg 4 Feb. Single dead Glen Forsa, Mull 7 Apr., 2 hit by cars Taynuilt Feb., one recovered, one died. Singles reported from Gairloch, Cowal, 7 Feb. Taynish NNR. Jul., Glen Lonan 20 Oct., Achnacloich 17 Nov., L. Sween 9 Nov., N. Connel 13 Dec. Irregular reports L. Gruinart reserve Jan., Mar., Jul., Aug., Nov., all singles except 2 in Jan. Reports of birds in 6 localities on Mull. No evidence of breeding Mull. At least one pr. reared young Islay. Probable breeding Ballachuan reserve (SWT).

0761 **TAWNY OWL** *Strix aluco*

R. Widespread. Absent Coll & Tiree.

Breeding reported from several areas: present Gigha Jun. 2. L. Gruinart Reserve Jan. and singles most months.



0767 LONG-EARED OWL *Asio otus*

R. & W. Very scarce breeding species but under recorded.
Single, dead, Achnacloich 22 Aug., 1 Glen Lonan 15 Sep.

0768 SHORT-EARED OWL *Asio flammeus*

B. & W. Widespread but nos fluctuate due to emigration out of Argyll after breeding season.

Single Moine Mhor Mar. Apparent emigration from Mull, Mar. with no positive evidence of breeding in 1986. Max. 5 Glen More 1 Mar., 3 Lochdon 16 Mar., 2 Glen Forsa 6 May, and several other records of singles from Mull until 23 May after which no further records until 2 Glen More, Dec. Irregular records L. Gruinart reserve Apr-Jul. and Oct-Dec. (1 pr. bred). Present Gigha Jun. Single Glen Lonan 16 Jun. One Islay report "not so common". Single: Cnoc Nan Gabhar, Kintyre, 19 Aug.: Adult + 3 young Lochan nan Ceardach, Knapdale, 10 Aug.

0778 NIGHTJAR *Caprimulgus europaeus*

Declining species. No records 1986

0795 SWIFT *Apus apus*

S. & P. Absent from several islands but seen there on passage.

First 12 May Connel. Seen Lochgilphead area (also there 1985). Present L. Gruinart reserve May-Aug. max 15 Jun., 10 over Oronsay 15 Jun., 5 Treshnish Isles 15 Jun. Single Tiree 14 Jun.

0831 KINGFISHER *Alcedo atthis*

V.

Five records. Singles Aird's Bay 1-22 Jan., L. Etive Sep., R. Nell 13 Oct. R. Alt Nathais, Taynuilt, 30 Nov., Lusragen Brook, Connel, 8-30 Dec.

0840 BEE-EATER *Merops apiaster*

V.

Single Lochgoilhead Jun. or Jul. (RK. et. al.) subject to BBRC.

0856 GREEN WOODPECKER *Picus viridis*

?B. ?V.

Single Taynish NNR Jul. (well outside normal range, no records 1985).

0857 GREAT-SPOTTED WOODPECKER *Dendrocopos major*

B. W. Widespread in suitable deciduous woods.

Scattered records from mainland. Reported common Mull. One record of a single, said to be "yaffling" like a Green Woodpecker 24 Jan. Glen Cruitten.

0976 SKYLARK *Alauda arvensis*

B/S. P. & W. Widespread & common but many leave in winter.

100+ Achinloan Farm (S. Kintyre) 11 Feb. Passage small flocks c.20-25 Connel/Benderloch 18-20 Mar., 25 Dunadd Mar., 25 Oronsay 9 Apr., 30 Connel 28 Sep., c.345 prs. bred L. Gruinart reserve.

0981 SAND MARTIN *Riparia riparia*

S. & P. Decreasing locally.

First Appin 24 Apr., Arrival Mull 1 May. Colonies reported from Stronghullan Farm, Kintyre, 7 occupied holes; Laggan Bridge Islay, c.6 prs.; N. Connel 4 occupied holes; Lusragen Brook Connel, 1 occupied hole; 14 birds Glen Forsa, with est. 10 holes occupied 20 Jul. Kilmartin 12 holes, 9 occupied (this site was recolonised after desertion in 1982). Present Blairmore, Dunoon, (no count given). 1 Loch Sgoltaire (Colonsay) 19 May (first record 5 yrs). Present Gigha & Dunaverty.

0992 SWALLOW *Hirundo rusticola*

S. & P. Widespread.

First Oban 18 Apr. General arrivals 25-28 Apr. reported from Mull and mainland. Last: 2 Skipness 2 Oct. Present Islay Apr.-Oct., max 200 Aug. Main exodus Southend 16 Sep. Colonsay several prs. Jun. but not common this year all left by mid Sep. 5-10 prs. breeding Tírée, 5+ birds Treshnish Isles 15 Jun.

1001 HOUSE MARTIN *Delichon urbica*

S. & P.

First Aird's Bay 24 Apr. Last: 2 Lochdon 16 Sep., 2nd brood Lochdon fledged 1st. week Sep. Said to be increased nos. Kilmartin area. Records from Colonsay mid May-Jun., 3 occupied nests Ballygrant. Present L. Gruinart reserve May-Sep., 6 prs. bred, and max. 80 Aug.

1009 TREE PIPIT *Anthus trivialis*

S. & P. Common.

Taynish NNR 22 Apr. General arrival Mull 25 Apr. Connel 1 May. Birds reported from two sites Colonsay late May/early Jun. Present Dunadd May. 7 (M) singing N. Mealdarroch May. Movement thro' N. Argyll 8-12 Aug. Single L. Gruinart reserve 2 Sep.

1011 MEADOW PIPIT *Anthus pratensis*

B. & P. Very common breeding species. Flocks in Autumn with many birds leaving Argyll.

Present thro' yr. L. Gruinart reserve, 325 prs. bred, less than 50 present in winter.

1014 ROCK PIPIT *Anthus spinoletta petrosus*

B. & W. Common breeding species around coast.

25 E. Oronsay 6 Apr. Max 72 L. Gruinart reserve in Sep. (15 prs. bred there).

1017 YELLOW WAGTAIL *Motacilla flava*

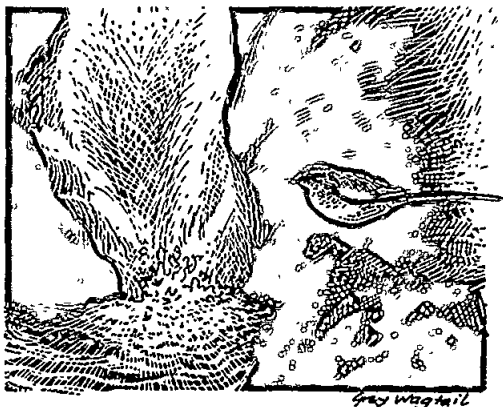
V.

Singles: Single L. Gruinart reserve 17 Sep. and Ross of Mull, 28 May. Single (*Blue-headed race*) Kiloran Dunes 19 May. First record for Colonsay.

1019 GREY WAGTAIL *Motacilla cinerea*

B. W. & P. Widespread in breeding season, many fewer in winter. Uncommon Mull.

Max 5 L. Gruinart reserve Mar., reports from Kintyre, N. Argyll, mid Argyll, Islay. Prs. present at min. 8 sites Mull.



1020 **PIED/WHITE WAGTAIL** *Motacilla alba*

PIED WAGTAIL. B. & P. Common breeding species. Fewer in winter.

Movement (S). Benderloch 20 Aug-16 Sep. 14 Glen Breachene, Kintyre, 20 Aug., 30 Glen Lonan 31 Aug., 15 Southend 16 Sep. 10 prs. bred L. Gruinart reserve, with max 30 Jun/Jul. A pr. bred Garvellachs Isles Jun. Est. 20-40 prs. bred Tiree. 60 Machrihanish airstrip at various dates. 30+ Iona 12 Sep., 20 Killichronan 28 Sep.

WHITE WAGTAIL.

Single Benmore Lodge, Mull 4 Apr.: single Oronsay Priory 9 Apr., 2 L. Gruinart reserve 21 Apr., & single there 24 Apr. Single Balemartin, Tiree, 13 May.

1050 **DIPPER** *Cinclus cinclus*

B. & W. Widespread. Absent Coll & Tiree. Scarce Islay.

Widely reported chiefly winter months. Uncommon Mull, with only 16 sites identified. Movement down to lochshores and coast in winter. Single Mill Burn, Colonsay Apr. Single Loch an Eilean (Tiree) 4 Nov.

1066 **WREN** *Troglodytes troglodytes*

B. & W. Very common.

Present but low nos. Moine Mhor, 11(M), singing S. Mealdarroch Apr., & 10 N. Mealdarroch Jun. 35 prs. bred L. Gruinart reserve.

1084 **DUNNOCK** *Prunella modularis*

B. & W. Common. Uncommon Tiree.

9 prs. bred L. Gruinart reserve. Single site only reported Tiree Jul., single Lunga Treshnish Isles 15 Jun.

1099 **ROBIN** *Erithacus rubecula*

B. & P. Common. Nos. increased by Autumn passage birds.

18 prs. bred L. Gruinart Reserve. 3 Balephetrish, Tiree and 7 Kennovay, Tiree 4 Nov.

1122 **REDSTART** *Phoenicurus phoenicurus*

S. & P. Common breeding species especially in oak woods.

First: Coultorsay, Islay 15 Apr., Mull 27 Apr. (F) Heanish, Tiree 24 Apr., Degnish 16 May. Successful breeding reported from several areas. Single L. Gruinart 26 Sep.

1137 **WHINCHAT** *Saxicola rubetra*

S. & P. Widespread and common breeding species.

First Connel 2 May, Mull, 3 May. c.10-15 prs. bred Colonsay. 8 prs. Glen Lonan, Jun., 5 prs. Kilmore-Oban (alongside road) Jun. and 12 prs. bred L. Gruinart Reserve.

1139 **STONECHAT** *Saxicola torquata*

B. W. & P. Widespread but nos. often fall dramatically after severe winters. Relatively few appear to overwinter in Argyll.

9 prs. bred L. Gruinart reserve. Estimated 12 prs. Colonsay. Successful breeding reported several areas Mull. Other records (singles) from Connel, L. Turruman, Port Mor, S. Kintyre, 3 records Tiree May-Jun. 4 birds Danna Islands 26 Dec. and 4 Keils 5 Oct.

1146 **WHEATEAR** *Oenanthe oenanthe*

S. & P. Common breeding species. Birds of Greenland race. *O. o. leucorrohoa* seen on Spring and Autumn passage.

First 2 (M), Connel 18 Mar., 1 (M) Lochdon 24 Mar. Main arrival Mull late Apr. Last Loch na Keal Mull, 12 Oct. Present L. Gruinart reserve Apr.-Oct. (17 prs. bred there). 4 (M) holding territories Treshnish Isles 15 Jun., 4 (M) 2 (F) Garvellachs Isles 6 Jun. Good breeding season mainland and islands.

1162 ROCK THRUSH *Monticola saxatilis*

V.

Single (F). Croggan, Mull, 15-19 Jun (PWH.HGAH). Subject to BBRC.

1186 RING OUZEL *Turdus torquatus*

S. & P. Uncommon. All records please.

First Bein Bhuide 19 Apr., Mull 23 Apr., Glen Aray 23 Apr. Probable breeding Cruach Lusach, Knapdale. Single Glencoe 18 Aug., 2 Glen Lonan 9 Oct.



1187 BLACKBIRD *Turdus merula*

B. & P. Very common breeding species and large nos. move thro' in Nov. Uncommon Tiree.

11 prs. bred L. Gruinart Reserve. Small flocks (c.10 birds) Taynish NNR autumn, and a new record for Moine Mhor in Dec. Singles Tiree, Hynish 13 May and Gott 13 May.

1198 FIELDFARE *Turdus pilaris*

P. & W.

First: 7 St. Catherine's, Cowal, 17 Aug., main arrivals Connel area 17-20 Oct. (flocks c.30-50, smaller than previous years) max. count Connel 250 on 1 Nov. Mixed flocks (with Redwing) c.220+ Mid Argyll Dec. Present L. Gruinart Jan-May and Oct-Dec. (max. 100 Jan. & 35 Nov). 70 (S) Salen 3 Nov., 6 Tiree 18-22 Dec.

1200 SONGTHRUSH *Turdus philomelos*

B. P. & W. Widespread and common except on some islands.

12 prs. bred L. Gruinart reserve. (M) singing Carnan Mor, Tiree, 4 Jun.

1201 REDWING *Turdus iliacus*

P. & W. Some may stay late in Spring.

First: Single Torrlochan, Mull, 29 Sep., L. Long 3 Oct. movement (S). Connel 14-18 Oct. most flocks c.30-40 with 2 flocks. 70+. 150 (W) Pennygown 18 Oct., 70 Southend 22 Oct., 100 (S) Torrloch 2 Nov., 60 L. Gruinart during Jan-May and 35 in Nov.

- 1202 MISTLE THRUSH *Turdus viscivorus*
 B. W. & P.
 15 L. Gruinart Sep. At least 3 prs. Colonsay, 20 Torrochan 28 Sep.
- 1236 GRASSHOPPER WARBLER *Locustella naevia*
 S. & P. Locally common.
 Regular Gigha. Comment "seemed to be scarce this year" around Lochgilphead. Single Aird's Bay 9 May. 5 prs. bred L. Gruinart (present May-Jul.). Singles Taynish NNR Jun. and Ballachuan Reserve 26 Jun.
- 1243 SEDGE WARBLER *Acrocephalus schoenobaenus*
 S. & P. Locally common.
 First. Frachadil, Mull 13 May, 16 singing Colonsay 31 May-2 Jun., 5 L. Leathan 10 Jun., 22 prs. bred L. Gruinart, 5 prs. Taynish NNR. Est. 25-30 prs. Tree Jun. Min. 4 prs. Coll, Jul. Singing males at min 7 sites, Mull. Single Garvellachs Isles 6 Jun. Singles and prs. from other localities.
- 1274 LESSER WHITETHROAT *Sylvia curruca*
 Rare passage migrant.
 (F) feeding young Dervaig area 25 May. This, as yet unconfirmed report, is the only record this decade for Mull.
- 1275 WHITETHROAT *Sylvia communis*
 S. & P. Common and widespread.
 First. Mull 10 May, Connel 15 May. Last: L. Assapol (Mull) 5 Sep. At least 7 prs. Colonsay 31 May-4 Jun. 3 prs. Coultorsay. Breeding reports from L. Gruinart, Ballachuan, Kilmartin, Southend. Records indicate good breeding season. Single Garvellachs Isles 6 Jun.
- 1276 GARDEN WARBLER *Sylvia borin*
 S. & P. Scarce breeding species.
 Singles Camas Cuin, Mull, 24 Apr., Connel 15 May, L. Gruinart 4 May & 5 Jun., 2 there 27 Apr. Singles Glen Creran 22 Jun., Gruline 27 Jun., Glen Lonan 1 Jul., 2 records Taynish NNR Jun-Jul.
- 1277 BLACKCAP *Sylvia atricapilla*
 S. W. & P. Scarce breeding species, a few over winter and feed at birdtables.
 First Connel 8 May. Singles Taynish NNR May, L. Gruinart 9 May, and on 1, 13 & 22 Jun. and 30 Aug., singles singing Dunbeg and Glen Cruitten Jul. Several prs. bred Gigha. 4 records Colonsay, May-Jun. and single (M) Oronsay 30 Nov. Feeding at bird table (M) Blairmore 1-4 Feb. (F) Macharioch 16-17 Dec. Single (F) Aros Bridge, Mull, Dec.
- 1308 WOOD WARBLER *Phylloscopus sibilatrix*
 S. & P. Common in oak woods.
 First Tiroran, Mull, 29 Apr., general arrival Connel area 7/8 May, singles L. Gruinart 4 May & 29 Jul.
- 1311 CHIFFCHAFF *Phylloscopus collybita*
 S. & P. Not common. November records not unusual.
 Present 5 locations Colonsay. A pr. bred L. Gruinart, and 4 present there Apr-Jul., 2+ both Letterwalton and Achnacloich May. 4 records (all) Mull, May-Jul. Single Coll 2 Jul. Single Connel 13 Nov.
- 1312 WILLOW WARBLER *Phylloscopus trochilus*
 S. B. & P. The commonest warbler in Argyll.
 First: Connel 20 Apr. Scarisdale 24 Apr. Several in song Tayvallich 24 Apr., 64 prs. bred L.

Gruinart. 38 singing N. Mealdarroch May and 23 singing S. Mealdarroch Jun. Single Coll 2 Jul., 4 records from Tiree May-Jun. Last Connel 18 Sep.

1314 GOLDCREST *Regulus regulus*

B. W. & P. Common breeding species.

Small flocks, c.20 birds, Colonsay winter. Absent L. Gruinart Jun-Aug. and max 9 there Jan. Movement noted Lochdon 18 Sep.

1335 SPOTTED FLYCATCHER *Muscicapa striata*

S. & P. Widespread breeding species but low density.

General arrival Mull 18 May. Reported May-Aug., from many localities. Pr. bred L. Gruinart 2+ prs. on Colonsay. New record from N. Mealdarroch, Jun.

1349 PIED FLYCATCHER *Ficedula hypoleuca*

P. & B. Rare passage migrant and breeder.

Singles (M). L. Etive 25 May, and (M) Glen Shira 25 May.

2 prs. reported breeding in nest boxes Inverary. Nest boxes are being provided at several sites in 1987.



1437 LONG-TAILED TIT *Aegithalos caudatus*

B. & W. Widespread.

Good breeding season. Irregular L. Gruinart reserve Jan-May, (max 14 Feb). Max 25 Taynish NNR winter/autumn.

1461 COAL TIT *Parus ater*

B. & W. Common.

Max. 21 L. Gruinart reserve Jan. 2 prs. bred there.

1462 BLUE TIT *Parus caeruleus*

B. & W. Very common but absent from some islands.

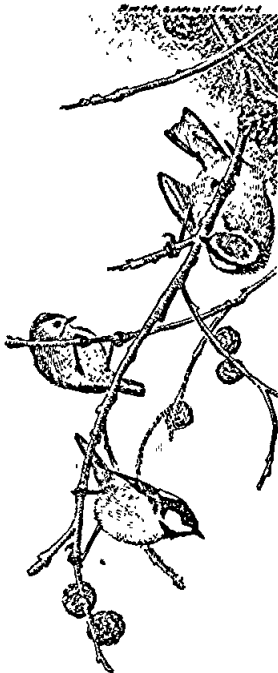
1464 GREAT TIT *Parus major*

B. & W. Common.

Records from Islay & Colonsay.

1486 TREECREEPER *Certhia familiaris*

B. & W. Common but absent Coll & Tiree.
2 prs. bred L. Gruinart reserve.



1539 JAY *Garrulus glandarius*

B. & W. Absent from islands.

Records from all parts of mainland. Some evidence of general increase late winter in Lorn area. Bred Taynish NNR (new record). Present Killinnochnoch Dec. (new record).

1549 MAGPIE *Pica pica*

B. Irregular in some areas, status uncertain. Rare outside Cowal.

Two records received: single, infrequent, visitor to bird table Blairmore, Dunoon, winter months. Single Heylipol, Tiree 3 Jan.

1559 CHOUGH *Pyrrhocorax pyrrhocorax*

B. & W. on Islay, Jura and Colonsay. Kintyre apparently deserted.

50-60 Kilchoman 15 Mar., 49 L. Gorm 16 Mar., 9 Kinnabus Mull of Oa 16 Mar., 2 Oronsay Priory 5 Apr., 9 Kiloran Dunes, Colonsay 9 Jun., 2 Cean a Mhara, Tiree Jun. One Colonsay bird (colour ringed) had been ringed Islay 1983. Present thro yr. L. Gruinart reserve, 2 most months with max. 20 in Dec. and 12 in Nov., 6 Octafad, Islay, 19 Oct., Single Cean a Mhara, Tiree, winter 85/86. Prs. at Kiloran Bay, Pigs Paradise, L. Fada, Balerominddhub and Uragaig in May/Jun.

1560 JACKDAW *Corvus monedula*

B. & W. Very common but non breeder Col, Tiree, Treshnish Isles, and most of Mull.

Roost c.90 birds at Mulindry Fm., Islay, 22 Aug. Roost c.60 Connel Bridge, 17 Kiloran Dunes 8 Apr., max. count 120 L. Gruinart reserve Oct., 10 prs. bred on reserve.

1563 ROOK *Corvus frugilegus*

B. & W. Common but absent as breeding species from Coll & Tiree and also absent much of Mull.

New rookery established Ballachuan Reserve Apr/May with c.40 nests, this rookery displaced a well established heronry. At L. Gruinart reserve 49 prs. bred. Influx of birds into Mull in winter (counts 28, 21 and 7 in three areas there, Oct/Nov).

1567 CARRION/HOODED CROW *Corvus corone*

B. & W. Common. Hooded predominant islands and N. Argyll but Carrion Crow spreading northwards.

Winter roost c.15 L. Gruinart reserve (with max. 20 there Dec.)

3+ Treshnish Isles 15 Jun., 26 Lochdon, Mull 31 May. Bad breeding season on Colonsay. Hybrid Carrion Crow/Hoodie Kiloran Dunes 8 Apr.

1572 RAVEN *Corvus corax*

B. & W. Very common.

150 Tobermory 30 Jan., 15 Fearnoch 22 Aug., max 10 L. Gruinart reserve in Dec. At least 10 prs. bred successfully with av. 3 yng. fledged per pr. Knapdale/mid Argyll. 2nd yr. of 3 yr. breeding survey in Mull showed 52 nest sites so far identified, of which 80% coastal. Uncommon on Tiree, bred Gott Bay (3 fledged), 4-5 prs. probably bred Colonsay, 2 ads + 3 juvs Coll, 2 Jul. Bred Garvellachs Isles.

1582 STARLING *Sturnus vulgaris*

B. W. & P. Common. (Uncommon Mull)

Max. count 500 L. Gruinart reserve in Sep., and 30 prs. bred there. c.100 Oronsay 8 Apr. At Scalasaig a pr. nested below ground at base of an Ash tree, Jun.

1591 HOUSE SPARROW *Passer domesticus*

R. Scarce on some islands.

13 Balephetrish Hill (Tiree) 4 Nov.

1636 CHAFFINCH *Fringilla coelebs*

B. W. & P. Abundant.

Max 100 L. Gruinart reserve Sep/Oct., 39 prs. bred there. 300 Kilberry 26 Jan.

1638 BRAMBLING *Fringilla montifringilla*

W. & P. Absent some winters.

Singles L. Gruinart reserve Nov-Dec and up to max 4 Jan-Apr., 3 Coultorsay 30 Mar., and single Southend 20 Mar.

1649 GREENFINCH *Carduelis chloris*

B. & W. Patchy distribution.

Max. 100 L. Gruinart reserve Aug., 4 prs. bred there. 13 Oronsay Priory 9 Apr., several prs. Colonsay May-Jun. Uncommon Mull (2 prs. bred Lochdon). Single Garvellach Isles 6 Jun.

1653 GOLDFINCH *Carduelis carduelis*

B. & W. Patchy distribution. Absent as breeder Coll, Tiree, Colonsay and Iona.

25 Connel 5 Jan. Max. count 120 L. Gruinart reserve, Islay in Sep. Ads.+ juvs Ardnahoe Loch 23 Aug. Bred: 2-3 prs. Glenshallach, 2 prs. Glen Cruitten, 1 pr. Gallenach. Reported from 6 areas Mull but no confirmed breeding. 10 Dunollie 25 Dec.

1654 SISKIN *Carduelis spinus*

B. P. & W. Locally common. Absent breeder Colonsay, Coll, Tiree and Iona.

Max. 20 L. Gruinart reserve in Jan., 60 Ledaig Point 20 Apr., Immigration into Benderloch/Connel area during Apr.-May (average flock size 25-30), c.100 trapped and ringed Barcaldine

Apr.-May. Large influx into Mull Mar.-Apr., with smaller influx mid Sep. None seen autumn/winter Colonsay.

1660 LINNET *Carduelis cannabina*

c.100 Oronsay Priory Field 5 Apr. Max. 100 L. Gruinart reserve Aug/Sep, (5 prs. bred there). Bred several areas around Oban. 36 Baile Mor, Iona 12 Sep. Uncommon on Tiree. 2 pr.+ Arinagour, Coll 3 Jul.

1662 TWITE *Carduelis flavirostris*

B. W. & P. Locally common. Scarce Cowal and mid Argyll.

120 Clachan Mor 1 Jan., 100 Oronsay Priory Field 5-11 Apr. Single Coll 2 Jul. and 10 Garvellachs 6 Jun. Max. 40-50 Connel Airstrip/Ledaig Point autumn, 40 Cuil Bay 17 Sep., 100 Sanaigmore 16 Sep. Uncommon Mull, with main conc. Ross of Mull/Iona & NW coast. 45 L. Gruinart reserve Aug. Pr. Achnacree Moss 5 Jun.

1663 REDPOLL *Carduelis flammea*

B. W. & P. Common but local. Absent breeder Coll, Tiree and Iona.

20 Aird's Bay Jan. Max. 150-200 N. Mealdarroch Jan., and 100-150 S. Mealdarroch, Mar. 50 Glen Clahaig, Mull 27 Mar., 3 Urugaig Plantation 31 May, 104 Killinnoch Dec., 6 L. Gruinart reserve Nov-Dec. Singles Dun Noseborg (Jura) 17 Sep., and Leagybeck (Jura) 18 Sep.

MEALY REDPOLL *C.c. flammea*

6 Connel 17 Feb. (ARJ)

1666 CROSSBILL *Loxia curvirostra*

B. & W. Scarce Islay and Jura.

Small flocks of c.25 Barcaldine, Connel and Glen Lonan, feeding on Larch cones Jan-Mar. Few records from Mull (max. count 11 at L. Ba on 8 Jun.) but no Mull records of breeding. 12-15 Kildalton, Islay 21 Jun. A possible Scottish Crossbill *L. scotica*, noted at Doire Darroch L. Tulla, 5 Jun. (DJ).

1710 BULLFINCH *Pyrrhula pyrrhula*

B. & W. Common some areas but absent from Coll & Tiree and irregular Colonsay and Gigha.

Small flocks (max. 24) Taynish NNR, Jan. and 7 Mealdarroch Jan. Associated with conifers in many places in Mull; 9 Torrlachan 1 Mull, Nov., 5 L. Gruinart reserve Feb.

1717 HAWFINCH *Coccothraustes coccothraustes*

V. Uncertain status.

4 Gruinart 23 Feb. (PGB). 1st record for Islay.

1850 SNOW BUNTING *Plectrophenax nivalis*

P. W. & ? B. Breeding status uncertain.

7 (M) Crossapol 1 Jan., 3 Dunadd Jan., 15 L. Gruinart reserve Jan and 6 there Nov., 2 Gigha 4 Oct. and 4 on 12 Dec. c.50 Bein a Bhuiridh 8-9 Nov., 3 records from Mull, (F) Ardochoil, (F) Glen More and 3 (M) Fidden, all Jan. Pr. in full b. plumage (and M. in song) Colonsay 3 May, 6 Colonsay 25 Oct., and 22 Balnahard 10 Nov.

1857 YELLOWHAMMER *Emberiza citrinella*

B. & W. Common but local.

At least 6 prs. Gigha, 7+ Colonsay, 6 prs. Connel Jul., 13 prs. along roadside between Kilmore-Connel Jul., 3 prs. Glenshallach Jul. Records from Kilmartin, Ardfarn, Barloisnoch, Clachandubh and Ford. Singles L. Gruinart reserve Mar. Apr. May, Nov., and single (M) Garvellachs Isles 6 Jun. Uncommon Mull, chiefly N & W coasts and Ross of Mull.

1877 REED BUNTING *Emberiza schoeniclus*

B. & W.

Max. count 65 L. Gruinart reserve in Jan., (8 prs. bred on reserve). Fewer at Taynish NNR, than in 1985. At least 3 prs. L. Fada 17 Jun. (est. 7 prs. Colonsay). Est. 20-25 prs. Tiree 24 May-7 Jun. Other records from mid and N. Argyll. Uncommon Mull, at least 4 singing (M) Coll 2 May.

1882 CORN BUNTING *Miliaria calandra*

R. & P. Kintyre, Tiree and Coll. Regular breeding only on Coll, Tiree and sometimes Gigha. May be local movements.

Incomplete count gave singing birds at min. of 4 sites Tiree, May-Jun.

Amendments to the 1985 Report

Additional records

The following records were received after publication of the 1985 Report:

0003	B. T. Diver	2 and 2 off S. Mealdarroch Jun.
0011	Slavonian Grebe	Max. 9 Linne Mhuirich Nov.
0204	Scaup	c.25 Kiloran Bay 28 Nov.
0218	Goldeneye	Max. 50 Linne Mhuirich rapids Nov.
0243	Sea Eagle	Immat. Taynish Island Jan.
0261	Hen Harrier	Winter roost S. Argyll mainland, max. 10 in Feb. and 8 in Dec.
0267	Goshawk	Single Barr Mor. Sep.
0599	Glaucous Gull	Single ad. Oban Bay 1 Jun.
0735	Barn Owl	Taynish House grounds (no dates)
0876	Gt. Sp. Woodpecker	3 drumming Taynish NNR Mar.

Corrections

0615	Common Tern	Should be 20 colonies Port Olmsa and not 200
0579	Sabine's Gull	The record of Sound of Mull 18 Sep. has not been accepted by SBRC.
0040	Gt. Shearwater	The record of Coll 5 Aug. has not been accepted by SBRC.

**TABLE 1. MONTHLY MAXIMA FOR WILDFOWL 1986.
LOCH GRUINART, RSPB RESERVE**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Shelduck	109	186	137	235	92	105	45	77	9	15	11	19
Wigeon	111	248	158	309		1			23	150	303	165
Teal	12	53	22	75	20	35	30	25	225	205	420	61
Mallard	102	176	53	51	61	100	50	86	257	78	65	114
Pintail									1	11	4	4
Eider		6	7	37	41	120	79	83	29	11	3	2
Goldeneye	12	24	13	11						1	2	5
Red-breasted Merganser	10	16	7	11	7	18	6	26	103	25	38	10

**TABLE 2. MONTHLY MAXIMA FOR WADERS 1986.
LOCH GRUINART, RSPB RESERVE**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Oystercatcher	42	101	405	496	220	295	230	581	159	63	46	90
Ringed Plover	73	43	40	42	32	26	23	66	117	80	33	141
Golden Plover	44	53	2	73	4	1		2	50	120	65	46
Grey Plover	8	1	1	1					3			
Lapwing	40	40	185	498	470	274	200	600	420	625	353	4
Dunlin	250	207	45	20	100	19	23	15	44	10	18	240
Bar-tailed Godwit	27	53	62	41	1	4	4	12	5	6	5	9
Whimbrel					7	10	1	1	2	2		
Curlew	312	241	161	271	110	216	120	838	611	625	369	538
Redshank	14	24	30	105	55	52	40	36	25	11	54	20
Turnstone	40	120	52	33	6					25	21	60

**TABLE 3. MONTHLY MAXIMA FOR GULLS 1986.
LOCH GRUINART, RSPB RESERVE**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Black-headed Gull	2	2	108	327	53	120	112	140	134	208	12	1
Common Gull	364	172	131	81	200	101	79	87	223	425	149	80
Lesser Black-backed Gull	3			30	61	126	17	2	11	1		1
Herring Gull	70	53	85	109	92	96	63	66	500	570	8	33
Great Black-backed Gull	34	19	5	15	22	20	7	13	22	23	7	33

TABLE 4. NCC GOOSE COUNTS, ISLAY, 1986

	JAN	FEB	MAR	APR
Barnacle Goose	18246	17916	17251	17271
Gr. Whitefront	5114	4885	4498	5669
Pink-footed Goose	8	0	3	3
Canada Goose	10	11	1	1
Greylag Goose	83	21	0	0
Whooper Swan	0	1	1	0

**TABLE 5. MONTHLY MAXIMA FOR GEESE 1986.
(INCLUDING ROOST COUNTS)
LOCH GRUINART, RSPB RESERVE**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Pink-foot. G										2	1	1
White-Fronted Goose	460	260	103	78	19				11	1500	1500	270
Greylag Goose										8		
Canada Goose (can'sis)										1	1	1
Canada (hutch'ii)			1									
Barnacle Goose	11000	11000	11000	11000	70	1	1		6	18000	12000	11000
Brent Goose				1					61	200	2	

The figures for Barnacle Geese refer to roost counts. Those for White-fronts refer to both roosting and feeding, whichever is highest. (The 1500's are moorland roosts, the remainder are feeding. The roost decreases in size as the season progresses).

TABLE 6. MONTHLY BIRD COUNTS: LOCH INDAAL 1986 (RSPB)

SPECIES	A	B	C	D	E	F
Red-t-Diver	2		3	3		
Great N Diver	4	1	3	1	1	
Little Grebe	1					
Slavonian Grebe	3	6				
Fulmar					1	
Cormorant	22	3	12	7	1	
Shag	15	32	21	3	1	
Grey Heron			1			
Mute Swan	6	3	3	3		3
Shelduck	46	33	53	32	73	15
Wigeon	341	243	113	47		
Teal	2	20	11	33	4	
Mallard	255	224	68	49	167	104
Pintail				11	3	
Shoveler		8				
Scaup	1505	200	1152	488		
Eider	91	132	155	305	161	418
Long-tailed Duck	3	1				
Common Scoter	3	1	2	6	10	
Goldeneye	27	14	20	22		
Smew	1			1		
Red-breasted Merganser	47	12	19	17	6	7
Oystercatcher	361	450	923	805	391	307
Ringed Plover	33	40	64	65	89	23
Golden Plover		47	44	26		
Grey Plover	17	23	7	7		

TABLE 6. (continued)

SPECIES	A	B	C	D	E	F
Lapwing	1		75	51	40	23
Knot		35				
Sanderling		5	5	3		
Purple Sandpiper	2		17		1	
Dunlin	21	132	102	16	116	
Snipe	3					1
Bar-tailed Godwit	1	106	67	36	15	4
Curlew	53	357	155	80	37	57
Redshank	7	13	55	93	12	14
Greenshank		6	1	2		
Common Sandpiper					2	3
Turnstone	43	57	26	48	3	
Arctic Skua					1	
Black-headed Gull	36	52	140	317	171	68
Common Gull	181	241	228	102	126	93
Lesser BB Gull				112	87	9
Herring Gull	357	223	214	173	112	53
Glaucous Gull	2	2	1			
Great BB Gull	68	34	46	55	27	9
Kittiwake	1					
Common Tern					1	
Arctic Tern					70	46
Guillemot			1	4		
Black Guillemot	1		1			3

A = 11/1/86

B = 10/2/86

C = 11/3/86

D = 15/4/86

E = 26/5/86

F = 27/6/86

TABLE 7. MONTHLY BIRD COUNTS: LOCH INDAAL 1986 (RSPB)

SPECIES	A	B	C	D	E	F
Red-t-Diver				1	6	7
Black-t-Diver						3
Great N. Diver				2	1	5
Slavonian Grebe			13	18		13
Gannet			1			
Cormorant	4	14	2	11	13	18
Shag			40	40	5	7
Grey Heron	2	3	9	2		1
Great Crest. Grebe					1	
Mute Swan	3	5	8	9	8	1
Whooper Swan			1	2	2	2
Pinkfooted Goose					2	
Greylag Goose					16	17
Brent Goose		3		56	3	3
Shelduck	20	11	3		3	8
Wigeon			303	263	279	623
Teal	2		79	86	776	312
Mallard	107	48	301	219	397	423

TABLE 7. (continued)

SPECIES:	A	B	C	D	E	F
Pintail				16	4	23
Shoveler			2	2	10	
Scaup			65	503	729	445
Eider	579	177	287	275	305	309
Long-tailed Duck					2	2
Common Scoter			45	56	11	9
Goldeneye				1	15	24
Smew					1	
Red-breasted Merganser	24	8	171	178	74	29
Moorhen		4		2		
Oystercatcher	874	353	374	458	380	485
Ringed Plover	33	41	88	24	67	65
Golden Plover		19	16	28	81	22
Grey Plover			1			
Lapwing	12	44	129	365	10	271
Sanderling				6	2	2
Purple Sandpiper					11	3
Dunlin	3	54	10	3	47	190
Snipe					5	2
Bar-tailed Godwit	7	1		3	2	1
Curlew	502	457	466	774	507	667
Redshank	49	6	13	17	23	20
Common Sandpiper	3					
Turnstone	1	2	20	13	24	28
Black-headed Gull	284	217	63	59	8	36
Common Gull	253	148	139	286	242	186
Lesser BB Gull	36	47				
Herring Gull	119	138	149	465	141	267
Glaucous Gull				1	3	
Great BB Gull	17	42	29	36	47	108
Kittiwake			3			1
Arctic Tern	16					
Guillemot			5			5
Black Guillemot			7	7	2	2

A = 19/7/86
 B = 11/8/86
 C = 20/9/86
 D = 18/10/86
 E = 17/11/86
 F = 15/12/86

RESULTS OF BIRD RINGING IN ARGYLL IN 1986

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1. INTRODUCTION

In 1986, eleven ringers or groups operated in Argyll and together ringed 4860 birds. Four of these ringers were Argyll residents, who together ringed 3054 birds (63% of county total). Seven visitors or visiting groups ringed 1806 birds (37% of county total). 1312 of the latter (27% of county total) were seabirds ringed by the Treshnish Auk Group on their biennial visit to the Treshnish Islands. Their ringing totals have not been included in previous Argyll ringing reports.

All the Storm Petrels, Guillemots and Razorbills were ringed by the Treshnish Group. All the Wheatears, Linnets and most of the Twite were ringed by a visiting ringer (D.C. Jardine), while most of the Swans were ringed by another regular visitor (D. Trigg). This indicates the scope for visitors to the county to make valuable contributions by ringing species not covered by the interests of resident ornithologists.

Other specialist studies in progress in Argyll include Common Gull, Common and Arctic Terns (C. Craik), Chough (E. Bignal), and Golden Eagle (M. Gregory). The Eider study (C. Galbraith, Dept. of Zoology, University of Aberdeen) has now finished, but Colin still welcomes reports of wing-tagged Eiders, giving tag number and colour, place and date observed.

II. NUMBERS OF BIRDS RINGED IN ARGYLL IN 1986

Species	Fully Grown	Chicks	Total
Fulmar	3		3
Storm Petrel	800		800
Mute Swan	41		41
Buzzard		2	2
Golden Eagle		9	9
Merlin		2	2
Oystercatcher		11	11
Ringed Plover		1	1
Lapwing		23	23
Redshank		1	1
Common Sandpiper	5	7	12
Black-headed Gull		107	107
Common Gull	17	308	325
Herring Gull		341	341
Great Black-backed Gull		17	17
Sandwich Tern		1	1
Common Tern		1453	1453
Arctic Tern		296	296
Guillemot	180		180
Razorbill	160		160
Black Guillemot		4	4
Puffin	173		173
Tawny Owl	5	28	33
Sand Martin	31		31
Swallow		11	11
Meadow Pipit	5		5
Rock Pipit	1	1	2

II. NUMBERS OF BIRDS RINGED IN ARGYLL IN 1986 (contd.)

Species	Fully Grown	Chicks	Total
Grey Wagtail		5	5
Pied Wagtail	1	11	12
Wren	1		1
Dunnock	9		9
Robin	17		17
Redstart	1		1
Whinchat	3		3
Wheatear	1	22	23
Blackbird	10	14	24
Song Thrush	1	3	4
Redwing	1		1
Sedge Warbler	5		5
Wood Warbler		19	19
Willow Warbler	22	12	34
Goldcrest	2		2
Spotted Flycatcher	1		1
Coal Tit	23		23
Blue Tit	68	10	78
Great Tit	63	6	69
Chough	9	72*	81
Crow		7	7
Starling	2	1	3
House Sparrow	3		3
Chaffinch	200		200
Greenfinch	16		16
Siskin	105		105
Linnet	24		24
Twite	45		45
Reed Bunting	1		1
Total	2055	2805	4860

* incl. 32 colour-ringed only.

III. RECOVERIES REPORTED DURING 1986

The following is a selection of the more interesting recoveries of which I was notified by the end of March 1987. Ringing details are given on the first line and recovery data on the second line. The age when ringed is given according to the EURING code: note that these numbers do not represent age in years:

- 1 nestling or chick
- 2 fully grown, year of hatching unknown
- 3 hatched during year of ringing
- 3J in juvenile plumage when ringed (age 3)
- 4 hatched before year of ringing, exact year unknown
- 5 hatched in previous year
- 6 hatched before previous year, exact year unknown etc.

M, F sex

The manner of recovery is coded as usual:

- v caught or trapped, and released
- vv rings seen or read in field
- † shot or killed by Man
- x found dead

STORM PETREL

2252745	4	31.7.83	Strathy Pt., Caithness
	v	30.7.86	Sanda, Kintyre
		378 km	194 deg. 1095 days

SHAG

Two movements of less than 90 km were reported. Only two were over 90 km.

1188765	1	1.7.84	Isle of Canna, Highland
	x	15.4.86	Isle of Luing, Argyll
		109 km	148 deg. 653 days
1237793	1	29.7.86	Canna
	+	14.10.86	Dunstaffnage, Oban (fish farm nets)
		96 km	132 deg. 77 days

HERON

1192497	1	29.6.83	Glen Isla, Tayside
	x	1.6.85	Luing, Argyll
		156 km	248 deg. 703 days

MUTE SWAN

Z49718	1	15.9.82	Ormiclate, S. Uist
	x	12.5.86	Dun Ibrig, Tiree
		93 km	157 deg. 1335 days

WHITE-FRONTED GOOSE

Breeding birds of the Greenland race of this species were ringed with Darvic rings (legible at a distance) on expeditions to Greenland in 1979 and 1984 by the G.W.G. study group (leader: D.A. Stroud, 5 Parkway, Nassington, Peterborough PE8 6QE: all sightings to him please). Further birds caught in Wexford, Eire, in late 1985 by the Irish Forest and Wildlife Service were fitted with numbered neck collars. The lower line in the table gives the number of these marked birds seen on Islay, Argyll, in winter 85-86/total seen in British Isles in same period (source: G.W.G. in Britain 1985-86).

	Greenland 1979	Greenland 1984	Ireland 1985
Number marked	96	88	135
Number seen 85-86	14/18	24/40	11/14

Once again, these results emphasise the great importance of Islay for this species.

BARNACLE GOOSE

Copenhagen	6M	25.7.85	Karupelv, Traill O, E. GREENLAND 73°N
3020534			24°W
	x	5.3.86	Oronsay, Argyll 56°N 6°W

BRENT GOOSE

(Colour Ring)	?		(A summer of 1984-86). Bathurst Is., N.W. Terr.
			CANADA 75°N 100°W
	vv	9.10.86	Colonsay, Argyll (among a party of 22) 56°N 6°W

SHELDUCK

GJ14376	4M	2.12.83	Teesmouth, Cleveland
	x	25.4.86	Isle of Gigha, Argyll
		314 km	292 deg. 875 days

KESTREL

EK16682	1	10.6.85	Kielder, Northumberland
	x	19.12.85	Ardishaig, Argyll (dying)
		230 km	292 deg. 192 days

OYSTERCATCHER

FV93021	6	9.3.81	Campbeltown, Argyll
	v	24.5.86	Fort George, by Inverness
		257 km	21 deg. 1900 days

GOLDEN PLOVER

DN32988	1	30.5.85	Kellan Mill, Mull, Argyll
	+	15.2.86	Santanda <i>SPAIN</i> (shot)
		1456 km	174 deg. 261 days

DUNLIN

NE90806	1	4.6.82	Salen, Mull
	v	5.4.85	Poole Harbour, Dorset
		697 km	158 deg. 1036 days

BLACK-HEADED GULL

EN76404	1	13.7.86	L. Sunart, Argyll
	x	1.10.86	Ballymoney, Antrim, <i>N. IRELAND</i>
		174 km	187 deg. 80 days

COMMON GULL

EK23571	1	8.6.83	Oban, Argyll
	x	3.2.86	Waterville, Kerry, <i>EIRE</i>
		603 km	211 deg. 971 days
EN24600	1	17.6.85	Oban, Argyll
	x	12.7.86	Ardrossan, Strathclyde
		98 km	158 deg. 390 days
EN24725	1	20.6.85	Oban, Argyll
	x	10.11.86	Abbeytown, Cumbria
		225 km	144 deg. 508 days

Recoveries to date of Common Gulls ringed as chicks in the Oban area during the seven years 1980-1986 are shown in Fig 1. All were found dead or dying, some having been shot. Note the predominantly southerly movement, and the small but distinct difference from the recoveries of Herring Gulls ringed in the same area (Fig. 2).

HERRING GULL

Only recoveries over 100 km are given.

GJ99367	1	4.7.85	Nr. Lismore, Argyll
	vv	7.2.86	Ainsdale, Merseyside
		357 km	155 deg. 218 days
GJ99075	1	23.6.84	Nr. Lismore, Argyll
	x	29.11.86	Nr. Caernarvon, Gwynedd
		386 km	169 deg. 889 days
GH41270	1	8.7.86	East Mull, Argyll
	x	4.12.86	Warrington, Cheshire (oil victim)
		389 km	150 deg. 149 days

Three colour-ringed birds were seen on Mull in May/June. Two had been ringed as fully grown birds at Glasgow and Stirling rubbish tips on 31.1.79 and 29.3.82. One had been ringed as a chick on the Clyde estuary in 1981.

Recoveries to date of Herring Gulls ringed as chicks in the Oban area during 1980-86 are shown in Fig. 2. Note the concentration of recoveries in larger towns and cities.

COMMON TERN

XR20846	1	12.7.86	Near Oban, Argyll
	v	15.12.86	Near Laayoun, <i>MOROCCO</i>
		3290 km	191 deg. 126 days Alive and released on fishing boat

ARCTIC TERN

XR27196	1	21.7.86	Gigha, Argyll
	x	11.9.86	Rosslare Pt., Wexford, <i>EIRE</i>
		380 km	186 deg. 52 days

PUFFIN

A colour-ringed puffin seen Lunga (Treshnish Isles, Argyll) 15.6.86 had been ringed on Isle of May as a chick in 1976. Believed to be breeding on Lunga.

SAND MARTIN

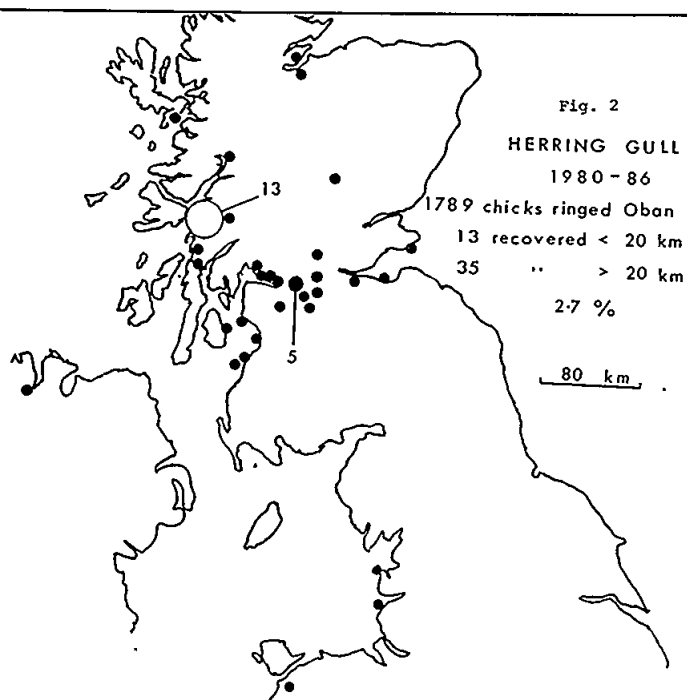
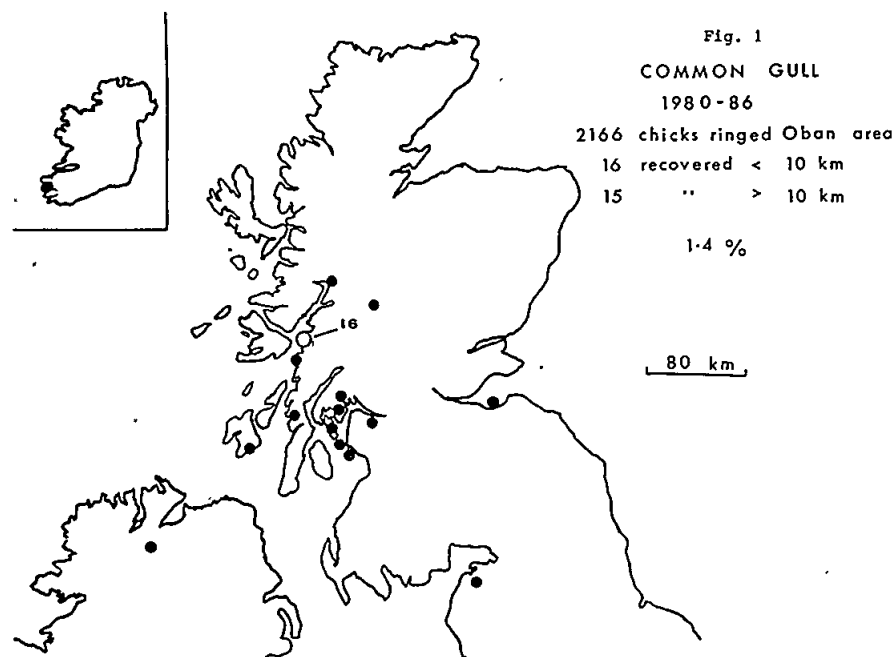
B572845	3J	31.7.83	North Connel, Oban, Argyll
	+	2.4.86	Hamrun, <i>MALTA</i>
		2737 km	147 deg. 976 days

SISKIN

C010593	5M	9.5.85	Barcaldine, Oban, Argyll
	v	17.5.86	Drumguish, Kingussie, Highland
		103 km	53 deg. 373 days
C473505	5M	14.4.86	Wellington, Telford, Shropshire
	v	17.5.86	Barcaldine
		461 km	337 deg. 33 days
C667772	5F	16.2.86	High Wycombe, Bucks
	v	3.5.86	Barcaldine
		625 km	331 deg. 76 days
E042007	5M	30.3.86	High Wycombe, Bucks
	v	14.5.86	Barcaldine
		623 km	331 deg. 45 days
B360925	5F	8.3.86	Exeter, Devon
	v	20.5.86	Barcaldine
		655 km	349 deg. 73 days
KJ07554	5M	15.3.86	Uxbridge, London
	x	8.5.86	Lochgair, Argyll
		595 km	327 deg. 54 days
C430404	5F	30.3.85	Dingwall, Highland
	x	17.5.86	Sandbank, Argyll
		181 km	190 deg. 412 days

Acknowledgements

I am grateful to the following for submitting records: E. Bignal, R. Broad, G. Carr, J. Clarke, S. Eccles, M. Gregory, Highland Ringing Group, B. Lawson, M. Madders, P. Monaghan, M. Morris-Jones, D. Jardine, J. Lewis, S. Petty, R. Proctor, S. Spick, D. Stroud, D. Trigg, V. Tulloch.



A SURVEY OF CORNCRAKES ON ISLAY 1986

BY PETE MOORE, RSPB ISLAY

Introduction

The corncrake, *Crex crex*, has suffered a drastic decline over the past 40 years, not only in Britain but in Western Europe as a whole. At one time widespread throughout Britain, a national survey in 1978-9 (Cadbury, 1980), found that the Outer and Inner Hebrides accounted for 37% and 34% respectively of calling birds. Populations are declining even in these favoured areas.

Increasingly intensive agricultural methods, in particular the mechanisation and earlier mowing of the hay harvest along with a general change from hay to silage, are thought to be largely responsible for the decline. Other factors, such as difficulties experienced on migration and on their wintering grounds in S.E. Africa may well have contributed to the decline.

22-24 calling birds (that is, presumed breeding pairs) were recorded on Islay in 1978 as part of a national survey organised by the British Trust for Ornithology and the Scottish Ornithologists Club, (Cadbury 1980).

20-29 calling birds were recorded in June 1985 in a local survey organised by Judy Stroud (Stroud 1985).

The present survey aimed to ascertain the status of the corncrake on Islay during 1986.

Methods

Stroud (1985) listed 80 sites from which birds had been recorded calling at least once in the last 25 years. Almost all of these sites, plus a few not listed, were visited at least once during June 1986.

At least 30 minutes were spent at most of these sites between 2230 and 0300 BST.

Notes on habitat were made at the sites where calling birds were heard.

An advertisement was placed in the local newspaper, *The Illeach*, requesting information on corncrakes seen or heard in 1986.

Results

Sites of calling birds in 1986 are listed in Table 1 along with habitat details. Fig. 1 shows the distribution of corncrake sites on Islay.

Discussion

The Rhinns. Of the 23 sites, 17 were in the four 10km squares of The Rhinns area of Islay. The increasing relative importance of this area for Islay's corncrakes was noted by Stroud (1985). The continued use of more traditional farming methods on the Rhinns is thought to be significant.

Coul. In recent years, the ditch edges on this farm have been left ungrazed and thus well vegetated specifically for corncrakes and with dramatic effect. Four males were regularly heard calling from this small area between 1981 and 1985 and five were heard in 1986. An area of a few metres on either side of the ditches has been fenced off to prevent grazing. The remainder of the area consists of well-grazed sheep pasture and improved grassland.

Habitat notes. Stowe and Tonkin (1985) as a result of a survey in Uist, Outer Hebrides suggested that home ranges of male corncrakes varied in size from 4 to 40 hectares. The size of Islay's corncrake territories was not known and it was also not known if the male's calling site was centrally located within that territory. Vegetation types were thus only recorded within 200 to 300 metres of the calling site.

Of the 23 sites, 20 included improved grass for hay or silage, 16 included grazed pasture and 14 included a burn. Other vegetation types appeared not to be significant. There were four sites that did not include improved grass although there was some tall vegetation for the birds to hide in.

Some sites were in areas of uniform vegetation type e.g. improved grass at Kiells. Others were of very varied habitat e.g. Craighens.

There were areas that appeared suitable for corncrakes in which no birds were recorded. Likewise, calling sites such as Kilchoman appeared very unsuitable.

TABLE 1

SITES OF CALLING BIRDS IN 1986 THOUGHT TO BE BREEDING SITES

The symbols used are as follows:

IG	Improved grass for hay or silage
GP	Improved grazed pasture
RP	Unimproved or old grazed pasture
M	Marsh
SM	Saltmarsh
RB	Reedbed
IB	Iris beds
N	Nettles
W	Woodland or scrub
R	Rushes
B	Burn
RV	Rough vegetation

10 km sq	Site	Date	Time	Calling from:	Nearby vegetation	History
NR15	Portnahaven	15/6	p.m.	?	IG, GP, R, B	1978, 1985
	Portnahaven	various		RP	GP, B	—
	Portnahaven	20/6	2300	IG	GP, R	1972, 1985
NR25	Nereabolls	18/6	2400	RP	IG, N, RV, B	1964 and in last 8 yrs. Not 1985
NR26	Carn	various		IG	GP, RV, B, N	'every year'
	Conisby	14/6	2300	IB	IG, GP, R, B	'78 onwards but not '85
	Coul					
	Coul					
	Coul	various		IG/RV	GP, B	4 from '81 to '85
	Coul					
	Kilchoman	11/6	2300	IB	GP, RP, M, R, B	'81 and '85
	Kilchoman					—
	Ballinaby	13/6	2300	?	IG, M	In last 8 yrs Not 1985
	Ballinaby					Every yr but one in the last 15 yrs. 2 in 1985.
NR27	Craigens	various		N, RV	IG, SM, GP, W, RB	1985.
					IB, B	Last record c. 1976
NR36	Sanaigmhor	various		IG	GP, RV	1985
	Neriby	22/6	1200	IG	GP, B	Uncertain
	Bridgend	various		IG	W	Not 1985
	Eorrabus	various		IG or N	RP, IB, GP, M	In last 8 yrs Not 1985
NR44	Emeraconart	28/6	2400	RP	IG, GP, W	In last 8 yrs Not 1985
						1978
NR44	Lagavullin	25/6	0030	IG	RP, W	1978
NR46	Kiells	various		IG	W	1978, 1985

DISTRIBUTION OF CORNCRAKE SITES ON ISLAY 1986



FIG. 1

Stowe and Tonkin (1985) found that a male's calling position could move up to 100 metres through the season. The present survey was not of sufficient detail to comment on this behaviour but the Craighens bird was calling from a reed-bed in mid-May, moving approximately 50 metres to a nettle patch in early June where it continued to call for the remainder of the season.

Calling activity. Stowe and Tonkin (1985) found that the optimum time for corncrakes to be calling was between 0100 and 0300. It was hoped to visit all potential sites in Islay at least once during June, at these times, to establish the presence or otherwise of calling birds. It was further hoped to visit those sites where birds *had* been recorded a second time to ascertain that a territory had indeed been established.

The above plan proved impossible due to other full-time work commitments but all sites were visited at least once between 2230 and 0300 hrs.

The Craighens site was visited on several occasions through June and the bird was not always calling before 2300 but was always heard on visits later than 0100.

Previous studies have found that only 85% (Henderson 1983) to 90% (Stowe and Tonkin 1985) of males call on any one night of reasonable weather. Some birds may thus have been missed by the single site visits of this study, especially when visits have not been made at the optimum times. For example, a site visit to Sanaighmor (where no corncrakes have been heard for about 10 years) in June found no calling birds, but at the end of the season it was learnt that a bird had been calling there regularly.

At the same time, however, some calling sites have been accepted on the basis of only one visit, so it is hoped that the total of 23 sites recorded in this survey is indicative of the corncrake's true status on Islay.

As with Stowe and Tonkin's findings, there were noticeable differences between the pitch and rate of individual corncrake's calls.

July records. Although previous reports from Uist note regular calling through July, observation in the present study suggest that at least some breeding birds ceased to call in July and calling sites in this month were not necessarily indicative of breeding territories.

A late-night visit to Coul on July 4th produced just one calling corncrake where up to five had been heard regularly through June.

A bird was calling every night at Craighers from late May through June. This bird was not heard after June 25th. Young birds were seen here at a later date, the only sighting of young birds known to this survey.

One of the Portnahaven birds called every night from mid-May to mid-June when it promptly stopped and was not heard again from this site. It is possible that this was due to the bird's death or its movement away from the site.

There is certainly some movement of males (failed breeders?) in late June and July. A bird was heard calling just north of Ballygrant in mid-July where none had been heard earlier in the season.

At Loch Gruinart RSPB reserve, a corncrake was reported calling at Aoradh Farm on June 21st and then 200 metres to the west on June 22nd.

A corncrake was reported, both seen and heard, from the west side of Upper Glen Astle Loch on July 8th and 11th. This is unlikely to be a breeding site.

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Acknowledgements

Special thanks to the Nature Conservancy Council for financial assistance, to Tony Mazur for organising coverage of The Rhinns and to Pixie Gyseman for persevering with the rest of the island.

Thanks also to those others who provided information.

THE ECOLOGY OF THE MINK

BY IAN ROBINSON, UNIVERSITY OF ABERDEEN,
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The American mink *Mustela vison* is a medium sized semi-aquatic mustelid (about the size of a large ferret), with males being about twice as large as females (males = 1.2 kg, females = 0.65 kg). They are usually dark chocolate brown in colour with a white patch on the chin and often on other parts of the ventral surface.

In Argyll mink are found in a variety of habitats, being common along many coastal areas and also by rivers and small lochs. In addition, as mink are not totally dependent on aquatic habitats they may also be found in inland areas.

Indications of the presence of mink in an area, apart from direct sightings, are faeces (scats) and tracks. Mink scats are often deposited on prominent environmental features such as rocks, tree stumps, or at the base of bridges. Otters often defecate at the same sites as mink, but mink scats can usually be distinguished from otter spraints, as they tend to be more cylindrical in shape, being around 4-7cm long and about 1cm or less in diameter. In addition, mink scats have the strong foetid smell often expected from carnivore faeces, whereas otter spraints have a more pleasant sweet and musky smell.

Mink are generally solitary defending a territory against other individuals, especially those of the same sex. Stories of "packs of marauding mink" that sometimes appear in the Press probably relate to a mother and her young, which move around together within the female's territory. Territories tend to be long and thin, following the edges of rivers and lochs. Like many other carnivores, mink spend a lot of time asleep or resting. Dunstone and Birks (1985) found that only about 15% of the day was spent in activity out of the den.

Naturalization of mink in Britain.

Mink are the only alien non-domestic carnivore to have become firmly established in Britain in historic times. They were first imported to Britain for fur farming in 1929, and escaped animals were reported soon afterwards. During the 1950's however, the mink farming industry began to expand considerably in Britain and more mink were imported from American and Scandinavian farms.

The early distribution of mink was patchy, mainly in areas where the number of mink farms was high. From 1962 however, fewer escapes from farms occurred as mink farming was brought under the control of the Mink (Importation and Keeping) Order, made under the Destructive Imported Animals Act. This required that mink could only be kept or imported with a licence. From this time the spread of feral mink continued mainly through the expansion of existing populations (see Lever 1985). In Scotland mink now occupy most of the mainland to the south of the Great Glen, but have a more patchy distribution to the north. Mink are also present on the islands of Arran, Lewis and Harris.

Ecology of feral mink

One of the main reasons for the successful establishment of the mink in Britain is that it is a generalist predator which has filled a broadly based feeding niche unoccupied by any other carnivore. Mink will eat mammals, birds, fish, amphibians and invertebrates, both freshly killed and scavenged as carrion. The proportion of different prey types taken is dependent on availability which varies with habitat type. Birks (1986) compares the major prey groups taken by mink living on a rocky coastline, a lake side, a nutrient rich river and an acid river. Coastal mink ate more mammals and invertebrates (mainly crustaceans) than mink living in the other habitat types, whereas more fish were taken in the acid river site.

Both male and female mink prey on birds in the coastal site, with female predation being slightly greater than that of males. Gulls and waders, *Charadriiformes*, were the most commonly occurring of the bird remains in faeces. Larger species such as Herring gulls, *Larus argentatus*, were most likely to have been taken as juveniles, or as carrion from the strandline of the shore (Birks and Dunstone 1985). Birks and Dunstone (1984) have also shown that some prey remains recovered from mink dens, were those of oiled auks.

Relations with man and other animals.

Mink are a problem in some areas as they can reduce numbers of ground nesting birds, and cause losses to aviculture collections, domestic poultry and fish farms. Losses to stock can be reduced by the use of mink-proof housing or fencing and by strategic trapping at sites at risk. These measures will also keep out other predators such as foxes, stoats and domestic cats. However, it should be remembered that until the 1850's, the polecat, *Mustela putorius*, was present over large areas in Scotland (Langley & Yalden 1977), living in similar habitats to those occupied by mink today (i.e. valley bottoms, river-sides, and marshy areas) (Walton 1977). polecats eat a similar range of prey to mink (with the exception of fish), and also have an impact on domestic stock and ground nesting birds. Thus populations of ground nesting birds may have been at an unusually high level in the years between the extermination of the indigenous Scottish carnivores, and the spread of the mink.

The trapping of mink in a small area is unlikely to be successful as a means of long term reductions in numbers. They are easiest to trap just before and during the breeding season (January-March), when males are very mobile, and also when the young disperse from their natal range. Trapping at these times however, will do little to the total numbers of mink present, (September) since one untrapped male can mate with many females in an area, and there are always more young produced than territories available. The removal of pregnant females from an area may have more effect on the number of mink present, since no young will be produced in that area and females disperse over shorter distances than males (Birks 1986). Pregnant females are however difficult to trap, being very trap-shy, and so are rarely caught. Also, trappers have a tendency to trap at times when more animals will be caught, thinking that this will be of greater benefit. A lot of effort is necessary in order to trap each pregnant female, with little return in the form of corpses per trap night.

Between 1965 and 1970 the Ministry of Agriculture tried to eradicate mink by a campaign of trapping in England and Wales. Over 5000 mink were destroyed in this campaign but by the early 1970's feral mink had been recorded in every county, indicating that the control campaign had been unsuccessful.

The greatest potential threat posed by mink in Britain is the risk of their gaining access to islands used by large populations of colonially nesting birds, which were previously free of mammalian predators. However, otters may also cause problems on offshore islands. In 1985 in some common gull, *Larus canus*, and common tern, *Sterna hirundo*, colonies on islands off the west coast of Argyll, there was evidence of mink predation on birds while otter faeces contained only fish remains. In 1986 however the situation was reversed with no evidence of mink predation on gulls and terns, but all losses due to predation were attributable to otters (J.C.A. Craik pers. comm.).

In conclusion; mink seem to be in Britain to stay, and it is necessary therefore to learn to live with them. While they do cause problems in some areas of Britain, and can cause havoc on predator-free off shore islands, much of their reputation has developed from scaremongering articles in the popular press. A decade of ecological field research has shown that in many areas, mink cause few problems (Birks 1986).

Acknowledgements

I would like to thank Dr. N. Dunstone for his comments on an earlier draft of this paper.

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PREDATION BY OTTERS AT TERN COLONIES IN ARGYLL J.C.A. CRAIK (S.M.B.A., OBAN)

After nearly all the tern chicks in Argyll had starved to death in 1985 (see 1985 Argyll Bird Report), a better breeding season was presaged in 1986. 1156 pairs of common tern and 355 pairs of arctic tern laid clutches at 26 study colonies between Lochailort and Gigha, and there were plenty of young herrings and sandeels in the sea. Perhaps as a result of this abundance, 1986 turned out to be the year of the predators. Mammalian predators struck at the three largest common tern colonies in Argyll (393, 169 and 110 pairs) causing chick mortality of 28, 95 and 100% respectively. Many smaller tern colonies were completely destroyed. The remains of 184 fully grown tern chicks were collected; most had been characteristically dismembered, the head, wings and legs bitten off and the feathered torso eaten. A further 178 chicks died intact after parental desertion in response to this predation, and several hundred small chicks and eggs disappeared completely, presumably eaten whole. Otter spraints consisting of tern chick feathers and bones were found at the two largest colonies, and an otter was disturbed very close to a half-eaten, still living chick. There was little evidence of mink this year. Predation on this scale was not seen at these colonies in 1981-1985, and a count showed that the usual prey of otter, butterflyfish, was not unusually scarce in 1986. Of 22 colonies regularly visited, ten suffered from mild or severe predation by otter or mink, while eleven (mostly the smaller colonies) were unaffected. One common tern colony was deserted during incubation because of regular predation by buzzard(s) on common and black-headed gull chicks on the same island.

INTRODUCTION — FORESTRY AND WILDLIFE

DR. C.A. GALBRAITH

There has been much debate within Argyll in recent years as to the value of planting exotic conifer species on large areas of ground, in relation to financial gain to both the national and local economy. If such gain exists, does this justify the ecological change afforestation brings to planted and surrounding areas? Opinions on the value of forestry tend to differ greatly between interested groups. Foresters tend to think forestry is helpful to the nation, providing jobs in areas where unemployment is high and, of course, producing much needed timber. In their view forestry may not be as ecologically damaging as first seems and may in future become an important wildlife habitat in its own right. Conservationists, however generally view forestry as a disease, spreading over increasingly large tracts of the Highlands, turning the areas into virtual deserts for wildlife. The two sides clearly differ considerably and this has led to sustained and on occasion heated discussion as to the role of forestry as a land use in the Highlands.

The following papers were presented at a meeting on 'Forestry and Wildlife' organised jointly by the Argyll Bird Club and the Cowal Natural History Society and held in Dunoon on 12th April 1986. The aim of this meeting was to bring together all interested parties to explore how co-operative work might help ensure that conservation interests and policies were represented, and practiced in local afforestation plans.

In the first paper of the section, Stephen Tong suggests that much of the economically plantable ground in Argyll has already been planted, hence it is of the utmost importance that management sympathetic to wildlife is carried out on the large areas of land. Rod Leslie's paper outlines the basic choice between whether or not land should be afforested and suggests some of the criteria which may be used to assess the likely effect of planting particular areas of ground. A paper by Phil Radcliffe then follows which details how areas already planted, may be managed in a way that will maximise their wildlife potential. It is to be hoped that many of the techniques described in this paper will be incorporated into forest management in Argyll.

The paper by Roger Broad illustrates that planting land under exotic conifers results in irreversible change to the habitat and that if this occurs on a large enough scale then the populations of many species of bird may be drastically affected. The last paper, by Jeff Watson gives an account of just such an effect, highlighting the decrease in the number of eagles in mid-Argyll over the recent years.

What have we learned from the papers presented and discussion held during this meeting? Clearly, forestry is here to stay, covering much of Argyll with dense plantations of exotic conifers. Within those areas already covered by trees we must strive to ensure that effective conservation policies are implemented. Since the meeting in Dunoon a consultative panel has been established by which the forestry commission consults with conservation and other interested bodies. The Argyll Bird Club is now represented on this panel. This must be seen as a step in the right direction provided that any advice offered to the industry is acted upon.

On areas of land not yet planted but potentially so in the near future, we would ask that the conservation bodies are consulted before any work begins thus hopefully minimising the ecological damage caused by planting. It is hoped that in future the area under new plantation in Argyll will be minimised.

Note: The views expressed in the following papers are of the authors and should not be taken to represent the views or policies of the Argyll Bird Club.

THE NATURE, HISTORY AND EXTENT OF FORESTRY IN ARGYLL

**BY S. B. TONG, ECONOMIC FORESTRY LTD., THE ESTATE
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Forestry, being the management of woodland with the aim of meeting one or a number of objectives, started in Argyll with the management of the remaining semi-natural woodlands, in the eighteenth century to meet the demands of industry for charcoal and tan bark. The basic management method was coppicing and the species used were willow, hazel, alder, ash and oak. The demand for domestic charcoal declined around the beginning of the nineteenth century and much of the native broadleaved woodland became neglected or was cleared for agriculture.

Towards the end of the eighteenth century a low level of planting commenced fuelled primarily by the vogue at that time of bringing exotic tree seed to this country from various expeditions of exploration. During the First World War there was massive exploitation of our woodlands. The war effort nearly foundered due to a lack of timber, and in 1919 the Forestry Commission was formed with the remit of establishing a strategic forest resource. This they did by purchasing and planting private estates, which practice continues to the present day.

Some twenty years ago the predominance of old private estates and the Forestry Commission was taken over by new private forestry investment undertaken for financial return by individuals, trusts and pension funds. Argyll's current forest estate is split fairly equally between the state and private sectors, with the private sector owning the majority of younger plantations.

The extent of forestry in Argyll is currently 150,000 — 200,000 hectares, representing 27%–36% of the total surface area of 550,000 hectares, including water. Discounting water and high ground unsuitable for planting, this is a considerable proportion of the plantable area already under forest. This fact is reflected in the gradual decline in the levels of new planting in Argyll in recent years.

Most plantations are coniferous, the predominant species being Sitka spruce with eight or so other conifer species, such as pines and larches, being used to a lesser extent. They are generally situated on hillsides and steeper valley bottoms less suitable for agriculture, but generally stop short of the exposed hill tops.

Until recently, the typical Argyll plantation was an even aged monoculture, laid out in large blocks with regular, often straight line, boundaries. This layout, while not the visual and ecological disaster supposed by some, is lacking in diversity and not particularly pleasant to behold. The most important thing to note is that we do not plant forests like that any more, and most forestry concerns have not done so for a number of years.

All new plantings are designed in shape and species composition, to blend with and enhance the beauty of the landscape. All existing broadleaves are retained and a broadleaved element is included in the planting. Planting is kept clear of water courses, rock outcrops and other features of interest. Environmental impact is reduced by undertaking less ploughing in favour of more sympathetic forms of ground preparation.

A considerable proportion of Argyll's woodlands are now reaching maturity, being felled and restocked. The same criteria of design are used in restocking as new planting, but yet greater diversity of species, habitat and age is introduced by the very nature of the operation. Restocking takes considerably longer to establish than new planting and the resultant forest is more of a patchwork, often containing an element of natural broadleaf regeneration such as birch, alder, oak and rowan.

The total forest area of Argyll is unlikely to increase dramatically over the coming years, but as the recent plantings grow on there will be overall improvement in landscape and conservation value of the woodland resource. For more than a century it has been widely recognised that the soils and mild, damp climate of Argyll is particularly well suited to growing coniferous tree species. As the area of mature woodland increases the social and economic benefits accruing from it will do likewise and forestry will be recognised as the most significant land use in the area.



NEW AFFORESTATION AND BIRDS

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Afforestation of open hill land results in a dramatic change in avian fauna from a moorland to a forest community. Although many open land species can return to forest after clear felling some cannot and the loss of their habitat is permanent. It is concern for these species, which include Greenshank, Golden Plover, Dunlin and Merlin, which is the basis for the increasing concern of conservationists over new afforestation.

Some species may be accommodated in the forest through careful design such as leaving small open areas. Others, however, cannot and it must be clearly understood that there is a fundamental difference between whether or not afforestation should take place and the detail of how that afforestation is designed.

Importance of a species is based on our perceived value of it: this is generally a combination of its rarity and attractiveness. Thus a Meadow Pipit is considered of lower value than a Golden Plover both because it is more common and less attractive in appearance. Increasingly the value of the rarer forest birds is appreciated but species of the original habitat type are always likely to be considered of higher value. Thus in the analogy of Greenshanks replaced by Goshawks following afforestation there may be some gain in conservation value as the first Goshawks only replace a small part of the Greenshank population. However, as Greenshanks decrease, the overall conservation value declines and no number of Goshawks can compensate for the loss of the last Greenshank.

From this, one may propose some generalisation. First: the loss of a small part of any population is not necessarily the major conservation problem it is sometimes portrayed. Second: no species should be reduced by forestry to the extent that its British population becomes threatened. How much reduction a species can tolerate will depend largely on its rarity: a loss of 10-15% of Greenshank or Chough might be too much whilst 20% of the far more numerous and widespread Golden Plover population might be acceptable. Most species, however common, should not be drastically reduced (say by more than 60%) of its national population.

How might these ideas apply to particular bird populations? Golden Eagle are widespread. They are known to be adversely affected by concentrated afforestation but in Argyll and Galloway only a small part of the total British population is affected. However, the population as a whole is likely to be affected by the general level of afforestation and it would probably be quite easy to estimate the likely effects of differing levels of afforestation by comparing ITE forestry capability maps with eagle census maps.

In contrast, Greenshanks are concentrated in a smaller area and should even a proportion of the present national planting programme take place there it could cause a rapid population decline. The third example, of Merlin in Wales, illustrates that there are factors other than forestry at work in the uplands, which influence bird populations. Whilst forestry can effect Merlin it has been shown that the main reason for its current decline in Wales is the conversion of heather moor to grass through over grazing or reseeding.

Both foresters and conservationists need a clearer understanding of how habitat change affects birds. A system that compares values and describes limits, as suggested above, will benefit foresters by clearly showing what actions are likely to be unacceptable and also conservationists by clearly identifying priorities and avoiding the risk of a reduced impact to their message through frequent cries of wolf.

THE MANAGEMENT OF UPLAND COMMERCIAL FORESTS FOR BIRDS AND MAMMALS

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This paper summarises a more complete treatment of the subject by P. R. Ratcliffe & S.J. Petty, published in: *Trees and Wildlife in the Scottish Uplands*, Edited by D. Jenkins, ITE. 1986.

1. Introduction

Commercial forests in the British uplands are mainly concerned with the production of fast growing, small diameter spruce and pine. The age at which crops are felled is governed primarily by the increasing risk of windthrow with increased height and by economic constraints. Forests are zoned according to their susceptibility to windthrow, the sites most at risk being managed under a "no-thinning" regime. A major consequence of short-rotation forestry is that very large areas of forest are always in the early-growth stages (Ratcliffe 1985a) (Figure 1).

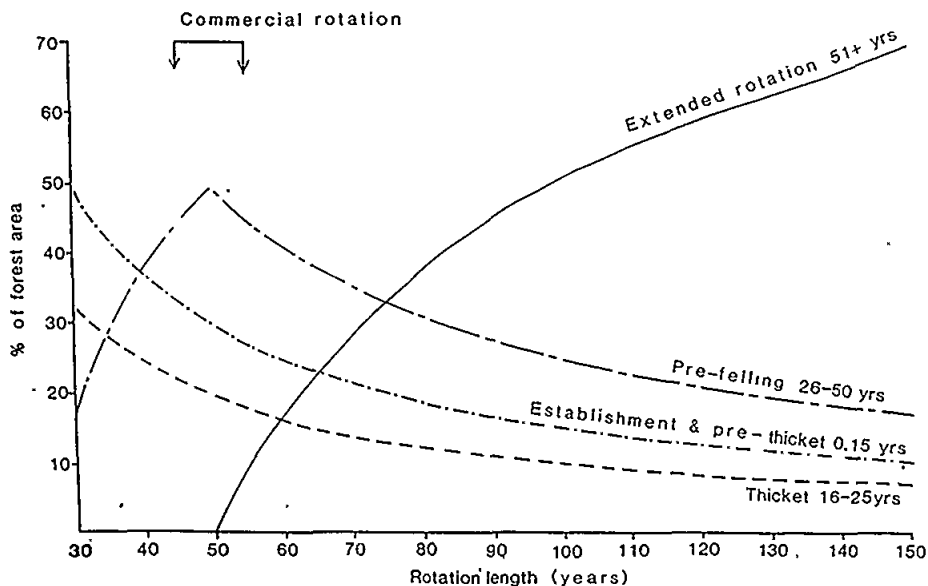


Figure 1. The influence of rotation length on the proportion of different sequential growth stages, based on yield class 12 Sitka spruce.

2. Sequential Growth Stages of Conifer Forests

Foresters have loosely defined different growth stages in commercial forests. Moss *et al.* (1979) used these to catalogue the successive changes in song-bird populations and Ratcliffe *et al.* (1986) re-defined them to aid the management of red deer (*Cervus elaphus*).

The changing area occupied by each growth stage through time affects most wildlife species in some way and provides valuable data on which to base the predictive management of commercial forest ecosystems. The interface between each stage can be easily re-defined to suit studies of particular wildlife species or communities, and the application of computer models (Ratcliffe *et al.* 1986) can provide rapid tabulated and graphical output describing future changes in forest structure (Figure 2) and associated wildlife numbers. To examine the effects of sequential changes in the growth of forests on groups of species having widely differing requirements, we can define these stages (Figure 3), as a means of estimating changing levels in resources (Figure 4).

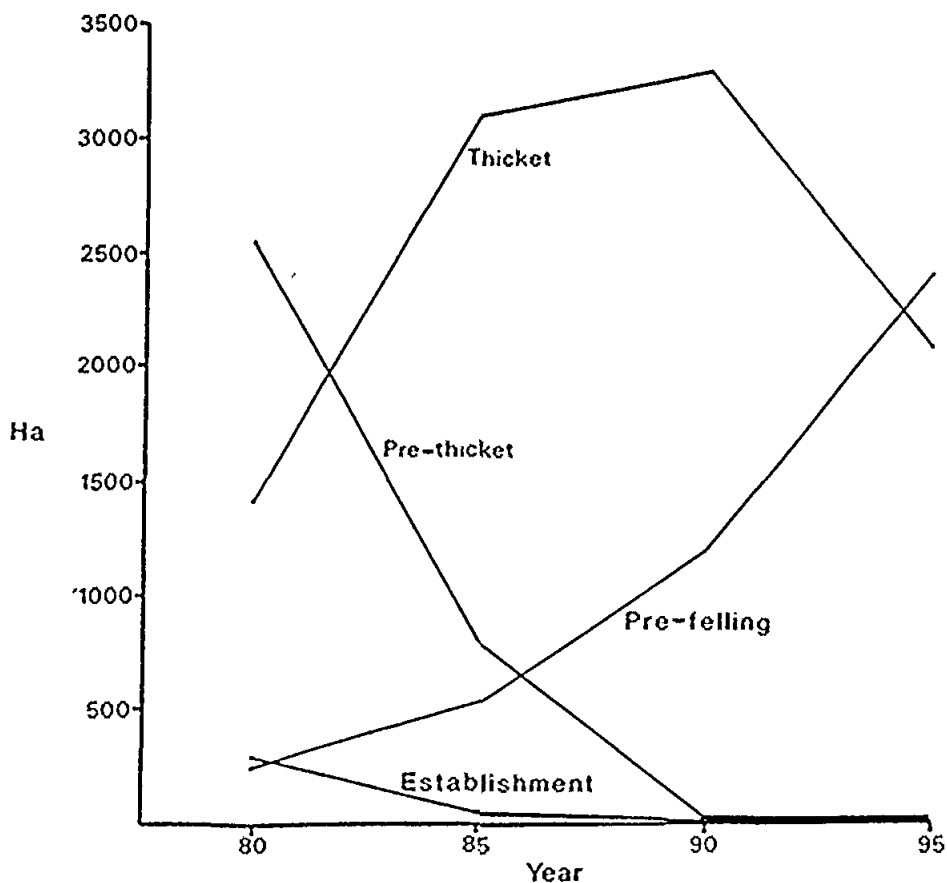


Figure 2. Predicted changes in sequential growth stages at Glenorchy Forest, Argyll (From Ratcliffe *et al.* 1986.)

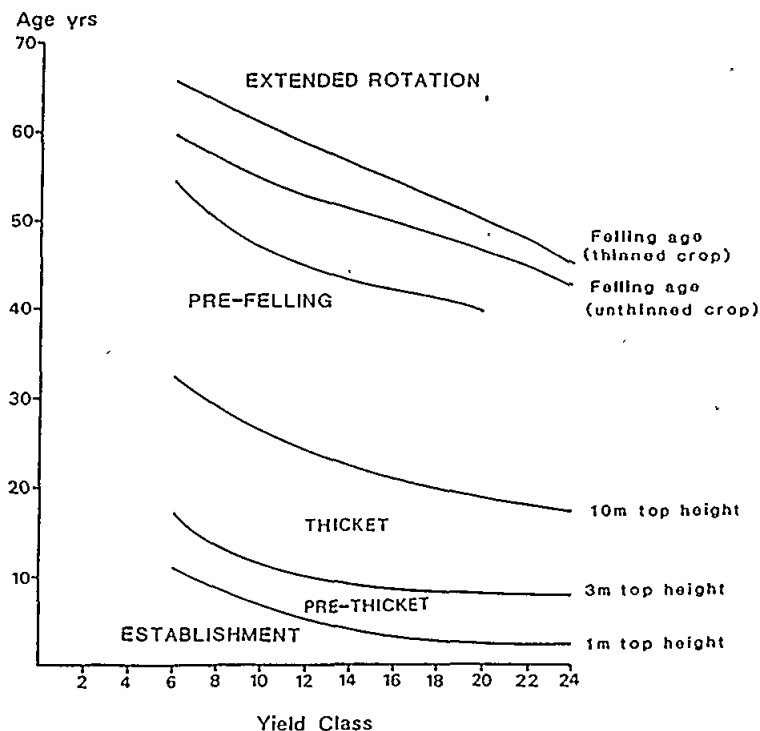


Figure 3. Model of sequential growth changes in Sitka spruce forests (from Radcliffe *et al.* 1986.

Sequential growth stage / Food source	Establishment	Pre-thicket	Thicket	Pre-felling	Extended rotation	Re-establishment
Ground vegetation invertebrates	○	○	•	•	•	○
Small mammals	○	○	•	•	○	○
Tree canopy invertebrates	•	•	○	○	○	•
Conifer seed	•	•	○	○	○	•
Forage for deer	○	○	•	•	○	○

From the least to the most available food • • • ○ ○ ○

Figure 4. The availability of major food resources in relation to sequential growth stage.

2.1 Establishment

Moorland is usually ploughed to achieve cultivation, drainage and weed suppression and phosphate is normally applied. Trees are planted at a density of about 2000 per ha, regularly spaced at approximately 2m x 2m. Domestic grazing stock are usually excluded and in about 55% of afforested areas, mainly in north and central Scotland, red deer are also excluded by fencing (Ratcliffe 1984a). These establishment techniques inevitably result in an increase in vegetation which in turn leads to an increase in the numbers of small rodents (Charles 1981), and their mammalian and avian predators, such as the fox (*Vulpes vulpes*), wild cat (*Felis silvestris*), weasel (*Mustela nivalis*), short-eared owl (*Asio flammeus*) and kestrel (*Falco tinnunculus*) (Newton 1983; Staines 1983). Temporal cycles in the abundance of field voles which are unrelated to forest succession also modify predator-prey interactions during the establishment phase. The abundance of prey attracts less widely distributed species such as the long-eared owl (*Asio otus*) and barn owl (*Tyto alba*), if suitable nest sites are available (Newton 1983), and has led to increases in some rare species such as the red kite (*Milvus milvus*) in central Wales (Newton *et al.* 1981), and the hen harrier (*Circus cyaneus*) throughout the uplands (Watson 1977). Following afforestation, some moorland song-bird populations increase in density while others are lost (Moss *et al.* 1979). Species favouring scrub habitats such as whinchat (*Saxicola rubetra*), redpoll (*Carduelis flammea*), and willow warbler (*Phylloscopus trochilus*), also increase in numbers, though these species are absent prior to afforestation and in the older growth stages (Figure 5).

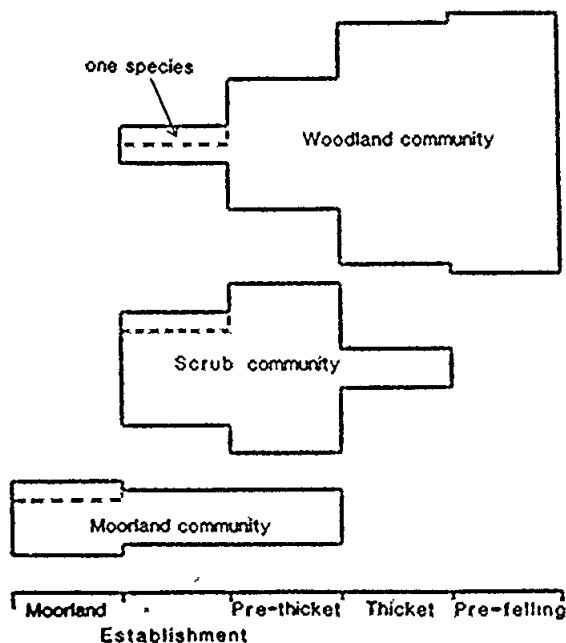


Figure 5. Changes in song-bird community structure resulting from afforestation of open moorland (adapted from Moss *et al.* 1979).

A wide variety of forbs appear during the early years (Hill 1979) and roe bucks (*Capreolus capreolus*) colonise and establish territories at this stage, followed later by does. When red and roe deer have not been excluded, they will make substantial use of these areas for feeding and it is likely that there will be a marked loss in plant diversity at densities as low as 3 red deer/km² (Kraus 1985) compared to densities of 5-40 km² in Scottish forests (Ratcliffe 1984a and b). The presence of domestic ungulates, particularly sheep, adds to this problem.

2.2 Pre-thicket

In the pre-thicket stage, trees reach a height of about 1-3m. Browsing by deer on the commercial tree crop diminishes, and a degree of cover is provided for roe deer (Staines & Welch 1984). Red deer will use these areas, but as cover is below optimum, and their increase in numbers is slower, they seldom achieve the densities of roe deer (Ratcliffe & Rowe 1985). Mammal and bird predators continue to feed on field voles, and many of the moorland birds will have been replaced by an increasing number of species associated with young conifers. True woodland birds such as goldcrest (*Regulus regulus*), coal tit (*Parus ater*), and chaffinch (*Fringilla coelebs*), also become established (Figure 5).

2.3 Thicket

At this stage, tree height is between 3-10m and canopy closure occurs. When light intensity begins to fall, a decline in the abundance of vascular plants commences (Hill 1979), and ultimately under dense, vigorously growing conifers, ground vegetation is completely eliminated except along road, ride and streamsides. These may together account for about 15% of the forest area. However, very large areas of uniform growth are uncommon, and by the thicket stage, many forests have developed an uneven height and density (structural diversity) due to local variations in site quality. This results in small vegetated glades within thickets, which, due to the close proximity of food and shelter, support the highest densities of red deer found in Great Britain (Ratcliffe 1984). Subsequently in the later thicket stage, roe deer appear to decline (Staines & Welch 1984).

Woodland song-birds will have completely replaced their moorland counterparts (Figure 5), but a few scrub species persist in glades, together with forest edge species such as the tree pipit (*Anthus trivialis*) (Moss *et al.* 1979).

All the raptors associated with the previous stages, which depend on open conditions for hunting, will have now disappeared, and trees in the thicket stage are too small or too dense to allow access for breeding by woodland birds of prey such as the sparrowhawk (*Accipiter nisus*), (Newton *et al.* 1977) and tawny owl (*Strix aluco*), (Petty unpublished data).

2.4 Pre-Felling

Tree height is from 10m up to that predicted at the age of felling (Figure 3). Crops gradually become more open as suppressed trees die and thinning and windthrow occur. A limited ground vegetation usually returns, but it is of low quality for herbivores. Deer use this stage less than any other, though roe deer can maintain low densities as the vegetation starts to re-colonise (Staines & Welch 1984). Passerine populations are dominated by species which feed on invertebrates in the canopy with goldcrest and coal tit reaching their greatest density, while the lightly vegetated forest floor provides both foraging and breeding sites for woodcock (*Scolopax rusticola*), robins (*Erithacus rubecula*) and song thrush (*Turdus philomelos*) (Moss *et al.* 1979). Coniferous trees may produce heavy cone crops and as trees mature and crown volume increases, the potential for higher cone production also increases. Conifer seeds provide a rich food source for common crossbill (*Loxia curvirostra*), and siskin (*Carduelis spinus*), 2 species which are specially adapted to utilise this bonanza (Newton 1972), and which have greatly expanded their range in Britain as a result of the expansion of commercial forestry (Sharrock 1976). High densities of crossbills and siskins provide abundant prey for sparrowhawks in early spring when other forest passerines are scarce and when sparrowhawk productivity attains high levels (Petty 1979, & unpublished data). The increasingly open structure of the forest enables sparrowhawks to hunt and allows access for breeding. Red squirrels (*Sciurus vulgaris*) are also largely dependent on conifer seed for food and may colonize commercial forests at this stage (Tittensor 1975).

2.5 Extended rotation

This stage continues beyond the usual age of felling based upon economic constraints and windthrow risk, and seldom occurs in British commercial forests (Figure 3). However, it is a stage which has important benefits for the conservation and management of birds and mammals (and presumably for other vertebrate groups and invertebrates). The management option of maintaining extended rotations is discussed later.

2.6 Re-establishment

Re-establishment or re-stocking of trees usually follows clear felling but can occur prematurely following the clearance of windblown areas. It involves the planting of trees amongst the stumps and branches left from the previous crop.

The size of felled areas depends upon economic and environmental considerations (Low 1985), but they are usually much smaller than areas being planted for the first time. Deer utilise these areas similarly to the establishment phase but in small areas where cover and food are close at hand, red and roe deer usage can be very high. On larger sites, red deer use the central areas, far from cover, less heavily than the edges (Thirgood 1984). The developing plant communities are unlike those prior to afforestation, and the species present depend on soil type, seed sources and grazing pressure. In North Wales, in the absence of deer, rich soils were colonised by broadleaved tree seedlings and forbs. This resulted in a diverse scrub layer which supported a diverse bird community, including willow warbler and wren (*Troglodytes troglodytes*) and the less common, blackcap (*Sylvia atricapilla*), whitethroat (*S. communis*), and garden warbler (*S. borin*) (Currie & Bramford 1981; Bibby *et al* in press a). In Northumberland, where selective feeding by roe deer eliminated broadleaved plants, and a grassy vegetation resulted, the bird community was similar to that present on newly afforested sites, with meadow pipit (*Anthus pratensis*), the most abundant species (Leslie 1981). Site quality may affect the response of particular plants to browsing (Burdekin & Ratcliffe 1985) and hence may modify vegetation composition. Field vole populations fluctuate on grassy sites (Petty unpublished data), and short-eared owls may be attracted to the largest of these (Leslie 1981). Tawny owls become established in the surrounding forest, increasing their productivity in response to the periodic abundance of vole prey (Petty 1983).

3. Spatial Diversity

In addition to the temporal changes described, the spatial aspects of commercial forests are also important. Afforested areas usually succeed each other annually in a step-wise fashion across land acquisitions, resulting in a fairly uniform monoculture of conifers. Large areas of uniform spruce crops with low diversity can support only the restricted wildlife associated with that particular growth stage.

However, with the recent attainment of completed commercial rotations in many areas, crops have been felled and new areas re-established resulting in an increased spatial diversity which may be further increased by windthrow, creating an intimate mosaic of stands of different ages. This is an important characteristic of second rotation forests and has innumerable benefits to wildlife, but it can also increase the carrying capacity for deer still further.

4. Habitat Improvements

Benefits to wildlife following afforestation have usually occurred fortuitously and many more improvements are possibly by careful, planned management. Prescriptions should include the management of important sites, the requirements of particular species, and the diversification of the remaining forest (Smart & Andrews 1985). Specialist organisations such as the Forestry Commission, (FC) Institute of Terrestrial Ecology, Nature Conservancy Council, Royal Society for the Protection of Birds, and local naturalist organisations, may be able to provide information on the presence of important species or habitats and on their subsequent management.

4.1 Tree Species

Commercial forestry aims to plant the most profitable species on a particular site type. In the uplands, this often leads to Sitka spruce (*Picea sitchensis*), being the most widely used species. The tree species used is of less importance, for example to bird communities, than is the ensuing structure of the forest (Moss 1978), though spruce is usually richer for birds than pine or larch (Newton 1983). Some structural diversity will develop in extensive, relatively even-aged, plantations due to variations in aspect, drainage and nutrient status, but this can be increased considerably by the use of other species in groups or in mixtures.

The recent introduction of a new broadleaved woodland policy by the FC has provided a much needed stimulus to secure a place for broadleaves within all commercial forests (Forestry Commission 1984). Although this policy is not confined to native species, many upland sites will

not profitably grow broadleaved crops. Indigenous species have greater conservation benefits and we suggest therefore that these should be the only broadleaves planted on such sites i.e. sessile oak (*Quercus petraea*), alder (*Alnus glutinosa*), birch (*Betula pubescens*), rowan (*Sorbus aucuparia*), holly (*Ilex aquifolium*), aspen (*Populus tremula*), bird cherry (*Prunus padus*), and goat willow (*Salix caprea*). Additionally, ash (*Fraxinus excelsior*), wych elm (*Ulmus glabra*), and hazel (*Corylus avellana*) could be encouraged or planted on well-drained base-rich soils. Native conifers are equally important and should also be encouraged or planted on suitable sites. An extension of the use of Scots pine (*Pinus sylvestris*), rather than Lodgepole pine (*P. contorta*), or Sitka spruce, will assist the spread of species associated with native pinewoods (Bunce & Jeffers 1977). The crested tit (*Parus cristatus*), for example, has extended its range, albeit at lower densities, into the pine plantations on the northeast coast of Scotland (Cook 1982) and the capercaillie (*Tetrao urogallus*), has extended its range still further into areas of mixed woodland (Sharrock 1976). Bark-stripping damage by red deer is much less severe on Scots pine than on the faster growing lodgepole pine. This, in addition to other wildlife benefits, seems a justifiable reason for planting it in preference to lodgepole pine in some areas.

All areas of ancient or semi-natural woodland should be retained and if possible expanded. These areas, if large enough, will support their own distinctive wildlife (Lowe 1977; Newton & Moss 1977; Fuller 1982). Additionally, many areas of the uplands support broadleaved trees, particularly birch, which have established themselves naturally, either on moorland or within conifer plantations. The planting and/or retention of native trees both in pure crops along road or stream-sides or interspersed throughout plantations provide immense benefits to wildlife. Biddy *et al.* (in press b) have shown that single broadleaved trees and small groups scattered through conifer crops will encourage some rarer song-birds not normally found in conifer plantations, while Newton and Moss (1981) demonstrated that pine/birch mixtures supported higher densities of song birds than pure pine crops. In non-commercial broadleaved areas, there is no reason to create densely stocked plantations, the aim being to re-create native woodland conditions with glades and irregular spacing.

The presence of broadleaves will provide seed sources and the potential for natural regeneration at the re-establishment phase. Many upland sites will readily grow birch and a limited range of other native species. Birch can be difficult to transplant and direct sowing of seed on to previously cultivated sites lacking adjacent seed sources may be a useful alternative (Brown 1983). Birch reverses podzolisation and acidification accentuated by conifers and there may be important silvicultural benefits to be gained from birch/conifer mixtures (Miles 1981).

Among the broadleaves the relatively low palatability of birch to herbivores (Bobek *et al.* 1972; Mitchell *et al.* 1982) is an advantage, though it may require protection in some areas when deer densities are high (Lowe 1977; Miles & Kinnaird 1979).

4.2 Extended rotations

The absence of this mature stage in British commercial forests reduces the carrying capacity of the habitat for birds and mammals characteristic of climax forest ecosystems. A provision allowing at least a small proportion of commercial crops to continue beyond normal rotation age, with some being left to reach biological maturity, would greatly enhance conditions for wildlife (Bunce & Jeffers 1977; Currie & Bamford 1982a).

The natural thinning or removal of tree stems allows more light to penetrate the canopy with a consequent increase in vegetation. Indeed, it is the presence and development of glades and both a field and shrub layer which benefits a large variety of birds, including wood warbler (*Phylloscopus sibilatrix*), spotted flycatcher (*Muscicapa striata*) and redstart (*Phoenicurus phoenicurus*) (Currie & Bamford 1982a.) These species are more frequently found in mature broadleaved woodlands in Britain (Fuller 1982) but they also occur in mature conifer forests in northern Europe (Haapanen 1965, 1966). The open nature of this habitat provides suitable flying conditions for bats and some raptors.

Older trees produce more cones and therefore will support more red squirrels, crossbills, and siskins. Pines produce cones regularly, providing a steady, dependable food supply, while cone crops from spruces are irregular and unpredictable. Rejala and Lampio (1963) showed that heavy spruce and pine cone crops alternated, perhaps as a consequence of the dependence of flowering of both species on similar weather conditions, but with spruce cones maturing in the same year and pine a year later (Moller 1983).

Squirrels feed much more efficiently on spruce than on pine, due to the higher calorific value of spruce seeds and to the relative ease of stripping the spruce cones (Danilov 1938), and there is abundant evidence that red squirrels prefer spruce cones over pines (see Moller 1983 for a review). However, most of this work was done in mixed Norway spruce and Scots pine forests in continental Europe, where it is relatively easy for a sedentary animal to switch from the dependable but less nutritious food supply of pine seed, to the sporadic but more nutritious supply of spruce seeds in years of abundance. In Scotland, where spruce and pine tend to be more segregated, red squirrels in pine forests cannot always take advantage of the irregular bumper crops of spruce seeds nor can the low density populations in spruce forests make use of the dependable crop of pine seeds. In contrast, birds like common crossbills and siskins are highly mobile and can move long distances to exploit the irregular spruce cone crops. The conservation of red squirrels may be dependent upon increasing rotation length to provide larger biomasses of conifer seed, but it seems likely that mixtures of pines and spruces would also provide considerable benefits.

Only 4 species of bat are recorded in any numbers in Scotland; these are Natterers (*Myotis nattereri*), Daubenton's (*M. daubentoni*), pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared (*Plecotus auritus*) all of which are to some extent dependent on trees for roosting and which feed in open woodland. Extended rotation forests with large dead trees, woodpecker holes or the provision of bat-boxes to simulate natural roosts, will almost certainly lead to an increase in these species (Stebbins & Walsh 1985).

With extended rotations, a smaller proportion of the forest will be occupied by the younger sequential growth stages (Figure 1). One consequence of this is a reduction in the overall carrying capacity of deer (Ratcliffe 1984b), an important benefit considering the great difficulties currently experienced in controlling deer populations (Ratcliffe 1984a, 1985b; Ratcliffe & Rowe 1985).

4.3 Felling coup size

Decisions on the size of areas to be felled provide an opportunity to modify the spatial diversity of forests. It is often unwise to perpetuate the large even-aged blocks created in the first rotation, and the opportunity should be taken to increase spatial diversity with the creation of a mosaic of blocks of different ages (Hibberd 1985). The use of natural features and roads for the boundaries of felling coups will avoid conflicts with landscaping objectives and reduce the risk of windthrow at the edges of standing crops. The retention of even small groups of trees on felled areas will improve the site for birds (Currie & Bamford 1981, Bibby *et al.* in press a).

Bibby *et al.* (in press a) showed that the composition of song bird communities on re-establishment sites in Wales was unrelated to area. They also found that song-bird density decreased adjacent to thicket stage conifers but not when adjacent to broadleaves, open areas or pre-felling stage conifers. Small felling coups provide a high edge to area ratio, and this may sustain higher numbers of some song-birds. In Sweden, forest bird density increased near the edge of felled areas (Hansson 1983). Large felling coups may be more attractive to some larger and scarcer species, such as curlews (*Numenius arquata*) and short-eared owls (Leslie 1981) while kestrels may breed in old crow nests near the edges of felled areas and exploit the increased abundance of voles (Petty 1985). Hen harriers have bred recently on re-establishment sites (Petty unpublished data). A range of felling coup sizes will provide and perpetuate a dynamic spatial diversity which will support a wide range of wildlife species.

The less intensive use of large re-establishment areas by red deer (Section 2.6) suggests opportunities to restrict browsing damage by only felling and replanting large areas. Unfortunately, this conflicts with the requirement for at least some smaller coups to enhance bird diversity.

4.4 Deer control

Selective grazing by high densities of deer causes damage to commercial tree crops and drastically reduces botanical diversity (Kraus 1985). Native red deer are hybridizing with Japanese sika deer (*Cervus nippon*) in some areas, creating a threat to the genetic purity of red deer (Lowe & Gardiner 1975; Harrington 1982; Ratcliffe unpublished data). The spread of sika deer is related to the expansion of commercial forestry, and this raises the question of creating unafforested sanctuaries for native red deer. High densities of deer in upland forests are undesirable

and pose difficult problems which should be anticipated at the afforestation and re-establishment stages, and sites for high seats (Rowe 1979) and deer control clearings or glades should be selected before planting. These should usually be 0.2-1.0 ha in extent, and be well distributed throughout the forest, selecting if possible areas naturally favoured by deer (Ratcliffe 1985). Glades should be sited so as not to conflict with landscape design. Indeed, they may be beneficial both to landscaping and to wildlife conservation.

4.5 Streams, lochans and bogs

In order to reduce acidity and generally improve water quality, conifers should not be planted close to stream sides (at least 5 times the stream width on either bank) (Mills 1980). Groups of broadleaves, such as alder, bird cherry, ash and willow will further enhance these areas for wildlife. Lochans and bogs provide attractive areas for a number of birds, including divers and waders. Dense plantations closely surrounding these, may result in the loss of fly-ways for divers and provide cover for nest predators, such as crows (*Corvus corone*) and foxes. Otters (*Lutra lutra*) will benefit from riverside trees, particularly ash and alder, and from dense vegetation along riversides. King and Potter (1980) provide recommendations for otter conservation and it may be possible to encourage them further by providing artificial holts (Elliot 1981). Virtually all species of bats have recently been shown to be dependent upon water, and even permanent small pools will provide flight areas and an abundance of flying insects for them (P.A. Neville unpublished data).

4.6 Steep banks and crags

These features provide important nesting areas for many raptors, including merlins (*Falco columbarius*), kestrels, peregrine falcons (*F. peregrinus*) and golden eagles (*Aquila chrysaetos*). Many such features occur close to water courses and can be effectively incorporated by extending these unplanted places. Crags which are isolated by plantations should remain unplanted on the downhill side for a distance of at least twice the height of the crag, including any steep ground at the base. This distance will depend on the adjacent landform and should be large enough to provide unrestricted access by birds onto the crag when the trees have reached their full height.

4.7 Other topographic features

These include old buildings which provide nest and roost sites for swallows (*Hirundo rustica*), barn owls, kestrels and bats, small open areas such as those used traditionally for display by black grouse (*Tetrao tetrix*), and badger (*Meles meles*) setts. Unplanted areas around these sites may encourage their continued use and badger gates in fences will allow badgers to move freely without causing damage (Rowe 1976).

4.8 Artificial nest sites for birds

When an absence of natural nest sites is thought to limit the presence or control the density of birds, artificial nest sites may improve the situation.

Nestboxes suit a wide range of cavity-nesting song-birds (Du Feu 1985) and the density of pied flycatchers (*Ficedula hypoleuca*) and tits can be dramatically increased by their use in broadleaved and mixed woodland, and in conifers adjacent to these areas (Currie & Bamford 1982b). However, nestboxes for song-birds in spruce plantations appear to be little used, perhaps because the coal tit is the only cavity-nesting species present and this appears to be dependent on ground holes (Currie & Bamford 1982b). Large boxes will provide barn owls with suitable nest sites in derelict buildings which lack suitable nesting ledges (Du Feu 1985), while tawny owls in coniferous forest will almost completely abandon natural sites in preference for nestboxes (Petty 1983), though this may not be desirable. Although kestrels readily used nestboxes in Holland (Cave 1968), they did not do so in newly afforested and re-established sites in Wales and NE England (Petty 1985). Kestrels and long-eared owls bred in artificial crow nests sited in old shelter belts scattered throughout a newly afforested area in south Scotland (Village 1981, 1983). Large boxes sited along the forest edge adjacent to lochs and rivers have been used successfully by goldeneyes (*Bucephala clangula*) (Dennis & Dow 1984) and goosanders (*Mergus merganser*) (Petty unpublished data). Large trees supporting the nests of buzzards (*Buteo buteo*) and

goshawks (*Accipiter gentilis*), and some trees with large supportive whorls of branches should be retained, as nest sites are often scarce in plantations of conifers. Saurola (1978) constructed artificial platforms which were used by goshawks and larger platforms can provide nest sites for golden eagles and ospreys (*Pandion haliaetus*).

Rafts providing undisturbed nest sites can be floated in lochs when disturbance or changing water levels are affecting the breeding of waterfowl. These have been successfully used for divers (*Gavia* spp.) (Merrie 1979), and may be used by other waterfowl.

4.9 Dead wood

Dead trees, particularly large ones, provide some birds with nest sites and an important supply of invertebrate food and should only be removed if this is necessary to control the spread of fungal or insect pathogens. Conifers do not develop natural holes as readily as broadleaves. Holes excavated by woodpeckers are important and their absence may limit the presence of other hole-nesting birds. Pines and broadleaved trees support more of the larger wood-boring beetles favoured by great spotted woodpeckers (*Dendrocopos major*) and consequently their density is often low in spruce forests. Many wind-snapped and windthrown trees in upland forests are particularly valuable in providing nest sites for redstart and spotted flycatcher, while both these species and song thrush, blackbird (*Turdus merula*) and wren, nest in the root plates of windthrown trees.

7. Summary

This paper describes the wildlife of different growth stages of newly planted forests, showing how moorland species are gradually replaced, through the pre-thicket and thicket stages by a predominantly woodland community. The younger and older growth stages hold the most diverse wildlife communities, in contrast to the thicket stage. The effects of second generation forests on wildlife are discussed, and it is suggested that these may be similar in subsequent rotations. Modifications to current forest management practices are proposed which will greatly enhance upland forests for birds and mammals, our aim to increase both the spatial and structural diversity of even-aged forests. These involve not planting conifers close to important habitats, such as watercourses and ancient woodlands, the planting and maintenance of native tree species, the careful design of felling coups, and the extension of conifer rotations. The benefits gained from providing artificial nest sites for birds are discussed. The beginning or end of the rotation is the most opportune time to exercise management modifications. Future research should concentrate on a multi-disciplinary approach to a wider range of species. Active management is necessary to ensure that upland forests become diverse ecosystems which complement the magnificent scenery among which we choose to plant trees for commercial gain.

7. Acknowledgements

I thank Ian Newton and Roderick Leslie for their constructive comments on an earlier draft of this paper, John Williamsons who drew the figures, and Lena Birchall for typing successive drafts.

8. References.

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UPLAND BIRD COMMUNITIES AND FORESTRY IN ARGYLL BY R.A. BROAD, R.S.P.B., 6 BIRCH ROAD, KILLEARN, GLASGOW, G63 95Q.

It is important to make clear what is meant by 'upland'. The word itself can be misleading and is best explained by describing its physical characteristics. Typically in Argyll this includes unproductive areas with acidic soils derived from underlying hard, ancient rocks, such areas have low average temperatures, average windspeeds and high levels of rainfall.

The combination of these factors in N and W Scotland produce 'uplands' at low altitude, sometimes even down to sea level. The harsh conditions and the upland character are recognised agriculturally with the majority of Argyll designated a less favoured area (LFA). Forestry has expanded in such areas and become a major land use throughout Argyll over the last 20-30 years. It is difficult to look at the effects of afforestation on upland bird communities in isolation and it should be remembered that sale of upland for afforestation can and has provided capital in some places, for the intensification of agriculture on adjacent areas. The previously existing nature conservation interest is therefore squeezed from two directions, from accelerating afforestation and from intensification of agriculture, which together leave less room for wildlife.

Nature conservation and wildlife should be viewed as an important resource, particularly in Argyll where tourism is a major element in the local economy and a supporter of rural communities. Unfortunately the true value of nature conservation cannot be quantified in the same way as either forestry or agriculture. However with growing public concern over agricultural surpluses and over the economics of forestry in some apparently unsuitable areas, there is an urgent need to think both long and hard about the effects of afforestation in Argyll in the long term. This applies both to new plantings and to the existing extensive plantations. In some areas of Argyll there is no ground that is too high to plant, and indeed huge tracts have been planted without interruption, especially in Mid-Argyll and Kintyre. Elsewhere, eg in Mull and North Argyll, steep-sided glens have been planted with complete ribbons along the 'middle ground', effectively separating the higher tops from the valley bottoms. Such changes can have far-reaching consequences for the bird communities of the area.

Many of the upland bird species typically live at very low densities and are scattered over very wide areas. Consequently they require very large areas for their survival, and are not readily safeguarded by the designation of Sites of Special Scientific Interest (SSSI). The total replacement of open upland habitat by conifers is catastrophic for many species and the fragmentation of the remaining moorland blocks into smaller, widely scattered areas can also be seriously detrimental to the success and viability of those birds that remain. Within Argyll it is a pointless exercise to speculate on what has already been lost in conservation terms to forestry as there is little prior survey work to quantify the bird communities. Some areas will have been at least of local or regional importance; others, especially where previous land use had resulted in serious impoverishment through overgrazing and repeated overburning, will have been of lesser interest. 'Upland' covers a wide range of subtly different habitat types which, in total, support a wide range of bird species. In the UK, ten bird species have been identified as typical of upland areas, although not all will necessarily occur together. Within Argyll some are obviously more important than others, and there are additionally a number of specialities peculiar to the area. The identification of the areas important to these key species is central to the conservation of their populations, particularly in advance of further forestry proposals.

The *Golden Eagle* is dealt with in the following paper by Jeff Watson, who has made a special study of the impact of land use changes on this species. Argyll holds a large proportion of Scotland's eagles, which are of international importance. Many home ranges are increasingly affected by afforestation. Another bird of prey which occurs in the UK in internationally significant numbers is the *Merlin*. Recent surveys indicate a population of 550-560 pairs, and serious declines have been reported in several areas of their UK range. Declines have been associated with loss of open habitat, increased predator problems (in kept areas including forestry blocks) and there remain serious worries over contamination by persistent pesticides. Recent research has shown that the best breeding success appears to be on heather moorland, with reduced success on grassy uplands and a further reduction in afforested areas. On the Argyll mainland there are only a few well documented traditional sites supplemented by sporadic breeding records from other sites. Local information indicates that several areas where Merlin

used to be regular are now no longer suitable due to recent afforestation. The Argyll islands retain a number of breeding pairs, while the islands and the mainland seaboard are a favoured wintering area. Like the Golden Eagle, this species requires extensive open tracts of upland, as it may feed up to 4km from its nest site during the breeding season. Open moorland is favoured by the *Hen Harrier* for breeding, although afforestation can be attractive in its first few years. Later, as the thicket stage approaches, this species is generally excluded. Argyll remains an important area for this species, which has an estimated UK population of 400-500 pairs which is of international significance. Nevertheless, there must remain a serious question mark over the future of this present stronghold in Argyll as further open hunting range becomes planted up. There are also a number of important communal winter roosts on open moorland which could be jeopardised by forestry.

Key upland waders are typified by *Golden Plover*, *Dunlin* and *Greenshank*. Golden Plover breed at low density in west Scotland (around 1 pair per sq km), generally on close-cropped moorland from where they may range out onto adjacent ground to feed later in the season. Dampier areas of moorland appear to be particularly important for young birds. In Argyll the species is poorly documented and although breeding occurs in many areas, densities are generally at the low end of the range. Dunlin exhibit a patchy distribution on wetter moorland, often concentrated where there are well-developed pool systems. The most important Argyll concentrations occur on Tiree (where afforestation is not seen as a threat), and in the NE of the county, especially towards Rannoch Moor. This latter area is also the main area for Greenshank, which occurs only infrequently elsewhere in the county, at its southern breeding limit in the UK.

Both *Red Grouse* and *Black Grouse* are present in Argyll, and in some areas local information suggests that the latter species may now be the commoner. Traditional strip burning of small areas of heather moorland has produced elevated populations of Red Grouse, particularly further east in Scotland, where underlying more base-rich rocks produce a more nutritious moor. Such management practice has been used in Argyll on only a small scale, consequently the increased numbers of waders and other species associated with this managed mosaic of different aged heather strips are also absent. The Black Grouse is a bird of the moorland edge that may benefit from afforestation in its early years, particularly where a mosaic of birch and moorland are retained.

The key moorland passerines are *Ring Ousel* and *Twite*. The former is a summer migrant to upland areas nesting in steep rocky gullies and scree or on vegetated cliffs, where there is access to short turf for feeding nearby. The Twite requires tall vegetation, often heather, for breeding, and it may in suitable areas be loosely colonial, feeding on adjacent upland pasture. In some parts of its range, extensive burning and agricultural intensification may have led to local declines. The Ring Ousel does not appear to be a common breeding species in Argyll, while the coastal areas and islands appear to be the main stronghold of the Twite.

Although not identified as key species, in Argyll the moorlands and uplands support good numbers of Wheatear, Whinchat and Buzzard. A large, widespread and important population of Ravens also occurs, and this may be expected to decline where sheep walk is replaced by forestry, as it has done elsewhere in Scotland. With increased agricultural intensification on lower ground, the populations of such widespread and common nesting species as Snipe, Curlew and Lapwing breeding on marginal hill ground are becoming increasingly important, at least at the local level.

Populations peculiar to the Argyll uplands include small colonies of Arctic Skuas on Coll and Jura. There would seem to be little likelihood of afforestation on Coll but expansion of the existing forests on Jura could conceivably affect the birds there. More significant are the numbers of Red-throated Divers breeding in Argyll, and many of their upland nesting lochs and lochans in Knapdale and Kintyre are already enclosed by recently afforested land. The direct effects of this change in land use on their breeding success are unknown. At the same time the provision of forest roads, increasing access to hitherto remote and inaccessible lochs, could lead to increased and detrimental levels of disturbance by fishermen and others. Scotland's main stronghold of the Chough is on Islay, where there has already been erosion by afforestation of the mosaic of coastal habitats, maritime heaths and close-cropped uplands upon which the species is dependent.

If the range and numbers of species utilizing the remaining open uplands in Argyll are to be maintained, then the scale and location of further new plantings are obviously of greatest concern. It is hoped that the present consultative procedures, when consideration is being given to

new forestry proposals, will be applied as widely as possible to all concerned parties.

Many of the existing new forests in Argyll were planted when timber production was the primary concern and the role of wildlife conservation was a very secondary objective. With forestry now a major land use in the district and far greater recognition being given to the important conservation role, there is considerable scope for the enhancement of existing forests. The opportunity exists to think positively and make a major contribution to wildlife in some of these areas by creating a greater diversity of structure and age. There are already considerable steps being taken by the Forestry Commission on their own estate to work towards these ends, and it is hoped that these principles will be extended and applied rigorously throughout the private forestry sector too.

Mention must finally be made of the fine series of semi-natural broadleaf woodland, mainly oak, in the district. These support a wide and rich bird community, with particularly good numbers of Wood Warblers, Redstarts and Tree Pipits. Many are in need of active management to encourage their regeneration and secure their future. The best examples at present still indicate the richness and variety of their bird communities. Hopefully with the new broadleaf grant scheme, and the insistence by the FC of a minimum level of broadleaf plantings in each newly planted conifer block, this resource can be further protected and extended to the benefit of all.

GOLDEN EAGLES AND LAND-USE IN SCOTLAND
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The golden eagle has, in a romantic and sometimes mystical way, symbolised the wild landscape of the Scottish Highlands. Until recently though, an understanding of the ecology of eagles across the range of habitats which make up this landscape has been lacking. In 1982 NCC set out to unravel the relationships which exist between golden eagles and land-use in Scotland. The report on this work has now been produced.

Our study documented differences in eagle populations living under a variety of land-uses and looked for answers to the questions 'Why are there more eagles in some areas than others?' and 'Why do eagles breed more successfully in some parts of the country than others?' It went on to investigate changes in eagle populations over the past 25 years and, where possible, sought to make predictions for the future.

During the summer of 1982 the NCC and the RSPB cooperated in a comprehensive national survey of golden eagles, the results of which showed that over 420 pairs or some 20% of the European population occurred within Scotland. Over the next three years the fortunes of about 120 pairs were followed, this sample being distributed amongst six discrete study areas from Sutherland south to Argyll and east to Aberdeenshire.

The key to much of the variation amongst eagles turned out to be food, although food was itself closely related to the type of land-use practised; in particular whether and how land was managed for sheep, red deer or commercial forestry. Whilst eagle eyries can sometimes contain a veritable abattoir of unlikely corpses — one nest in the west of Scotland displayed the remains of a peregrine falcon, a hedgehog, two young foxes and half a dozen herring gulls — more commonly the eagle is a bird of conservative tastes. In the summer months when young are being fed the four species most frequently taken are red grouse, mountain hare, rabbit and ptarmigan. By contrast, in winter, the eagle at least in western Scotland becomes a committed scavenger favouring the plentiful supplies of carrion in the form of dead sheep and deer. All these various prey species are essentially animals of open, unwooded terrain and most occur predominantly in the uplands.

Our investigation of breeding density and performance amongst eagles detected both marked and consistent differences between areas. In general eagles were most numerous in the west and south-west Highlands with lowest densities in the east and intermediate numbers in the north-west. The environmental variable most closely linked with nesting density was found to be the amount of winter food, and more specifically the amount of carrion available on surrounding hillsides. Put simply, the more dead sheep lying around, the more eagles there will be in any given area.

Perhaps surprisingly the breeding success of eagles did not follow the same pattern found for density. Instead the most successful birds were in the east Highlands and breeding performance in the west was not far short of atrocious. This is less surprising when we recollect the shift in diet amongst eagles between winter, the season of 'territory establishment', and summer, the breeding season. Carrion is both less plentiful in summer and quite impractical for transportation to nest sites. We found that eagles with the highest breeding success occurred where medium-sized birds and mammals such as grouse and hares were most plentiful.

Over the past 20 or 30 years the balance of land-uses in the Scottish Highlands has been changing. In much of the west, extensive hill-sheep farming has been abandoned with a move towards management for red deer alone in the north and a massive shift to commercial forestry in the south, particularly in Argyll. There have been fewer changes in the east, although some large sporting estates have sought to change their deer culling policies in line with the recommendations of the Red Deer Commission. Whilst the present golden eagle population is generally healthy, there have undoubtedly been some recent changes which serve as a warning against undue complacency. For example the number of breeding eagles in mid-Argyll has declined by over 30% since the late 1950s and much of this can be explained by the removal of hill-sheep and their replacement by forestry.

As with most creatures dependent on the semi-natural habitats of dwarf-shrub and grassland which dominate the upland landscape of Britain, the golden eagle is most vulnerable to changes

which inflict rapid wholesale changes to that landscape. Plantation forestry is the most conspicuous such change. With the anticipated continued expansion of forestry in the south-west Highlands it is inevitable that more pairs will be lost. Some difficult judgements may soon be needed on the scale of losses which can be permitted amongst such a pivotal element in the natural economy of the uplands such as the golden eagle.

