

the Forth Naturalist and Historian

Volume 28 2005

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Lindsay Corbett, the University Biological Sciences, and 30 Dunmar Drive, Alloa, FK10 2EH.

Journal Editor:

N. Dix, 7 Laurelhill Place, Stirling, FK8 2JH.

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THE FORTH NATURALIST AND HISTORIAN

The Forth Naturalist and Historian (FNH) is an informal enterprise of Stirling University. It was set up in 1975 by several University and Central Regional Council staff to provide a focus for interests, activities and publications of environmental, heritage and historical studies for the Forth area, comprising now local authority areas Stirling, Falkirk and Clackmannanshire.

The promotion of an annual environment/heritage symposium called *Man and the Landscape* has been a main feature, and this year, the 31st, *Landscapes by Design*.

The annual *Forth Naturalist and Historian* has since 1975 published numerous papers, many being authoritative and significant in their field, and includes annual reports of the weather, and of birds in the locality, plus book reviews and notes. These volumes provide a valuable successor to that basic resource *The Transactions of the Stirling Field and Archaeological Society, 1878-1939*. Four year contents/indexes are available, and selected papers are published in pamphlet form, while others are available as reprints.

A major publication is the 230 page *Central Scotland – Land, Wildlife, People 1994*, a natural history and heritage survey, and used in the form of a CD-Rom, *Heart of Scotland's Environment* (HSE).

Other FNH and associated publications still in print include – *Mines and Minerals of the Ochils, Airthrey and Bridge of Allan, Woollen Mills of the Hillfoots, The Ochil Hills* – landscape, wildlife, heritage – an introduction with walks, *Alloa Tower and the Erskines of Mar*, and the *Lure of Loch Lomond* a journey round the shores and islands. Several of these are in association with Clackmannanshire Field Studies Society.

FNH publications are listed on the internet British Library (BLPC) and by booksellers e.g. Amazon, Bol, Barnes and Noble.

Offers of papers/notes for publication, and of presentations for symposia are ever welcome.

Honorary Secretary Lindsay Corbett,
University of Stirling, FK9 4LA, and 30 Dunmar Drive, Alloa, FK10 2EH.
Tel: 01259 215091. Fax: 01786 494994.
E-mail: lindsay.corbett@stir.ac.uk
Web: <http://www.fnh.stir.ac.uk>

DUNBLANE WEATHER REPORT 2004

Neil Bielby

I have been recording the weather since 1994 and all averages etc. refer to the last ten years.

The weather station is my suburban back garden in Ochiltree, Dunblane. This is situated 50 metres to the east of the Dunblane Hydro ridge, 100 metres a.s.l., in a shallow, sheltered valley.

I record daily rainfall, maximum and minimum temperatures, barometric pressure, cloud cover and wind direction and speed (Beaufort Scale). All except the maximum daily temperature are recorded at 09.00. A brief description of the day's weather is also recorded along with exceptional and unusual weather phenomena across the UK.

2004 was slightly warmer and wetter than normal. The average minimum temperature was 0.49°C above the mean at 4.76°C with the average maximum temperature 0.25°C above the mean. Measurable precipitation fell on 254 days totalling 1135.6 mm for the year, 3.7 % above average. There were 57 air frosts, 11 less than the norm, with snow lying on 11 mornings. In the UK temperatures were 1.2°C above average with average sunshine and above average rainfall.

January The weather was a mixture of short wintry spells separated by longer mild, often wet periods. It was slightly wetter and warmer than average with precipitation falling on 28 days. There were 15 night frosts but only two days when the daytime temperature did not rise above freezing. The large garden pond was frozen for 17 days and snow lay on the ground on 8 days.

The cold spell at the end of December continued into January with a thin covering of snow lying until the 4th. The weather was calm with a sunny day on the 2nd. A SW airstream then developed bringing a spell of milder, wetter weather. Heavy rain during the daytime on the 8th turned to heavy showers through the night to record a 24 h total of 24 mm at 09.00 on the 9th. Strong SW 6-7 winds on the night of the 10th/11th were accompanied by frequent heavy showers, the latter continuing for the next two days giving a 60 h total of 43.9 mm. A few days of calm weather with good amounts of winter sun followed until the weather turned milder and wetter from the 18th-24th. Night frosts returned on the 25th with -5.5°C, the coldest night of the month, being recorded at 09.00 on the 28th. On the 28th a bitterly cold N 5 wind developed during the afternoon along with the odd snow flurry as an arctic blast swept south over Britain. Dunblane only received 6 mm of snow but from Aviemore north and down the east coast of Britain blizzard conditions deposited up to 30 cm with many roads, including trunks, blocked. It quickly turned mild again on the 30th with rain most of the day. However, a very moist depression

crossing England on the 31st deposited snow on its northern edge from the Borders to Tayside as it collided with the cold air over N. Scotland. With a NE 4 blowing blizzard conditions again ensued and by 17.00 6 cm was lying in Dunblane although amounts were negligible on the Carse of Stirling.

February was slightly warmer but much drier than average with precipitation the second lowest in 10 years, being only 46 % of the mean. There were 16 dry days, 15 air frosts and snow lay on three mornings. Average air pressure was the highest in 10 years and the 12.2°C recorded on the 3rd was also the highest daytime temperature during this period.

Eight cm of lying snow quickly melted as the wind changed from NE 1 to SW 3 around noon on the 1st. This heralded a spell of wet and windy weather from the SW with a continuous line of fronts, their origins deep in the South Atlantic, crossing Britain during the next five days. 35.6 mm of rain fell during this period (Capel Curig had over 400 mm, twice its Feb. monthly average!) which was accompanied by unseasonably mild weather. Temperatures peaked at 12.2°C on the 3rd with Lossiemouth recording 16.7°C the same day (a new Feb. high) and Gravesend reaching 18°C the following day. The wind was often strong and blustery, reaching SW 7 on the 3rd and SW 8 in exposed places on the 6th when speed limits on the Forth Road Bridge were reduced to 40 mph. The weather turned wintry again on the 7th as arctic winds were drawn in from the NW. Snow showers during the day eventually led to an accumulation of 8 cm by 21.00. The cold NW airstream slowly moderated during the 8th and a rapid rise in temperature during the night of the 9th/10th saw the disappearance of the lying snow, as 7°C was recorded at 09.00 on the 10th. A spell of quiet weather then ensued as high pressure built to 1030 mb over the next two days giving calm but often cloudy weather. A slow moving weak front on the 16th gave 3.8 mm of rain but the high pressure system quickly re-established itself the next day, rising to 1036 mb, with three days of calm, unbroken sunshine. The 20th was overcast with a light E 1 wind as the high pressure started to drift away E. A succession of night frosts lasted from the 17th until the end of the month with only the night of the 23rd/24th staying above 0°C. The coldest night being the 28th/29th when -7.6°C was recorded. A cold northerly airstream set in on the 22nd and lasted until the end of the month. The days were sunny but with an icy cold wind and occasional light snow flurries. The Northern Isles, Northern and NE Scotland bore the brunt of this arctic blast with blizzards on several days which closed schools and roads and kept aircraft grounded. Shetland received 40 cm of snow in 18 h at one stage but most of it blew away in the gale force northerly winds.

In Scotland as a whole, the 2003-4 winter was 1°C warmer than average with average amounts of sunshine and rainfall.

March had average temperatures but was 20 % drier with 53.5 mm of precipitation which fell on 19 days. There were nine air frosts. A south-westerly airstream predominated with winds from that airt on 14 days.

The month started on a frosty note with -7°C recorded on the morning of

the 1st followed by a day and a half of unbroken sunshine. The wind switched to the SW during the afternoon of the 2nd as increasing cloud heralded a short spell of milder, damper weather. Any rain was mostly light with only 5.3 mm falling over the four days before a large blocking high (1040 mb, 9th) brought another spell of night frosts and glorious sunny, calm days. By the 11th, queuing Atlantic fronts started to edge in as the high slipped away NE drawing in cold easterly winds for a couple of days. The weather was very unsettled from the 14th-20th with windy and often wet weather. The mild SW airstream resulted in 18°C being recorded at Lossiemouth on the 16th. 43.9 mm rain fell during this period. The weather calmed down from the 21st with a succession of sunny days with light winds. Night frosts were recorded from the 22nd-24th with a minimum of -3.1°C on the latter morning. Light SW winds saw the temperature rise to 15.1°C on the 27th, the warmest day of the year so far. This settled spell lasted until the end of the month with light easterlies on the last two days.

April was warmer and wetter than normal with the night minimum temperature 33 % above the average. The daily maximum was 5 % up and rainfall was 27 % above average (79.3 mm) with rain falling on 21 days. There were only two night frosts. This was mirrored across Scotland as whole with the temperature 2°C above average, 14 % more rain and only 70 % of average sunshine.

The month was unsettled and changeable up to the 22nd when a high pressure system (1022 mb) settled over the country to give a short spell of dry weather. This resulted in the highest temperature of the year on the 26th when 17.9°C was recorded. (It was even warmer in the south of England with temperatures reaching 23°C in London on the 24th) The 25th and 26th were days of unbroken sunshine made all the more pleasurable by it being the weekend. As the high drifted away North-easterlies set in reaching force 5 on the 30th giving a cold, grey end to the month although the rain that had persisted down the East coast for several days thankfully did not penetrate this far inland as had been forecast.

May was warmer and drier than average with daytime temperatures 2.13°C above average and night temperatures plus 1.06°C. Rainfall, at 54.3 mm, was 15 % below average. 93 % of the precipitation fell during the first 10 days with only 4 mm over the last 21 days. The 1st was cloudless, calm and warm reaching a year high of 18.4°C. The weather then turned very unsettled as a low of 975 mb settled over the country on the 4th. Its slowly circulating fronts gave spells of heavy rain with 22.5 mm falling on the 4th. Winds were calm or light from an easterly direction with some long sunny spells between the downpours. A convection electrical storm at 15.00 on the 6th was accompanied by heavy rain and hail.

The next day a front moved in across the country from the North Sea giving dreich, drizzly conditions which slowly cleared on the morning of the 8th to give a warm, pleasant afternoon before the clouds bubbled up again resulting

in another downpour of 8 mm in an hour. Two pleasant, sunny days followed, with 25°C on the 10th being the warmest of the year to date. This triggered another electrical storm at 20.45 when 7.5 mm rain fell in one hour. The weather then settled down as high pressure built over the country to reach 1030 mb by the 16th. There was no precipitation for seven days with much sunshine and mostly light SW winds. Weak fronts moving down from the NW between the 18th and 21st, accompanied by fresh SW winds, occasionally up to force 5, produced little rain. Another timely high of 1032 mb appeared over the country on the 22nd to give a second consecutive, gloriously cloudless, weekend. The settled weather continued for the next seven days as the high slowly dissipated with light winds and the occasional shower from the 28th.

June became increasingly unsettled with temperatures around the average but with 25 % more rain which fell on 21 days. A southwesterly airstream prevailed for the majority of the time.

The month started with a spell of unsettled weather as Atlantic fronts crossed the country giving 13.5 mm of much needed rain in the first three days. A weak ridge of high pressure then pushed north to give the fourth good weekend of fine, dry weather in succession. This was however, accompanied by fresh SW-W winds. The weather became unsettled by midweek again with a day of grey haar accompanied by NE 3-5 winds on the 8th. A band of thunderstorms crossed the country on the afternoon of the 12th whose associated downpours produced 12 mm of rain. Yet again a weak ridge of high pressure moved in for the weekend with Saturday 12th being sunny and warm with a max temp. of 24.7°C. A southwesterly airstream prevailed from the 13th-17th with little sun or rain until the 17th when heavy, prolonged showers in the evening and through the night gave 13.1 mm of welcome rain to the farmers and gardeners. Winds shifted to a much cooler NE direction on the 18th then from the NW on the 19th when the max. temperature reached only 12.7°C. The 20th started bright and sunny but heavy showers developed in the afternoon and evening giving 9.5 mm of rain. The next couple of days were sunny and pleasant but a deepening low of 996 mb moved over the country on the 26th with its accompanying slow moving front depositing 31.7 mm of rain in 32 hours (100 mm fell in the Southern Uplands). The rain was driven in on strong NE 5-6 winds and, with a maximum temperature of only 11.7°C, the day felt distinctly wintry, causing central heating systems to be reactivated. The 25th brought a brief respite with sunshine and a much more seasonal temperature of 20.8°C before yet another front gave 6.5 mm of rain between 11.00-17.00 on the 26th. The unsettled weather continued until the end of the month with a slow moving depression depositing 16.7 mm of rain between 14.00 on the 29th and noon the next day.

July was a quiet month with temperatures slightly below average. It was however, much drier than normal, with only 43 mm of rain, 54 % of the average. Even so, rain fell on 20 days and there was only one day of unbroken sunshine. Pressure ranged from 1003-1021 mb and a south-westerly airstream predominated. The max. temperature was 23.8°C (30th).

The month continued where June left off with unsettled weather and heavy showers most days. The 5th-9th were virtually dry with good amounts of sunshine although temperatures struggled to reach the seasonal norm. On the 7th and 8th the southern half of England suffered storm conditions with torrential rain and gale force winds which caused flooding and brought down trees and powerlines. On the 8th, the coldest July day on record was recorded in the midlands of England whilst Tiree had a day of unbroken sunshine. The remnants of this system settled across the east coast of Scotland from the evening of the 9th giving damp, wet and murky conditions for a couple of days which periodically stretched westwards.

August 2004 was the wettest in 10 years of recording in Dunblane (and probably since records began for Scotland) with the 171.9 mm measured being 2.5 times the average rainfall for the month. This made it the eighth wettest month during the last decade. Temperatures were around average and winds were from a NE or E. airt for 65 % of the month.

The deluge started on the night of the 3rd, when heavy rain followed a humid day. By the time it ceased around mid afternoon on the 4th, 23.5 mm had fallen. The 5th was again very humid resulting in a thunder and lightning storm during the night with the accompanying torrential rain totalling 26.4 mm. A virtually dry weekend (a feature repeated throughout the month) provided a brief respite before the main event. Heavy rain fell on the night of the 8th with another thunder storm the next morning. Heavy rain continued all that day and the next, resulting in a total of 70.6 mm in just 57 hours (more than the average total for August). This abnormally wet spell resulted in several landslides and flash floods including the A 85 road in Glen Ogle being swept away in two places, the stranded motorists being rescued by helicopter. The month continued unsettled with driving rain during the evening and night of the 26th producing a further 15.2 mm.

September became progressively unsettled with a predominately southwesterly airflow as the remnants of several North American hurricanes doused the country. Temperatures and rainfall were very close to the average.

The month started with a spell of damp and gloomy weather but pressure built steadily to reach 1044 mb by the 7th resulting in a spell of 3 days of almost unbroken sunshine and warm temperatures. Pressure fell rapidly during the night of the 9th/10th as the remnants of yet another hurricane approached Britain. This heralded a spell of unsettled weather with a southwesterly airstream, often blustery, and daily rain, some heavy. The day of the 15th brought a brief respite as a weak ridge of high pressure gave an almost cloudless day with light NW winds. The next five days saw the return of unsettled weather with an unstable southwesterly airflow, rain falling each day totalling 42.7 mm. On the 21st the winds veered to the NW as a another weak ridge of high pressure built over the country. This resulted in two perfect autumn days of unbroken sunshine and light winds on the 23rd and 24th. A weak front moved down over Scotland during the night of the 24th but rainfall

was meagre at 0.3 mm. The rest of the month was quite dreich with little sunshine and plenty of drizzle, interspersed by heavier bursts of rain.

October was a little cooler but much wetter than normal. The 207.3 mm of rainfall was 44 % above the mean for what is, on average, the wettest month of the year. It was the 2nd wettest month ever in ten years. (the wettest was October 1998 with 219.4 mm). Rain fell on 27 days and there were only one air and two ground frosts. Leuchars recorded its wettest October since records began in 1921 with 175 mm.

The month started unsettled and very wet with 60.4 mm of rain falling in the first five days. A quieter spell of weather between the 7th-11th brought the first air frost of the winter with -0.6°C being recorded at 09.00 on the 9th. The weather turned unsettled again as a series of complex and slow moving lows moved in from the Atlantic. The nights of the 14th and 15th were particularly wet with 17.1 mm and 19.5 mm falling respectively. Pressure fell rapidly on the 20th with light rain from noon on. The night was very wet and windy (SW 5-6) with 27.5 mm having fallen by the time the rain ceased at 10.30 the next day. The 22nd and 23rd provided a brief respite with dry, sunny days before heavy rain started to fall again in the early hours of the 24th. The week continued wet with 19.1 mm falling on the 24th and regular amounts for the next 5 days. Easterly winds, occasionally strong, blew from the 27th-29th. High pressure moved in from the Atlantic on the 30th to ensure that the last two days of the month were atypically dry. The 31st, a Sunday, being particularly sunny and mild.

November turned out to be slightly warmer and much drier than average with only 47.4 mm of precipitation, 44 % of the mean and the driest in 10 years. Surprisingly, some rain was recorded on 24 days but amounts were generally small with the highest 24 hour total being only 7.5 mm. Hours of sunshine were below average.

The month started quietly with a perfect sunny day on the 1st. The next four days were mostly dry with varying amounts of sunshine. Rain fell on a couple of nights but amounts were small. Bonfire night was dry but steady rain set in at 14.30 on the 6th with 6.4 mm falling. A spell of quiet weather ensued with several sunny days and little precipitation. A frost on the morning of the 13th was followed by three dreich days with persistent drizzle during the day and rain at night. The 17th was a windy day with westerly winds up to force seven in exposed areas and squally showers through the night. The weather then settled down with cold sunny days on the 19th and 20th accompanied by frosts, -4°C and -5.3°C respectively. The garden pond froze over for the first time this winter on the 19th and temperatures only reached a max. of -0.2°C on the 20th. The North and East coasts of Scotland received substantial snowfall on the 19th with the football match at Pittodrie, Aberdeen having to be cancelled on the 20th. Sleet early in the morning of the 21st combined with a min. temp. of -6.8°C (-12°C at Glascarnoch Resr.) resulted in lethal black ice throughout West, Central and NE Scotland. The weather turned milder as a

warm front moved in during the night of the 21st/22nd with a temperature of 8°C at 09.00 on the 22nd. The next four days were damp and dreich with little or no sun but a front clearing Scotland during the night of the 25th/26th brought fresher, sunnier conditions behind it on the 26th. The 27th was wet and raw with rain from 10.30-19.00. Clearing skies and a cold Northerly airstream resulted in a clear, sunny day on the 28th. The month ended quietly with two overcast, damp days and a fresh southwesterly airstream.

December temperatures were 1.26°C above average. There were ten frosts and snow lay on one day (appropriately Christmas Day!) Rainfall was close to average with measurable precipitation on 26 days.

The first two days of the month were sunny, calm and cold with the temperature falling to -5.5°C in the early hours of the 2nd and remaining below freezing during daylight hours. Dense, freezing fog filled the Forth valley but Dunblane remained clear until patches drifted up in the late afternoon. Temperatures rose rapidly after dark as a warm front moved SE across Scotland and a mild Southwesterly airstream developed. This mild airstream continued for the next twelve days with a mixture of damp, dreich weather interspersed with the odd short glimpse of a weak, watery, winter sun. Some precipitation was recorded most days with particularly vigorous fronts sweeping across the country on the 14th and 16th accompanied by strong to gale force winds and driving rain. On the 17th the wind veered to the NW and eased resulting in night frosts (-6.7°C on the 19th) with mostly calm, sunny days as a ridge of high pressure developed on the 19th. Sleet showers overnight on the 17th/18th froze to give treacherous driving conditions on untreated roads. The 20th and 21st were overcast with night frosts but a vigorous front brought gale force westerly winds and rain through the night of the 21st/22nd with fallen trees blocking the A 84 road between Stirling and Strathyre in several places. The winds eased during daylight hours on the 22nd and it remained mostly dry but strong southwesterly winds and rain returned in the evening. Snow showers fell from midday on the 24th and continued into the night. The 25th dawned clear with a frozen carpet of snow 2 cm deep. It remained calm and sunny throughout the day, perfect Christmas Day weather. Unsettled, wet weather returned on the 26th and remained until the year end with little sun and rain every day.

BOOK REVIEWS

Birds. Journal of the RSPB, Autumn 2005. Includes Duncan Orr-Ewing. Buzzards. 3pp.

This journal is in the University library and this paper shows they are becoming more numerous and appearing in unexpected places. Some background notes here, with illustrations by Mike Langman.

The Islands of Loch Lomond; Footprints from the Past. A Review by The Friends of Loch Lomond. 36pp. £4.50.

For over 20 years the FOH has with its President Hannah Stirling helped to protect and preserve the area, to promote safety and to encourage only suitable and limited development. Archaeological studies of the islands and crannogs have been few, so it was decided to undertake a full proper archaeological survey. This was completed over three years and comprises three large and very academic volumes (available in the Mitchell Library). This 'easy to read' summary of the findings.

The first part of the book deals with the background, and the second details findings on the individual islands.

The Birdwatcher's Yearbook and Diary 2006. Buckingham Press Ltd.

This extensive resource is due 29 Oct. '05 at £15.39.

Best Birdwatching Sites in the Scottish Highlands. Gordon Hamlett. Buckingham Press/Swarovski. ISBN 0 9333840 9 8. £15.95.

22 sites N of Pitlochry and incl. Skye, comprehensively and expertly resourced, and with detailed maps, Scottish Bird List and much more.

The BTO/CJ Garden BirdWatch Book. Mike Toms. British Trust for Ornithology. 130pp. ISBN 1 902576 73 X. £9.99.

This book presents new information gleaned from the first eight years of the project, a partnership of thousands of birdwatchers and professional ornithologists. For anyone interested in garden birds, and in finding out why species visit gardens at specific times of year or which foods to provide, this book is an invaluable reference source. Contents – gardens for birds; ecology; plus 50 species accounts; identification; and further reading.

Bird Table; the Magazine of Garden BirdWatch. Issue 42 summer 2005.

20 pp of notes and illustrations on tits, moths, and a window strikes-first results from over 12,000 returns, a summer '05 work is expected to yield a scientific paper and some actions.

Clackmannanshire Outdoor Access Strategy; consultative draft. 31pp.

In response to the Land Reform (Scotland) Act 2003, this sets out an overall vision, and consolidated rights of way and public footpaths, in the context of the new legislation.

Biodiversity and Opencast Coal Mining; a good practice guide. SNH and RSPB. 20pp.

With some useful references on opencast Coal Restoration.

Rum; a landscape without Figures. John A. Love. Birlinn. 200pp. ISBN 1 84158 224 7.

The author is Scottish Natural Heritage's area officer for Uists, Barra, St Kilda with many years studying and 10 living on the island and gives us here a comprehensive resource, well laid out and illustrated, and readably presented. The island has a rich cultural and natural heritage to justify its status as one of Scotland's finest nature reserves. From its Mesolithic period settlements, early Celtic Church, the Vikings, Clanranalds and Macleans of Coll, the Clearances, the Marquess of Salisbury's time, the Kinloch Castle and ostentatious contents of the Lancashire industrialists, the Bulloughs, to the problems of today and possible future.

SURVEYING THE LARGE HEATH BUTTERFLY WITH VOLUNTEERS IN STIRLINGSHIRE

David Pickett and Julie Stoneman

Introduction

The Large Heath *Coenonympha tullia* is a relatively widespread butterfly in the northern part of the UK but has suffered a severe decline and contraction of range in the last century due to drainage of lowland bogs for agriculture (Bourn and Warren, 1997). A survey in 1995-1999 showed that the butterfly had been lost from 47 % of the 10 km squares where it had been recorded in 1970-1982 (Asher et al, 2000).

The Large Heath is a Species of Conservation Concern in the UK Biodiversity Action Plan and is listed on Schedule 5 of the 1981 Wildlife and Countryside Act (Bourn and Warren, 1997). It is afforded Medium Priority in the Stirling Council Area Local Biodiversity Action plan (Willet, and Stirling Council Area Biodiversity Action Plan Steering Group, 2001) and High Priority in Butterfly Conservation's Regional Action Plan for south west Scotland (Kinnear and Kirkland, 2000).

In the Stirling Council Area most records of the butterfly are confined to certain parts of Flanders Moss and a few of the remnants of lowland raised bogs on the Carse of Stirling. However, its current status is uncertain because of a lack of recent records. A number of suitable raised bogs have no records.

In 2005 Butterfly Conservation Scotland ran a project called "Butterflies and Moths mean Business", with the aim to raise awareness about butterflies and moths and to recruit new volunteers to help carry out recording. Volunteers were recruited through a series of training workshops where background information about the ecology of butterflies and how to identify them were explained, followed by a field trip to see the species in its natural habitat and practice survey methods. A mixture of workshops were held – both of an introductory nature and more specialist ones focussing on particular species.

At the same time, Scottish Natural Heritage (SNH) were working to raise awareness of the importance of the Forth Valley lowland raised bogs with both local landowners and the general public in Stirlingshire. The aim was to promote greater interest in sympathetic management of these raised bogs and the species found on them. By focusing on some of the more attractive bog species indirectly, interest can be raised in the less attractive bog habitat itself. But first more information was needed about the current status of the butterfly. Therefore, the two organisations teamed up to recruit volunteers to survey the lowland raised bogs for which SNH was to give habitat management advice.

Methods

A Large Heath training workshop was held on 30th July at West Moss-side

Farm, adjacent to Flanders Moss. Participants were given background information through a series of presentations about the ecology and status of the butterfly, its habitat and how to identify and record it, as well as relevant information about how to carry out the survey including health and safety information. This was followed by a field trip to Flanders Moss National Nature Reserve to look for the butterfly itself and to help participants recognise suitable habitat.

Preparation was a key part to enable volunteers to survey sites safely, confidently and competently. Considerations included:

- a map for each site was produced showing access routes from main road, parking, access route onto the site and main hazards e.g. ditches
- guidance was given on how volunteers could visit the site safely using a generic risk assessment and highlighted hazards (Stoneman, 2005)
- landowners were contacted beforehand for access permission and the results were passed back to them.

The participants were encouraged to survey one of five sites in the Stirling Council Area during the month of July (the main flight period for the butterfly).

The timed count method was used for the survey using a standard survey form. Volunteers were asked to walk the area indicated on a map as thoroughly and evenly as possible counting Large Heaths, making a note of the time taken to carry out the survey. Details of weather, habitat, land management and any other relevant information were also recorded.

Results

All five sites were surveyed by six volunteers, some more than once. One volunteer surveyed an additional six sites – all lowland raised bogs with Site of Special Scientific Interest (SSSI) status within or immediately adjacent to the Stirling Council Area of which one had been surveyed prior to the workshop (Sexton, 2005). The data are shown in Table 1, and a summary for each site is given below drawing from the original survey forms and Sexton, 2005.

Healthy populations were found at five of the eleven sites surveyed (Ballangrew (west part of Flanders Moss), Scottish Wildlife Trust part of Flanders Moss, Killorn, Offerance and Shirgarten Mosses), with highest counts of between 22.7 – 96 Large Heaths per hour. Other sites are considered below:

Carsebreck Moss: Despite apparent suitable habitat at the site, no Large Heaths were seen. It was described as being a very exposed site, yet the weather conditions were calm when the survey was carried out. Further investigation is required to establish if Large Heaths were found here historically or if they are found nearby – it may be that there are other reasons (e.g. isolation) for the butterfly's absence.

Ochertyre Moss: No Large heath were found at this site, possibly due to unsuitable habitat – the larval food plant, Hare's-tail cotton grass *Eriophorum vaginatum* was described as patchy and sparse and mainly beneath pine.

Table 1: Results of the Stirlingshire Large Heath Survey 2005

Site name and nearest village	Central grid ref	Abundance index**		Date of survey	Weather conditions	No. Large Heath seen	Time searching (mins)	LH/hr	Volunteer
		<i>Eriophorum vaginatum</i>	<i>Erica tetralix</i>						
Ballangrew* (west part of Flanders Moss)	NS618984	2	3	04/07/05	Very hot and still	17	45	22.7	Roy Sexton
Port of Mentieth									
Carsebreck Moss*	NN862095	1	3	01/07/05	Sunny and still	0	60	0	Roy Sexton
Blackford									
SWT part of Flanders Moss (SWT)* Kippen	NS639973	1	4	26/06/05	Warm, sunny and still	17	45	22.7	Roy Sexton
Killorn Moss, Kippen	NS621961	1	4	07/07/05	Sunny, warm, still	47	45	62.7	Roy Sexton
Ochertyre Moss*	NS735974	4	3	11/07/05	100% sun, 26°C	52	150	20.8	Dan Baker
Blairdrummond	NS735974	4	3	05/07/05	Overcast, warm, still	0	45	0	Roy Sexton
				07/07/05	Sunny, still	0	45	0	Roy Sexton
Offerance Moss	NS536961	2	2	06/07/05	Breezy, overcast 17°C	1	30	0.5	Judith Neil
Aberroyle	NS538957	1	4	07/07/05	Hazy sun	36	30	72	Roy Sexton
	Eastern half of	2	2	09/07/05	Breezy, partly cloudy 24°C	20	120	10	Judith Neil
	NS5395								
SE part of Flanders Moss*	NS662982	3	4	07/07/05	Hazy sun, light breeze	1 (?)	60	1 (?)	Roy Sexton
Thornhill				07/07/05	Sunny, still	0	45	0	Roy Sexton
Shirgarron Moss*	NS646962	1	4	01/07/05	Sunny, breezy (but locally sheltered)	96	60	96	Roy Sexton
Kippen									
Wards of Goodie	NS638997	2	3	12/07/05	Sunny, hot, west wind 3-4	0	120	0	John Snodin
Northern part of Flanders Moss				18/07/05	Cloudy periods, hot, west wind 2-3 rising to 3-4	0	140	0	John Snodin
Thornhill									
Wester Moss*	NS838909	3	3	05/07/05	Warm, still, mainly overcast	3	45	4	Roy Sexton
Fallin									
West Moss-side	NS660993	2	3	03/07/05	Overcast, no wind	0	120	0	Kate Sankey
North-east part of Flanders Moss				15/07/05	Sunny, light breeze	0	90	0	Kate Sankey
Thornhill				22/07/05	Sunny, v. hot, little breeze	0	120	0	Kate Sankey

*Additional sites surveyed

** Abundance index: 1) widespread and abundant; 2) frequent; 3) patchy - locally abundant; 4) patchy - sparse; 5) rare/none

Polder Moss (south-east part of Flanders Moss): Only one (unconfirmed) Large Heath was sighted here. The larval food plant is patchy but locally abundant, but cross-leaved heath *Erica tetralix* (the main adult nectar source) is described as sparse. This site is managed by Scottish Natural Heritage and has undergone conifer extraction in recent times to restore the lowland bog. It is possible that either that habitat conditions are not yet sufficiently developed for the butterfly to survive here, or that the butterfly has not yet re-colonised the area. Further monitoring of both habitat and butterflies should continue.

Wards of Goodie (north edge of Flanders Moss): No Large Heaths were found here. During the survey it was noted that suitable vegetation only covers part of the site and that the weather conditions were not ideal. In addition, the flight period may have ended earlier than usual in 2005, as no Large Heaths were found at any sites after July 11th (Figure 1). Records from other nearby sites (which will not be available until early spring) will verify this, but for the time being, it is recommended that the survey of this site should be repeated.

Wester Moss: Only three Large Heath were seen on this site in a 45 minute period, all near Hare's-tail cotton grass which was growing in an area where a ditch has been dammed. This site is currently being monitored and restored by Stirling Council, and further monitoring of both butterflies and habitat should be continued.

West Moss-side (north-east part of Flanders Moss): Three counts were made of the site but no butterflies were found, despite apparent suitable habitat. However, seven were found near to this site during the workshop (in NS6499) in weather conditions which were less than ideal.

The zero counts may be explained by weather (the first count was made in cloudy conditions and it may be that Large Heath were not flying) or timing (the other two were after July 11th when the flight period may have come to an end – see Figure 1). Therefore a survey of this site should be repeated to ascertain the butterfly's status.

Conclusions

The workshop was successful in recruiting volunteers to cover the five sites that needed urgent survey work in the area. In fact, much more survey was carried out than originally envisaged, with six additional sites being surveyed.

Of the eleven sites, five are in good condition and support a healthy population of Large Heath (Ballangrew – Flanders Moss, SWT- Flanders Moss, Killorn, Offerance and Shirgarten Mosses). The status of the butterfly is still uncertain and further survey is required at two sites (West Moss-side – Flanders Moss and Wards of Goodie – Flanders Moss), two are undergoing management to improve the condition of the raised bog and should be monitored over the coming years to assess any increases in the Large Heath population (Polder and Wester Mosses), one appears to be unsuitable for Large Heath (Ochertyre Moss) and further work is required to establish why Large Heath is not present for the remaining site – Carsebreck Moss.

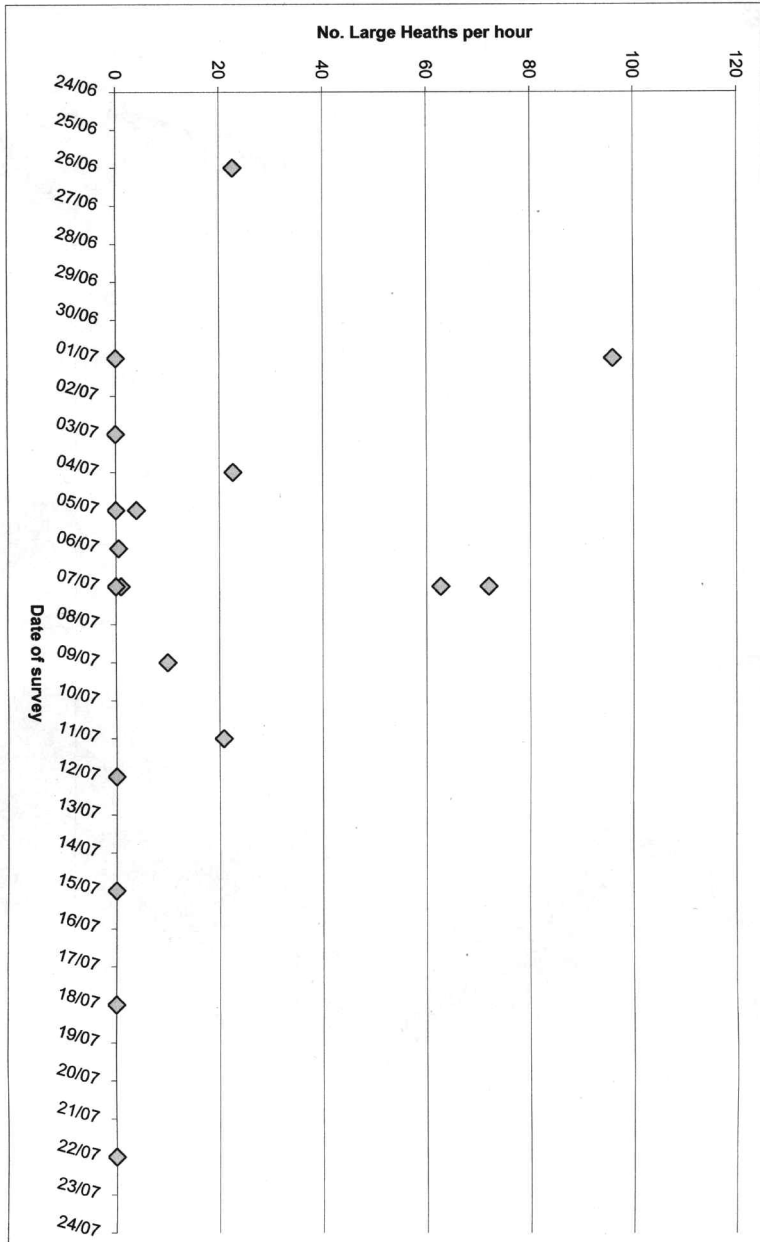


Figure 1 Counts per hour on dates of survey.

The workshop has been a good example of what can be achieved by keen, motivated volunteers. There is now a clearer picture of the distribution of this locally important species. As management prescriptions are drawn up for improving the overall habitat condition of this nationally important cluster of raised bog sites these prescriptions can now take into account the requirements of the Large Heath. With a simple base line survey the success of these prescriptions in terms of Large Heath can be assessed in the future.

The results of the survey will be made public and distributed to the land-owners of the sites. This should prove to be an effective way of raising the profile of a less exciting habitat through the species associated with it.

Acknowledgements

The workshop is part of a wider project called "Butterflies and Moths mean Business", which is generously funded by the European Community through the Lomond and Rural Stirling, and Cairngorms LEADER + programmes, the Cairngorms National Park Authority, Scottish Natural Heritage and Stirling Council.

Many thanks to Chris Waddell (Biodiversity Officer for Stirling Council Area) and Dave Wainwright (Butterfly Conservation Northern England) for their invaluable contribution to the workshop, to Kate Sankey (West Moss-side Farm) for providing the venue and refreshments, and to the five volunteers who took part in the survey: Dan Baker, Judith Neil, Kate Sankey, Roy Sexton and John Snodin.

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Figure 2 The Large Heath Butterfly. Roy Sexton.

AUTHOR ADDRESSES

Mike Bell, 48 Newton Crescent, Dunblane FK15 0DZ

Neil Bielby, 56 Ochiltree, Dunblane FK15 0DF

John Harrison, 14a Abercrombie Place, Stirling FK8 2QP

Drew Jamieson, 5 Cramond Glebe Road, Edinburgh EH4 6NP

Craig Macadam, Bradan Aquasurveys, 109 Johnston Avenue, Stenhousemuir
FK5 4JY

Ken MacKay, Hayford House, Hayford Mills, Cambusbarron FK7 9PJ

Lorna Main, Stirling Council, Viewforth, Stirling FK8 2ET

David Pickett, Scottish Natural Heritage, Beta Centre, Innovation Park, The
University of Stirling FK9 4LA

Roy Sexton, 22 Alexander Drive, Bridge of Allan FK9 4QB

Julie Stoneman, The Flat, Riemore Lodge, Butterstone, Dunkeld PH8 0HP

Andre Thiel, 6 Tait Place, Tillicoultry FK13 6RU

CLACKMANNANSHIRE'S PONDS – A HIDDEN TREASURE

Craig R. Macadam

Clackmannanshire has approximately 60 ha of standing open water. The majority of this habitat (75 %) is found at Gartmorn Dam, while the remaining water bodies consist of rather small, scattered ponds (Thiel and Lindsay, 1999). The Clackmannanshire Biodiversity Action Plan (Consultation Draft) identifies the need for a comprehensive survey of the ponds in Clackmannanshire to confirm the extent and wildlife value of this important habitat.

For the purpose of this survey, ponds were defined as "A body of standing water, 1 m² to 2 ha in area, which holds water for at least four months of the year" (Collinson, et al., 1995) and included both man-made and natural waterbodies. Using this definition it is estimated that Clackmannanshire has approximately 15 ha of ponds. The majority of these ponds are in the productive lowland areas, however some ponds can be found at altitudes of over 600 m.

Apart from three ponds surveyed as part of the Operation Brightwater project in 1991 (Lassiere, 1993), there is little detailed information on the extent and wildlife value of this important habitat.

During 2004 and 2005, Bradan Aquasurveys Ltd. was commissioned to explore the condition and diversity of the macro-invertebrate and macrophyte fauna of a representative selection of ponds.

The ponds in Clackmannanshire have a variety of different origins. Some are natural sinks filled by seasonal rains that may dry out in summer while others are of artificial construction. They can be ornamental landscape features such as at Inglewood, Gean House or Castleton; stock watering holes such as at Craighton Farm or industrial water sources such as the Delph Pond.

The project commenced in February 2004, with the majority of fieldwork taking place between the end of June and mid-August 2004.

The final report on the pond survey, together with management recommendations will be delivered later this year, and a full report will be made in the 2006 issue of the Forth Naturalist and Historian. In the meantime readers may be interested in the following highlights:

- Twenty-two ponds were visited, nineteen ponds surveyed.
- Two upland ponds had been filled with stones washed down the Ochils.
- One lowland pond had reverted to grassland.
- A total of 68 macro-invertebrate taxa and 43 macrophyte taxa were recorded.
- Newtlets were recorded from four ponds.
- Toadlets and froglets were recorded from three ponds.
- The Red Data Book (Vulnerable) mud snail – *Omphiscola glabra* – last

recorded from Clackmannanshire in 1936, was found in a pond south of Dollar.

- A new vice county record of the ramshorn snail – *Planorbarius corneus* was made from a pond near Muckhart.
- Six locally rare (found in less than ten 5 x 5 km squares in the three Perthshire vice-counties) macrophytes were recorded: sea club-rush (*Bolboschoenus maritimus*); greater tussock sedge (*Carex paniculata*); lesser sea spurrey (*Spergularia marina*); rigid hornwort (*Ceratophyllum demersum*); red pondweed (*Potamogeton alpinus*) and unbranched bur-reed (*Sparganium emersum*).
- Small pearl-bordered fritillaries (*Boloria selene*) were recorded from two sites.

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Figure 1 The pond at Brucefield.



Figure 2 The pond at Woodland Park.

CARRON VALLEY RESERVOIR ANALYSIS OF A BROWN TROUT FISHERY

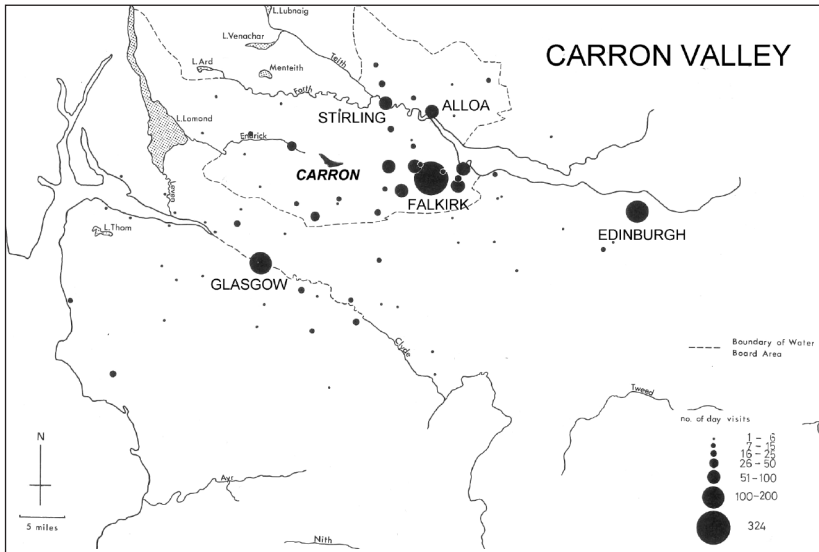
Drew Jamieson

*This vale of peace, where Carron flows
And "peesweeps" cry so weird and sweet
Where whin and broom and gowan grows
And hills stretch up the sky to meet.*

James Adam, 1941

Carron Valley is a large upland reservoir of 970 acres (390 ha), lying at an altitude of 738 ft (225 m) in the Campsie Hills, between Stirling and Glasgow. It impounds the upper reaches of the River Carron and part of the upper River Endrick at the west end.

As a trout fishery, Carron traditionally serves a large customer base across Central Scotland. Map 1 shows the location of Carron Valley and its relationship to its customers when it was managed by the Mid-Scotland Water Board in 1970. The majority came from the Falkirk/Stirling/Clackmannanshire area but significant numbers travelled from Edinburgh and Glasgow and small numbers from even further afield.



Map 1: Location of Carron Valley Fishery and its customer base in 1970

THE WATER SUPPLY

The water sources in the Carron valley have been exploited since the late 19th century but it was only in the years immediately after the Second World War that the catchment started to expand towards what it is today. This was mainly to meet the needs of the rapidly growing petrochemical industry at Grangemouth, as well as the considerable expansion of the dyestuffs industry already in the area.

Carron Valley Reservoir was officially opened on 14 July 1939 by the Right Honorable John Colville MP, the, then, Secretary of State for Scotland. Mid-Scotland Water Board managed it from the 1960s until local government re-organisation in 1975, when it was transferred to the Water Department of Central Regional Council. In 1996 it was transferred to East of Scotland Water and incorporated into Scottish Water in 2002.

Carron Valley is a major water supply. Taken in conjunction with the five smaller reservoirs nearby, Carron Valley now represents the third largest impounded water source in Scotland. The original water level was raised by 1.6 feet (0.5 m) in 1987 to increase the capacity to 506 million gallons (2300 m litres). Only the Loch Lomond and the Loch Katrine schemes are larger. Carron Valley itself can supply up to 27.5 million gallons per day (125 Megalitres per day) to domestic and industrial customers in the council areas of Stirling, Falkirk and East Dumbartonshire. The water feeds from the reservoir, by gravity, to the main water treatment works at Carron Valley, opened in 1998, and at Gartcarron, at the west end. In addition, the reservoir has to release compensation flows into the River Carron, at 6 million gallons per day (30 Megalitres per day), and into the River Endrick, at 0.25 million gallons per day (1 Megalitre per day)

More Than Just Water

Although the primary purpose of the reservoir is a water supply source it is also a major landscape feature; a habitat for wildlife; an opportunity for recreation and a major brown trout fishery, all within easy access to the major conurbations of Central Scotland. As a wildlife habitat the reservoir provides a large area of clean, open water which attract many water birds, including a large colony of black-headed gulls (*Larus ridibundus*), great crested grebe (*Podiceps ruficollis*) and osprey (*Pandion haliaetus*) in summer and bean geese (*Anser fabalis*) in winter. As a working reservoir the regular draw-down of water limits the production of aquatic vegetation and can reduce the nesting success of some waterfowl. In the surrounding area are pine martens (*Martes martes*), red squirrels (*Sciurus vulgaris*) and grey squirrels (*Sciurus carolinensis*), mink (*Mustela vison*), otter (*Lutra lutra*) and roe deer (*Capreolus capreolus*).

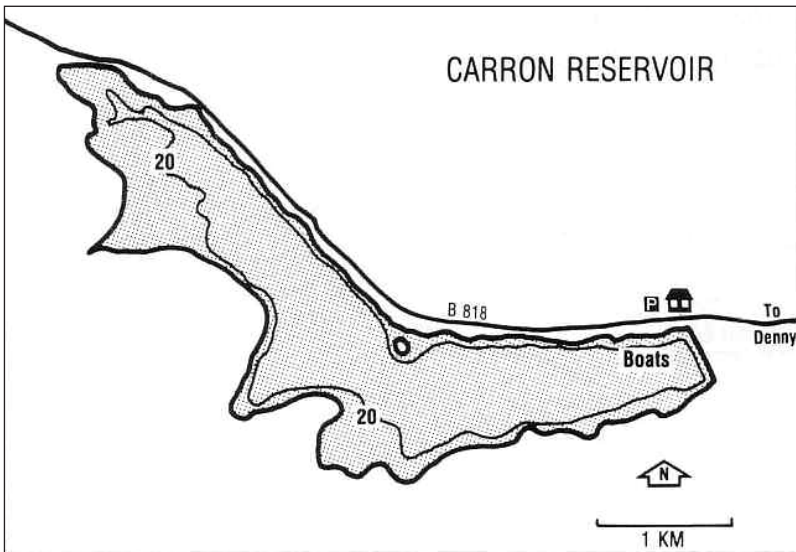
The scenic qualities of the reservoir can be appreciated from the B818 Denny to Fintry road which provides a popular weekend drive. The Forest Enterprise woodlands covering the southern half of the catchment have good access for walkers and cyclists, catered for by a car park. As one of the largest water

bodies in Central Scotland, it has the potential to accommodate a range of quiet water sports such as sailing, canoeing and rowing. However, Carron Valley is also well known as one of Central Scotland's best populations of wild brown trout (*Salmo trutta* L) and, since 1989, has been a *safeguard site* for a population of powan (*Coregonus clupeioides*), translocated from nearby Loch Lomond, where they had become endangered. The recreational fishery for the brown trout and the development and management of this resource is the subject of this paper.

THE TROUT FISHERY

The Reservoir as Habitat

The reservoir covers some 970 acres (390 ha) at an altitude of 738 feet (225 m) above sea level. It is approximately 3.5 miles (5.6 km) long and 0.5 miles (0.8 km) wide with an irregular dog-legged shape. It is aligned in a generally west-east direction and is open to prevailing westerly wind and strong north-westerly gales (Map 2).



Map 2: Configuration of Carron Valley Reservoir.
(Depth contour at 20 ft (6 m))

It is therefore a large, exposed upland water where the fishing is frequently affected by strong winds. It is a relatively shallow water. Maximum depth at the Randieford (west) end is 25 feet (7.6 m) and 38 feet (11.5 m) at the Craignannet (east) end. Large areas are less than 20 feet (6 m) deep. This makes it a relatively rich habitat for invertebrates, which provide good feeding for the trout. As a working reservoir there is regular annual draw-down which exposes large

areas of the littoral. This has an adverse effect on aquatic vegetation and invertebrates and on trout growth. The extent of the drawdown varies from year to year depending upon rainfall and customer demand. In 1997 drawdown started in early-April and reached -2.7 m (9 feet) by mid-October. Much of the reservoir is underlain with boulder clay and peat. Wave action on the boulder clay produces gravel and loose stones, which form a feature of the littoral habitat. As a result of raising the water level in 1987 there is still active erosion along the shoreline. As expected in a supply source the water quality is good. The pH, in 1984, was slightly acid, at 5.91, with a total hardness of 26 mg^l⁻¹ and an alkalinity of 0.3 mg^l⁻¹.

The littoral invertebrate population contains a wide variety of species and gives satisfactory diversity scores of 0.817 for Qualitative and 0.781 for Quantitative indices. (Macadam,1997). Species include freshwater shrimp (*Gammarus*) and hog louse (*Asellus*), water fleas (*Cladocerans*), copepods (*Cyclopoidea*), midge larvae (*Chironomidae*); claret dun nymph (*Leptophlebiidae*); brown sedge (*Limnephilidae*), black silverhorn (*Leptoceridae*) and needle fly (*Leuctridae*). Also present were tubifex and nematode worms, aquatic snail (*Planorbis*) and aquatic beetle. (*Dytiscidae* spp)

The Catchment

For wild trout populations, the catchment of the reservoir is as important as the reservoir itself. Brown trout leave the reservoir in the autumn to spawn in the tributaries. The young trout hatch out in the gravel and spend one to three years living and growing slowly in the tributary streams. After one, two or three years they migrate downstream to the reservoir for a phase of rapid growth leading to maturity and the cycle is repeated. Water quality, feeding and shelter in the catchment tributaries are therefore vital to a healthy trout population in the reservoir.

The catchment covers some 38.7 k² and is drained by a number of streams including the upper reaches of the Carron and Endrick. A large part of the catchment has been forested since 1942 and the development and management of the forests is important for the fishery. The water authority has maintained close cooperation with the Forestry Commission on pesticide use but it is not clear whether other potential impacts, such as fertilisers and suspended solids, have been actively monitored. The nursery streams appear to be healthy. Buffer zones keep the coniferous trees away from the water's edge and populations of invertebrates appear to be sound (Macadam, 1999). The remaining land is predominantly used for sheep grazing. While the water quality in the reservoir is good, there is a suggestion that algae have increased over the years and this could have a detrimental effect on the fishery, by reducing visibility for trout seeing the anglers' flies and encouraging trout to feed on bottom-living invertebrates.

The Brown Trout

The creation of the dam effectively trapped the indigenous wild brown

trout in the upper River Carron and its tributaries. These grew and thrived on the rich feeding of the newly-flooded fields. In 1940 the new reservoir was additionally stocked with 50,000, one-year old brown trout and opened for angling in 1942 with six boats. In the first season some 1480 anglers caught 9620 trout, giving an angling-success of 13 trout per permit, at a mean weight of 13.5 ounces (383 gm). This indicated the large population and good growth rate of trout in the newly-flooded reservoir. From time to time since 1942 the reservoir has been stocked with juvenile trout (one- and two-year old), below the takeable size for angling, of ten inches (25 cm). These would be expected to grow on in the reservoir to provide catches in future years. In 1989 a small sample of 21, apparently wild, trout showed a mean fork-length of 290 mm (11.4 in) with a range from 245-350 mm (9.6-13.7 in). Scale-reading indicated they were three and four years old, having grown quite well in the reservoir after spending two years growing slowly in the nursery streams. The weight-frequency distribution in 1992 of a sample of 591 trout is shown in Figure 1.

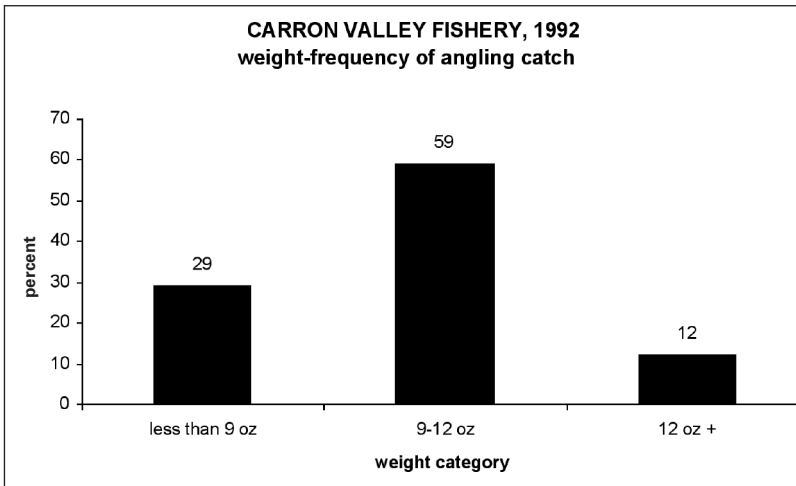


Figure 1 Weight-frequency of a sample of the angling catch, 1992 (n=591)

The figure shows a good head of trout (71 %) in the takeable size range in excess of 9 oz (255 gm). There was an adequate recruitment, with (29 %) of younger fish below the takeable size but a limited survival of trout (12 %) into the higher weight classes in excess of 12 oz (340 gm). (Jamieson, 1992). Since 1994 the reservoir has been stocked with larger trout, of a size takeable by anglers in the same season they were introduced to the reservoir.

Administration and Permit Sales

Over the years the arrangements for booking and selling permits for the fishery have varied. From 1942 until 1976 permit sales faced a number of

restrictions. No bank fishing, nor Sunday fishing, was allowed. Daily boat permits were issued but they had to be booked in advance. The initial allocation of permits was by ballot, before the start of the season, with some restrictions. Only eight permits were allowed per person each season and Saturday permits were restricted to ratepayers within the Board's area of Stirlingshire, Clackmannanshire and East Dumbartonshire (Map 1). Block booking for angling clubs were not accepted. Once the initial postal applications were satisfied bookings were opened to the general public. The charges for fishing were also differentiated in favour of the Water Board's rate-payers.

In 1970, for example, the charge for residents was £1.00 per boat per day, as against non-residents at £1.50. The fishing season was of 126 days duration, excluding Sundays. With twelve boats and two rods per boat, the potential fishing effort was 3024 rod-days for the season. The initial postal ballot generated a demand for 1265 permits (2530 rod-days) and a further 494 permits (858 rod-days) were allocated throughout the season bringing the total fishing effort to 1456 permits (2912 rod-days.) (Jamieson, 1972).

From 1976, Central Regional Council continued the ballot system and there was no bank fishing nor Sunday fishing. The 1988 season, for example, opened on 11 April and closed on 17 September. The ballot allowed only six permits per applicant and only one Saturday per season. Half-day permits were then available, from 16 May to 6 August, with sessions running from 9am to 4pm and from 4.30 pm to 9 pm. There was still a differential charge between residents and non-residents but there were concessions for Old Age Pensioners and Unemployed. Outboard motors could be hired.

Between 1989 and 1993 proposals for a National Centre for Game Angling, to be based at Carron, were developed by the Scottish Anglers' National Association (SANA) and the, then, Scottish Sports Council (now Sportscotland). Although a Development Plan was prepared (Jamieson, 1992), this project was not taken forward. However, for the 1994 season, Central Regional Council introduced a number of the recommendations, including the policy of stocking larger, takeable-sized trout and improvements to the facilities and their management. These changes resulted in the significant increase in permit sales.

A proposed charitable trust, involving Central Regional Council and Clackmannan District Council, prior to local government re-organisation in 1996, failed to be approved and the fishery passed to East of Scotland Water in April 1996. It passed on to Scottish Water on reorganisation in 2002 and, in 2003, Scottish Water offered it for lease. In 2004 it opened as a commercial fishery.

Fishing Effort

Figure 2 shows the fishing effort expressed as the number of boats available and the number of permits sold from 1942 to 1999. (There is no differentiation between day and half-day permits.)

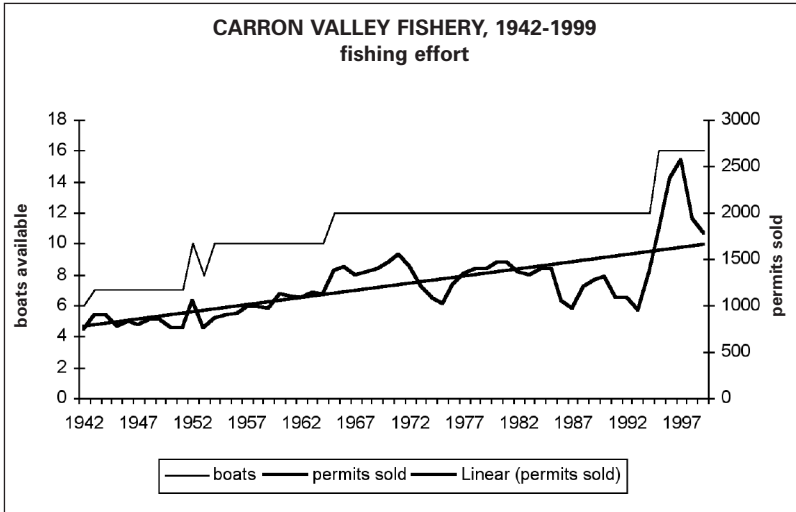


Figure 2 Fishing Effort 1942-1999

When the fishery opened in 1942 the six boats generated 740 permits, which, with 2 anglers (rods) per boat, gave a fishing-effort of 1480 angler-visits. Boats were increased to seven in 1943 and, in stages, to 16 in 1994. Although the trend suggests a progressive increase from 1942 to 1999, the detailed graph shows a marked change occurring around 1994. From 1942 until 1994 permit sales fluctuated between 760 in 1953 and 1560 in 1971, with a general upward trend in boat numbers and bookings. However there was a marked increase in sales in 1995 to 1796, peaking at 2563 in 1997, following radical improvements to the fishery. These permit sales were not sustained and fishing effort reduced again in 1998 and 1999.

Cropping and Stocking

Anglers' catches were weighed-in at the hut behind the car park under the supervision of the reservoir attendant. From 1942 until 1995, all trout caught were recorded in "lbs and oz" as a "basket", e.g. six trout weighing 5 lb, rather than as individual fish. The catches were recorded in a book and summarised each year. The data available include total number of trout caught, total weight of trout caught, mean weight of trout and number of trout caught per permit. In 1992 the SANA pilot project recorded the weights of individual trout and from 1996 East of Scotland Water introduced catch return cards, which recorded individual fish, as standard practice. Over the years the methods of catching have been remarkably consistent. Fly-fishing has been the only permitted method and the size-limit has remained at 10 inch (25 cm). The generous bag-limit of 30 trout per boat was reduced to 15 in 1995, but the effect of this is unclear.

Carron Valley fishery depends very much on its wild trout population for its catches and this natural population must be conserved and managed. Figure 3 shows the numbers of trout caught and stocked in Carron Valley from 1942 until 1996.

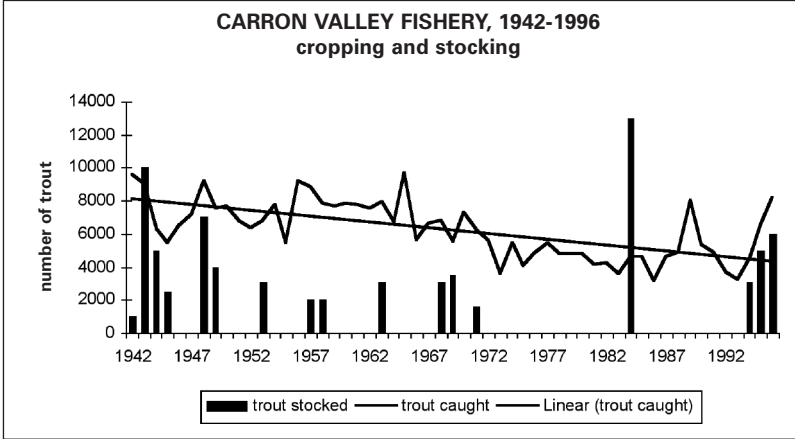


Figure 3 Cropping and stocking, 1942-1996

From 1942 to 1994 the trend in the numbers of trout caught has been downwards. Following the initial stocking of 50,000, one-year old brown trout in 1940, further one and two-year-old trout were stocked each year between 1942-45. These would take from one to two years to grow to the takeable size of 10 inches (25 cm). After a two-year gap stocking of juvenile trout continued on an irregular basis until 1971. By contrast, from 1994 onwards, trout in excess of the takeable size were stocked, with up to 6000 introduced in 1996.

The effect of stocking juvenile fish upon the anglers' catches is unclear from Figure 3. In the initial years, from 1942-1945, the number of trout caught declined sharply, as would be expected as the feeding and growth potential in the new reservoir reduced. The recovery from 1946 to 1948 could be the effects of the juveniles stocked in 1943 and 1944. Similarly, the peaks of 9660, in 1965, and 7300, in 1970, could be reflections of the two-year-olds stocked in 1963 and 1969 respectively. There is no record of stocking between 1977 and 1984, when 13000 two-year-olds were introduced to arrest the apparent decline in catches. This produced no apparent effect. The sharply increased catches to 8053 in 1989 could have been the result of raising the reservoir top water level by two feet in 1986. The direct effect of stocking the takeable trout from 1994 onwards is clearly shown by the increased catches from 1994-1996.

Angling success

However, the angling catch has to be related to the fishing effort invested to

achieve it. Figure 4 shows the angling success (catch-per-unit-effort), described as trout-per-permit, in relation to the stocking programme.

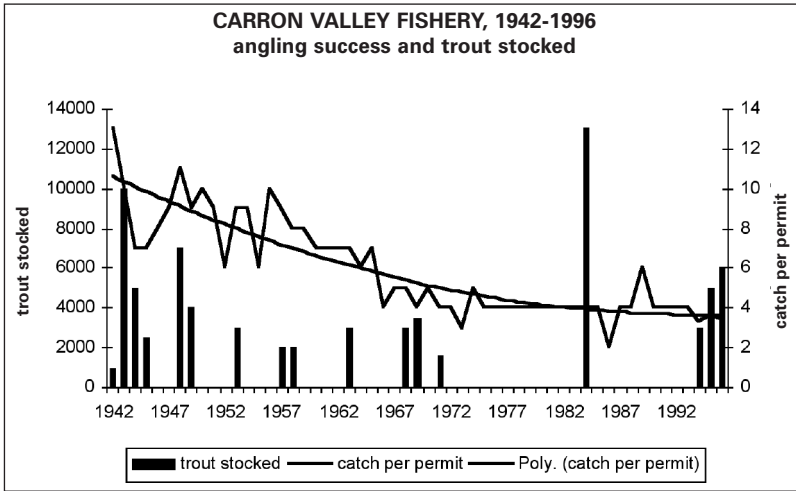


Figure 4: Angling success and trout stocked, 1942-1996.

The graph shows angling success following a similar downward trend to the total catch, but with a steeper decline in the earlier years and a levelling-off later. A polynomial trend-line gives a better fit. Despite the stocking of juvenile trout, angling success declined from a high of 13 in 1942 to a low of 2 in 1986. Since 1975 it has settled around 4, even after the intensive stocking of takeable-size trout since 1995.

Weight of Trout

Figure 5 shows the total weight of trout caught in Carron from 1942-1994 in relation to the mean weight of individual trout. While the total weight shows a decline similar to the trout numbers and catch-per-permit the weight of individual trout declined from 1942 until 1966, then recovered until 1992. Although the mean weight over the period is 11 oz (312 gm), a polynomial trend line gives the best fit. The continued decline in total weight caught after 1966 must be due to reduced numbers of trout caught rather than the size of the trout.

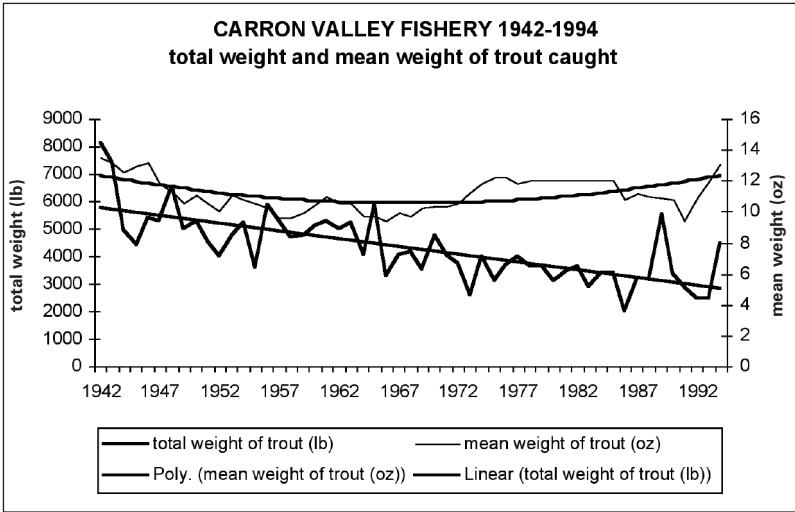


Figure 5 Total weight and mean weight of trout caught, 1942-1994

Effectiveness of Stocking

From 1942 until 1993 Carron Valley was effectively a wild trout fishery, supplemented with juvenile hatchery-reared brown trout. From the data, the benefits of such stocking are difficult to identify, in terms of total trout caught, trout-per-permit and total weight of trout caught. From 1994 onwards the fishery has been operated more on a *put and take* basis and the stocking of *takeable-sized* trout has produced an identifiable effect on catches and short-term permit sales but has not increased angling success in terms of catch-per-permit. The stocking of large upland reservoirs has been questioned on economic and ecological grounds. (Crisp and Mann, 1977).

Possible reasons for decline

From 1942-1993 Carron has depended largely on its wild trout population. Figures 2-5 demonstrate the decline in the catches. There are a number of possible reasons for this, few of which can be quantified at this stage:

- The establishment, growth and operation of forests has been shown to have an adverse effect on fisheries in other parts of Scotland. (Best, 1994);
- An increased annual draw-down of water levels, as demand increased from 1942 onwards, could have reduced the productivity of the reservoir. (Smith et al, 1987);
- A progressive enrichment of the reservoir, over the years, can lead to increased algal growth, which alters the ecology of the water body and adversely effects fly-fishing (Bailey-Watts (1994);

- The increasing fishing effort from 1942-1994 may have been too great for the wild trout population to sustain.

The most consistent data, illustrating the decline in trout catches, was collected by the Mid-Scotland Water Board for the period from 1942-1977. (Fellows, 1978). If the exceptional results from the newly-flooded reservoir between 1942 and 1944 are discounted, Figure 6 shows the relationship between fishing effort (permit-sales) and the angling success (catch-per-permit) in the more stable reservoir habitat from 1945-1977.

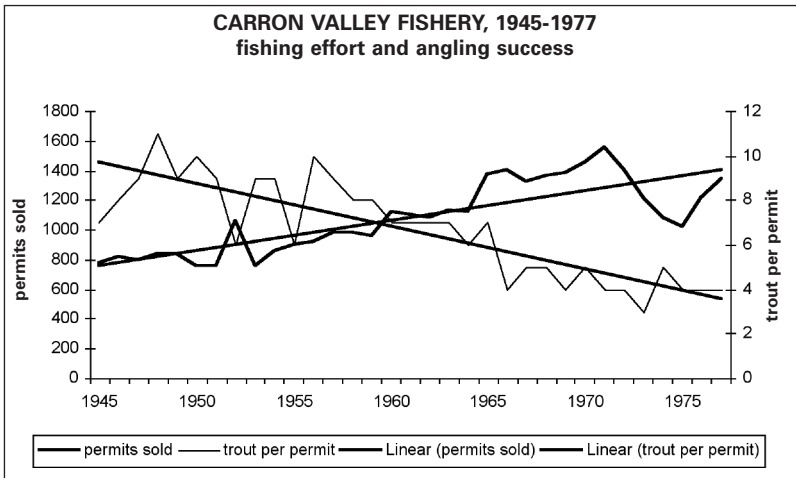


Figure 6 Relationship between fishing effort and angling success, 1945-1977

This shows a decline in angling success as fishing effort has increased. The trend lines intersect about 1959, when a fishing effort of 960 permits produced an angling success of eight trout-per-permit. This produced a catch of 7680 trout for a total weight of 4752 lb (2155 kg) at a mean weight of 9.9 oz (280 g). Beyond this level of fishing effort the angling success declined further. This may have been the optimum fishing effort and level of cropping that the wild trout population at Carron Valley could have sustained, at that time, and still give satisfactory angling success, without artificial stocking. This suggests that the continued decline in catches at Carron could be due to over-fishing of the wild trout population.

This thesis is supported by Figure 7, which shows a correlation ($r^2 = 0.6207$), between fishing effort (permits sold) and angling success (trout-per-permit) from 1945 to 1977.

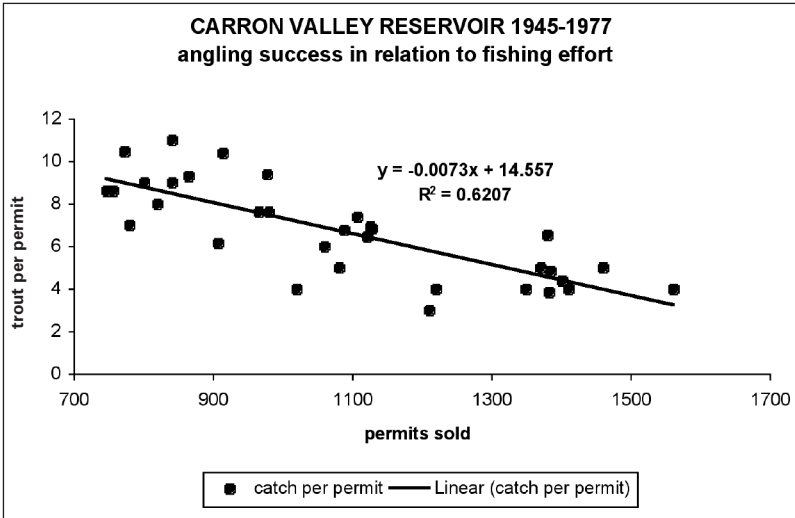


Figure 7 Relationship between fishing effort and angling success 1945-1977

The Future

Carron Valley is a major reservoir for water supply, wildlife, landscape and recreation, located close to Scotland’s main centres of population. Its trout fishery provides sport for a large number of anglers each season. The fishery depends very much on its wild trout population and this natural population must be conserved and managed. Fishing-effort has increased over the years and trout catches have declined. While there is a correlation between these sets of data, this does not necessarily prove a causal relationship. Other factors may be implicated in this decline. Stocking with juvenile hatchery-reared trout has shown little benefit in the past and the policy, since 1994, of stocking *takeable-sized* trout needs longer-term evaluation on, both, economic and ecological grounds.

Since 2004, the new tenant has committed to re-creating Carron as “Scotland’s premier brown trout only water”. To assist the wild trout, a planned programme of maintenance of the spawning and nursery streams has been agreed with the Forestry Commission, to ensure that there is maximum access for spawning trout within the forested area. Environmental education and practical trout conservation is being promoted by involving the local youth angling club, “Carron Valley Ospreys”, in clearing spawning streams in the autumn. For the angling customers, facilities and infrastructure have been improved and the policy of stocking *takeable-sized* brown trout, is being continued, but with greater numbers and at a larger size, than previously. The trout are also stocked more frequently to spread the benefits throughout the fishing season. The policy of *catch-and release* of wild trout is being promoted, particularly for competitions. The endangered powan have settled in well at

Carron. Some 82 have been caught and returned by anglers in the past two years. More than half are estimated to weigh in excess of 2.2 lb (1 kg), with some estimated at between 3 and 4 lb (1.5 kg).

In 1964 Tom Stewart wrote about Carron: “*The Water Board probably did not realize that they were creating one of the best trouting lochs in Central Scotland, but this is what they certainly did.*” Future data may confirm whether the fishery is being restored to its former pre-eminence.



Figure 8 Too windy for fishing – boats in dock with Meikle Bin in the background.

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FORTH AREA BIRD REPORT 2004

A.E. Thiel, M.V. Bell and N. Bielby

The present report is the 30th bird report for the Forth Valley (or Upper Forth) bird recording area. The report was written by Neil Bielby (Red-throated Diver to Coot), Mike Bell (Oystercatcher to Razorbill) and Andre Thiel (Feral Pigeon to Reed Bunting and escapees) with Cliff Henty contributing to the wader accounts. Cliff remains the Bird Recorder and all data should be sent to Cliff in the first instance.

The main part of the report consists of detailed species accounts presented in a systematic list. This is preceded by a summary of the main bird news from the past year and additional sections on the Wetlands Bird Survey (WeBS), written by Neil Bielby, and a Ringing Report, compiled by Andre Thiel. The bird report no longer contains a section on weather. A detailed account can, however, be found elsewhere in this volume.

ROUND-UP OF THE YEAR

The highlights of the year were no doubt a drake Lesser Scaup at Gart Loch on 19th June and an adult White-winged Black Tern at Skinflats between 12 and 14th August, both new species for the recording area.

The start of the year saw the continuation of the large Raven roost at Braes of Doune with 70 birds present in early January. There were increasing numbers of reports from the Callander-Doune-Dunblane area, which seems to indicate that the species is spreading south-east, though this is not (as yet) reflected in an extension of the breeding range. Red Kites are also roosting in large numbers in that area with 45 birds on 17th January. Birds at Argaty include birds from the north of Scotland, Dumfries & Galloway and North Yorkshire release sites. Smews at Loch Katrine on 17th February and at Loch Arklet between 15th and 28th March brought a bit of colour to late winter. An increasing number of winter reports of Barn Owls from the core south-east Stirlingshire area and from the adjoining Falkirk and Clackmannanshire areas seems encouraging and may indicate a consolidation and expansion of this population, though the high number of road casualties may play against this trend.

A taste of spring came in the form of three Avocets at Kinneil on 15th April. This was followed soon after by a Marsh Harrier at Skinflats on 7th May. The end of May saw the only spring Curlew Sandpiper, a bird moulting into summer plumage, at Kinneil on 31st. After last year's birds at Cambus, Skinflats and Kinneil, June saw another Little Egret at Blackness on 15th. This handsome heron is continuing its spread in southern Britain and it can only be a matter of time before we see the first breeding attempts up north.

Autumn migration started in style with a Temminck's Stint at Skinflats on

3rd to 4th July. This was followed there in mid-August by the very rare sight in our area of Black and White-winged Black Terns together. This was complemented by a Mediterranean Gull at Kinneil on 13th August.

October saw a Waxwing invasion which lasted into mid-2005. Flocks in excess of 1,100 birds were counted in Aberdeenshire. By the time these birds arrived further south they had dispersed into smaller flocks. Nonetheless large flocks were recorded in the major conurbations of Dunblane, Stirling, Falkirk and Grangemouth, with the largest flock numbering 500 birds in Dunblane.

The Bean Goose flock on the Slammanan plateau continues to thrive with a record 262 birds on 13th November. This flock has established itself as the largest flock in Britain and the Scottish Executive initiated consultations in March 2005 on designating the Slammanan plateau as a Special Protection Area (SPA), a European designation offering the highest level of protection a site can get. The introduced Canada Goose is doing equally well, with 294 at Loch Coulter on 15th September the largest ever recorded flock in the recording area.

The year came to an end with an exceptional flock of 570 Twite in Dunblane on 7th December, 4 Northern Bullfinches – part of another influx – on 28th December in Doune and Mediterranean Gulls at Airth on 3rd and 28th December.

Annual Bird Reports depend largely on contributions from the local birdwatching community. As far as possible these are acknowledged with initials with a full list of contributors included at the start of the report. More contributors than ever (97) have sent in data this year. There is not surprisingly an ever increasing amount of data reaching the editors in various formats. To facilitate the preparation of the report, contributors are strongly encouraged to submit their data as soon as possible after the end of the year. Electronic files are much the preferred format and a standard spreadsheet is available from Cliff Henty.

The increasing number of records that are submitted with six-figure grid references is much appreciated, as this enormously speeds up cross-checks and is a valuable resource for conservation action. It would be equally appreciated if contributors could add the name of the nearest village or town where birds are reported from isolated localities that may not be widely known, such as farm steadings, etc.

The sparse information available about common breeding species is improved by data from the Breeding Birds Survey (BBS). For less common species data can sometimes be summarised in terms of the numbers of pairs or apparently occupied territories for particular locations. The organisers for both the estuary and the inland waters parts of the national wildfowl counts (WeBS) have made available the results for this report. These often contribute to the species accounts and there is also a separate summary for inland waters which concentrates on localities.

Several observers send in a list largely or entirely for their home locality. Much of this information is not appropriate for inclusion in these annual reports but it is valuable to have on record (e.g. for conservation action) these are kept in a special file. At the moment there are fifteen such lists referring to the whole district from Falkirk to Killin.

For many species the records sent in are very unrepresentative of their general distribution. This applies particularly to very common species or to those that are secretive or breed in inaccessible locations. The status of species is detailed in a Check List, published in the Forth Naturalist and Historian, Vol 15. Additional information along with guidelines for the submission of records can be obtained from N. Bielby, 56 Ochiltree, Dunblane, FK15 0DF. (01786 823830, neil.bielby@tiscali.co.uk.). In addition we have in this report put a coded summary of general distribution after the species name. This often apparently contradicts the detailed records that are published for the year. The codes are thus:

- B - Breeding status, widespread (in more than five 10 km squares)
- b - " " , local, scarce (in fewer than five 10 km squares)
- W - Winter status, widespread or often in groups of more than ten
- w - " " , local, scarce (local and usually fewer than ten in a group)
- P - Passage (used when species is usually absent in winter, P or p used for widespread or local as in winter status)
- S or s - a few species are present in summer but do not normally breed.

Thus BW would be appropriate for Robin, B for Swallow, p for Ruff and SW for Cormorant. No status letter is used if a species occurs less than every other year.

An asterisk (*) in front of the species name means that all records received for scarce species have been quoted. The SOC has pressed for a more systematic vetting of records of species that are unusual locally. Our area now has an informal panel of five members: C. Henty (Recorder), A. Smith, D. Orr-Ewing, A. Blair and D. Thorogood. We have produced a list of species that are scarce locally and where the records need to be supported by either a full description or sufficient evidence to remove any reasonable doubt. The list is available from Cliff Henty. Any species which is a vagrant to the area and most of those which are asterisked in this report will come into this category. Observers should be aware that aberrant individuals of common species of birds appear quite regularly and these sometimes resemble rarities. There is also the problem of escaped birds and of hybridisation, a particular problem in captive wildfowl which may then appear in natural situations. The judging of Scottish or national rarities continues as before and descriptions need to be submitted to the relevant committees.

The following abbreviations have been used : Ad. - adult, AoT - apparently occupied territory, Br. - bridge, BoA - Bridge of Allan, c/n - clutch of n eggs, conf. - confluence, BBS - Breeding Bird Survey, CP - Country Park, Est. - estuary, Fm. - farm, F - Female, G. - Glen, GP - gravel pit, Imm. - immature, incl. - including,

Juv - juvenile, L. - Loch, NR - Nature Reserve, M - Male, Max. - maximum, ON - on nest, Res - Reservoir, R. - river, Rd - road, SP - summer plumage, WeBS - Wetland Bird Survey, Y - young, > flying/flew.

The area covered by the report comprises the council areas of Falkirk and Clackmannan together with Stirling, excluding Loch Lomondside and other parts of the Clyde drainage basin. Please note that we do not include the Endrick water, i.e. Fintry and Balfron. Records from Carron Valley Reservoir are published here but it is proposed that Clyde should cover all the forest south of the reservoir.

This report has been compiled from records submitted by the contributors listed below. Where no initials are given in brackets, contributors participated in targeted surveys (e.g. WeBS) but did not additionally submit data to the systematic list.

D Anderson (DA), M. Anderson (MA), S. Ashworth (SA), A. Ayre (AA), B. Barker (BB), Bean Goose Study Group (BGS), P. Beattie (PB), D. Bell (DB), M. Bell (MVB), N. Bielby (NB), Bird News Services (BNS), A. Blair (AB), L. Bowser (LB), R.A. Broad (RAB), R. Bullman (RB), J. Calladine (JC), D. Cameron (DJC), P. Carter, Central Scotland Black Grouse & Capercaillie Group (CSBG&CG), D. Chamberlain (DC), R. Chapman (RC), D.&A. Christie (DAC), N. Credland (NC), N. Clark (NDC), R. Darsley (RD), R. Daley (RiD), R. Dalzeil, R.&H. Dawson (RHD), S. Dick (SD), R. Downie (RD), D. Egerton (DE), D. Orr-Ewing (DOE), G. Fraser, K. Freeman (KF), J. Gallacher (JG), J. Grainger, R. Griffiths (RG), A. Hannah (AH), M. Hardy (MH), I. Henderson (IH), C. Henty (CJH), A. Jones (AJ), D. Jones, D. Kerr (DK), M. Kobs (MK), B. Kocjan-Brooks (BKB), A. Lauder (AL), G.& E. Leisk (GEL), A. Macfarlane (AMf), M. McCartney (MM), R. McGinty (RM), J. Mallett (CJM), L. Marshall (LM), D.& M. Mason (DMM), D. Matthews (DM), N. Melsom (NDM), J. Mercer (JM), Mugdock Country Park Rangers, S. Muir, J. Nimmo, B. Osborn (BO), G. Owens (GO), F. Pandolphi, E. & J. Payne, D. Pickett (DP), K. Pilkington (KP), L. Pryde (LP), J. Reid (JR), D. Redwood, A. Samson, P.A. Sandeman (PWS), R. Shand (RS), J. Shanks (JS), D. Shenton, H. Simpson (HS), Smith (AS), E. Smy (ES), P. Stirling-Aird (PSA), A. Thiel (AET), D. Thorogood (DT), J. Towill (JT), M. Trubridge (MT), A. Wallace, A. Watterson (AW), H. Weir (HW), C. Wernham, M. White (MW), K. Wilkinson (KW), J.N. Willett (JNW) D. Wilson (DW) and K. Wilson.

Thanks are also due to D. Orr-Ewing for RSPB data on Red Kites and Ospreys, to P. Stirling-Aird for data from the Upper Forth Raptor Study Group and to the Tay Ringing Group (TRG) for data of ringed birds.

CENTRAL REGION WEBS REPORT 2004/5

The Wetland Bird Survey (WeBS) is a monthly waterfowl census organised in the past under the auspices of the Wildfowl & Wetlands Trust (WWT) and from September 2004 onwards under those of the BTO. The core months are September to March inclusive. For this report 'waterfowl' includes divers,

grebes, cormorants, herons, swans, geese (excluding Pink-footed and Greylag, for which the WWT organises separate counts), ducks, sawbills, rails, gallinules and coots. Waders, gulls, raptors & Kingfisher numbers are also collected. Locally we also record Dipper & Grey Wagtail.

Although the WeBS scheme was only officially launched in October 1993, it continues the traditions of two long-running count schemes which had monitored waterfowl numbers in the UK since 1947. Counts in the area covered by this report go back as far as the winter of 1960-1.

When interpreting the various statistics in this report it should be borne in mind that Coot and Great Crested Grebe were not counted until 1982-3, Little Grebe not until 1985-6 and Cormorants not until 1986-7. The three categories of Mallard are, as follows: (i) totally wild receiving no human assistance (ii) wild but assisted in some way by humans, i.e. duck pond birds fed by the public or birds fed by wildfowlers to attract them to flight ponds for shooting (iii) birds in this category owe their existence to humans, being reared by them, released onto shooting ponds and fed.

This report covers the area occupied by the local government councils of Stirling, Falkirk and Clackmannanshire. As this area is identical to that covered by the now defunct Central Region, the latter title has been retained both for continuity and convenience and hereafter referred to as the 'region'.

By the end of July, record forms for 89 still water sites, 104 km of river and 20.2 km of canal had been received from 43 counters who had made 491 individual counts and walked 726.4 km of river and canal bank through the winter.

Still Water Sites

Standing water in Central Region amounts to 7,693 hectares or 2.92 % of the area. The steep rainfall gradient from the NW to the SE of the region is illustrated by the fact that L. Katrine has an average 2,500 mm of rain a year compared to Grangemouth with 890 mm.

The table below shows waterfowl numbers from matched counts at 20 top still sites and four main river sites (sites with Mallard in categories (ii) and (iii) have been excluded) This probably gives the truest indication of overall trends.

Month	Mean 1994-1997	1997/8	1998/9	1999/0	2000/1	2001/2	2002/3	2003/4	2004/5
September	2250	2485	2592	2939	2110	2180	2633	2437	2407
October	3674	3630	2766	4426	3016	2934	3519	3524	3330
November	4115	4075	3625	4465	4565	4129	4526	3957	4213
December	4857	4739	4469	4824	4831	3758	4124	3911	4571
January	4599	4499	4377	4367	4419	3418	4234	4139	4840
February	4175	4021	3289	4155	3761	4274	3467	4022	3566
March	2482	2669	2302	2259	2478	2512	2432	2683	2778
Totals	26099	26118	23420	27435	25180	23205	24935	24673	25705

Turning to individual sites, the top ten along with monthly averages are listed below (figures from previous seasons in brackets):

	Site	Average		Site	Average
1. (1)	Gartmorn Dam	732 (620)	6. (21)	Killin Marshes	167 (68)
2. (2)	Lake of Menteith	616 (493)	7. (7)	Vale of Coustry	148 (212)
3. (3)	Cambusmore/Gart	336 (364)	8. (25)	L. Venachar	140 (53)
4. (6)	Airthrey Loch	272 (253)	9. (11)	St Helen's Loch	135 (138)
5. (5)	Loch Earn	227 (308)	10. (12)	Doune Ponds	117 (137)

Wildfowl numbers at Gartmorn Dam were up 18 % on the previous year but still some 17 % down on the LTA (long-term average). The Lake of Menteith had its highest ever count with 903 birds in Nov. This helped it towards its best ever year, with the monthly mean up 86 % on the LTA. Goldeneye numbers were at record levels there. With extraction in full swing from the Gart fields, numbers were a little depressed on previous years. Birds present on L. Dochart/L. Lubhair were only 56 % of the norm but further down the glen, Dochart Haughs & Killin Marshes had their best ever seasons, with numbers up 125 % & 158 % respectively. L. Venachar recovered to normal levels after the abnormally low counts of the previous winters with L. Watston also 27 % up on the LTA. Wildfowl numbers at Carron Valley Res. were at an all time low with a mean of 58 birds, only 20 % of the LTA. This was almost certainly due to persistently high water levels. Numbers in the Strathblane area were at the top end of the 10-year range.

Linear Water Features: Rivers and Canals

Coverage of the rivers system was the same as the previous winter but still 17 % down on the best season. The upper Forth between Gargunnoch Br.-Ladylands went uncovered. The Teith was counted from its confluence with the Forth up to Drumvaich, although species & numbers are few upstream of Wester Row. A 4 km stretch of the Devon between B 934 and Crook of Devon was counted for the first time. Coverage on the canals was good but bird numbers have still not recovered from the disturbance caused by the restoration work, especially on the Union Canal, where Moorhen numbers are only 14 % of the 1997-2000 mean.

	Birds/Linear Km									
	1995/6	1996/7	1997/8	1998/9	1999/0	2000/1	2001/2	2002/3	2003/4	2004/5
Allan Water	—	3.7	7.1	14.2	12.2	12.0	10.6	10.6	12.3	9.8
R. Avon	—	3.7	7.0	7.4	10.2	9.9	6.8	7.9	10.4	—
R. Carron	—	10.4	11.2	12.6	13.4	13.1	15.1	18.8	22.1	14.6
R. Devon	11.4	11.2	8.3	9.5	15.0	15.2	15.1	17.2	17.2	17.4
R. Forth	25.2	17.8	14.1	15.5	19.0	17.0	23.4	27.7	14.4	13.9
R. Teith	—	22.7	16.0	8.9	22.1	17.2	36.6	25.5	35.6	18.4
Endrick Water	—	34.1	58.9	50.4	79.2	36.5	—	—	31.6	27.5
Canals	5.1	5.5	5.9	7.2	6.8	5.1	4.6	3.7	4.6	5.
Overall		13.8	11.8	13.5	16.4	14.1	16.1	17.5	16.6	13.1

Once again, many thanks to all for their time and often considerable efforts (especially along the river banks in September and at times of flooding!).

RINGING REPORT

This is the first full ringing report. The following section lists all ringed birds seen in the recording area during the year (as well as some from previous years, where of interest). Contributors are encouraged to report colour-ringed wildfowl to the relevant organisers and/or the BTO and not to assume that somebody else has already done so, as all movements are of interest to the ringers and add to our understanding of bird ecology.

A total of 25 recoveries (excluding multiple sightings of the same bird) were made in 2004. Most are, not surprisingly, of Greylag Geese (8) and Mute Swans (14), with one each of Whooper Swan, Pied Flycatcher and Blue Tit.

Allan and Lyndesay Brown, who are ringing Mute Swans in Fife and the Lothians, are particularly keen to learn if any of the birds ringed by them (green or white Darvic rings) breed outside their study area.

During 2004 the Tay Ringing Group ringed a total of 1,141 birds of 38 species in Central Region. The most frequent species that were ringed were Blue Tit (498), Great Tit (338), Swallow (293) and Chaffinch (144). Species of conservation interest included Barn Owl (1 adult and 51 pulli), Spotted Flycatcher (1 adult), Bullfinch (6 adults) and Reed Bunting (6 adults).

Recoveries are listed in Voous order, as for the systematic list, under the following headings:

Ring Date seen in 2004 Location seen Location ringed Date ringed Observer
followed by the locations where the bird was seen in between.

GREYLAG GOOSE

**Green neck HLA 01 Feb Sheardale Nordur Mula, 20 Jul 1998 AET
ICELAND**

Nr. Fearn (Easter Ross) 21 Oct 1998; Scabster Brae (Caithness) 17 & 27 Nov 1998.

**Grey neck BZV 26 & 27 Feb Sheardale Masvatn, S-Ping, 15 Nov 1999 AET
27 Nov, 27 Dec East Alva ICELAND**

Ladybank (Fife) 16 Feb 1998; New Gilston (Fife) 2 Mar 1998; nr. Drumley 13 Feb 1999; Acharvole 4 Nov 1999; Clatto Res. (Fife) 21 Nov 1999; nr. Giffordtown (Fife) 6 Jan 2000; nr. Easter Kilwhiss 12 Jan 2000; nr. Kingskettle (Fife) 13 Jan 2000; Kilwhiss (Fife) 19 Jan 2000; Rossie Bog (Fife) 21 Jan 2000; by Easter Kilwhiss (Fife) 30 Jan 2000; Melville Muir (Fife) 6 Feb 2000; Kilwhiss (Fife) 19 Feb 2000; Giffordtown (Fife) 3, 9 & 10 Feb 2001; Easter Kilwhiss 23 Feb 2001; Giffordtown (Fife) 24 & 25 Feb 2001; nr. Logie Fm. (Fife) 7 Mar 2001; Caldcoats Fm. 17 Mar 2001; Easter Kilwhiss (Fife) 9 Dec 2001 & 6 Feb 2002; Rossie Bog (Fife) 24 Feb 2002; Luthrie 30 Mar 2002; Angle Park 2 Nov 2003.

**Grey neck HCA 27 Feb Sheardale Loch Eye (Easter Ross) 24 Feb 2000 AET
27 & 28 Nov East Alva
05 Dec West Tillicoultry
17, 18, 19, 24 & 30 Dec East Alva**

Kilgarie Fm, nr. Montrose (Angus) 14 Jan 2001; Leira, Reydarfjardarbaer, ICELAND 15 Apr 2001; Drymen (Stirlingshire) 10 Jan 2003; Sheardale (Clackmannanshire) 14, 17 & 18 Mar 2003.

**Grey neck NHZ 26 & 27 Feb Sheardale Loch Eye (Easter Ross) 15 Nov 1999 AET
Balnaha, nr. L. Eye (Easter Ross) 21 Oct 1999; Burnside Fm., nr. Elgin 29 Dec 1999;**

Ardivot, nr. Lossiemouth 30 Jan 2000; Pitgaveny, nr. Elgin 10 Feb 2000; East Calcots, nr. Elgin 14 Feb 2000; Lochslin, L. Eye 21 Oct 2000; Newton, Tore, Black Isle (Rossshire) 1 Nov 2000; Tain (Easter Ross) 21 Nov 2000; Arabella (Easter Ross) 25 Nov 2000; Munloch Bay, Black Isle (Rossshire) 9 Dec 2000; Kilcoy, Black Isle (Rossshire) 12 Dec 2000; Upper Ruthven, Dinnet 2 Nov 2001; Kennet Pans (Clackmannanshire) 21 Dec 2002; Sheardale (Clackmannanshire) 15, 16, 20, 24, 26 Jan 2002 & 18 Feb 2002; Mounteagle, L. Eye (Easter Ross) 19 Oct 2002; Balblair, nr. L. Eye (Easter Ross) 20 Oct 2002; Sheardale (Clackmannanshire) 14 & 17 Mar 2003.

Grey neck NTF 27 Feb Sheardale Loch Eye (Easter Ross) 16 Nov 1999 AET
Cuthill, Dornoch 3 Nov 1999; Udale Bay, Cromarty Firth 12 Nov 1999; Bindal Muir, Tarbat Ness (Easter Ross) 21 Nov 1999; Coulnagour, Inner Cromaty Firth 5 Dec 1999; Kinnedar, nr. Lossiemouth 23 & 30 Jan 2000; Fearn (Easter Ross) 20 Oct 2000; Lochslin, L. Eye (Easter Ross) 21 Oct 2000; N. Cadboll, nr. Balintore (Easter Ross) 23 Oct 2000; Dingwall Bay, Cromarty Firth 11 Nov 2000; Kilco, Black Isle (Rossshire) 12 Dec 2000; The Wards, Roseisle (Moray) 17 Dec 2000; Little Pilmuir (Fife) 10 Feb 2001; Logie Fm. (Fife) 7 & 10 Mar 2001; Hillhead, Forres (Moray) 20 & 21 Jan 2002; Wester Calcots, Elgin 28 Oct 2002; Woodside, Lhanbryde (Moray) 30 Oct 2002; Corrie Hill, Keig, Alford 13 Dec 2002; Brindy Hill, Keig, Alford 15 Dec 2002.

Orange neck BSB 19 Dec Carse of Lecropt, BoA Loch Eye 19 Dec 2004 RHD, NB
BFA 16 Oct Dunmore Nordur Mula, ICELAND 20 Jul 1997 RHD
Lochslin, L. Eye 11 Oct 1997; Loch Ken (Dumfriesshire) 10 Apr 1999; Clasnamuich, Balintore (Easter Ross) 5 Oct 1999; Loch Eye (Easter Ross) 7 Oct 1999; nr. Arabella (Easter Ross) 12 Oct 1999; Cullerlie, nr. Loch of Skene 24 Oct 1999; E. Millichen Farm, Glasgow 4 Oct 2001.

Red 3B1B 21 Dec Vale of Coustry High Bonnybridge 6 Oct 2002 NB
Re-sighted at Broadwood L. and Hogganfield L.

WHOOPE SWAN

Yellow neck 3J01 29 Jan L. Lubhair/L. Dochart ICELAND 10 Aug 1994 NB
At Glenshee 6 Nov 1995; R. Tay, Spittalfield Dec 1996; L. of Lintrathan Dec 1997 & Nov 1998; East Perthshire Nov 1998 to Jan 1999; Glenshee & L. Dochart Dec 1999.

MUTE SWAN

Green FPY 27 Mar Airthrey Loch St. Ninian's opencast site (Fife) 1 Sep 1991 AET
After a spell at Linlithgow L. Mar to Sep 2002, moved to Alexandra Park, Glasgow, by Oct 2002 and remained in that area with occasional moves to Drumpellier May 2003 and Broadwood L. Jun 2003, Nov 2003 & Jan 2004 before moving to Airthrey and then back to Linlithgow in May/June 2004.

Green HAS 20 Nov Gartmorn Dam Linlithgow L. (West Lothian) 29 Sep 2002 AET
Stayed at Linlithgow Loch until 22 Aug 2004.

Green HHC 13 Nov Gartmorn Dam Stenton Pd., Glenrothes (Fife) 27 Dec 2002 AET
Moved around Edinburgh flocks, then on to Linlithgow Loch by Nov 2003, remaining there till Aug 2004 and returned there again by Nov 2004.

Green HJL 27 Mar & 29 Dec Airthrey Loch Dundas Loch (Fife) 11 Aug 1996 AET
Originally green AZD. In Glasgow area until Aug 1998, then Loch Gelly May 1999 & Jul 2000; re-ringed HJL at Inverkeithing Harbour 29 Jun 2003; Kilconquhar Loch Jul-Sep 2003 & Jan 2004. At Airthrey Apr & Nov 1999, Jan & Dec 2000, Feb 2003 & Dec 2004.

Green HLY 27 & 29 Dec The Boll, Alva Blackford Pond, Edinburgh 24 Aug 2003 AET
Stayed in Edinburgh until Mar 2004, then moulted at Musselburgh. At Torry Bay Nov 2004.

Green HPI 22 Aug Gartmorn Dam North Esk Res., Carlops 30 Aug 2003 AET
27 & 29 Dec The Boll, Alva

Abandoned by parents and taken to SSPCA Middlebank on 27 Sep 2003. Released at Linlithgow Loch on 20 Dec 2002, where it remained until Aug 2004. At Torry Bay Nov 2003.

Green HXB 22 Aug Gartmorn Dam Newliston Pond, nr. Kirkliston 10 Jan 2004 AET
Abadoned by parents and taken into care at SSPCA Middlebank. Released at Linlithgow Loch on 10 Jan 2004 where present till Aug 2004 and back there again by Sep 2004.

Orange 3ASL 27 Mar Airthrey Balloch, Loch Lomond 13 Oct 2001 AET
Gartmorn Dam Oct 2002; Airthrey Loch Feb 2003, Mar 2003, Apr 2003, Mar 2004 & R. Devon at Cambus Aug 2004.

Orange 3BFS 15 May Gartmorn Dam Tannoch Loch, Milngavie 8 Aug 2002 AET
Hogganfield Loch Mar, Apr and Jun 2003.

Orange 3BJC 24 Dec 2002 Gartmorn Dam Gartmorn Dam 2 Nov 2002 AET
A regular at Gartmorn Dam where present 16 Jan 2003, 19 Jan 2003, 5 May 2003, 21 Sep 2003, 1 Nov 2003, 22 Nov 2003, 14 Dec 2003, 21 Dec 2003, 25 Dec 2003, 1 Feb 2004, 20 Feb 2004, 13 Mar 2004, 16 Mar 2004, 27 Mar 2004, May 2004, 18 Jul 2004 & 17 Oct 2004.

Orange 3CDF 16 Oct Gartmorn Dam Magiscroft Fishery, Cumbernauld 20 Aug 2004 AET
Gartmorn Dam 28 Nov & 25 Dec.

White FXT 14 Feb, 30 Oct & 12 Dec South Alloa Duddingston L., Edinburgh
26 Aug 1990 RHD, AET

Stayed mainly in the Edinburgh area, then in Fife in 1991, 1992 and 1993 before returning to the Edinburgh area by October 1993. Last seen St. Margaret's Loch, Edinburgh 9 Mar 1995.

White HFF 14 Feb, 30 Oct & 12 Dec South Alloa Town Loch, Dunfermline
28 Nov 1991 RD, AET

Caught at Dumbarton with damaged bill. Taken into care at SSPCA Middlebank 6 Nov 1991 and released at Town Loch 28 Nov 1991. Remained there till Aug 1993 when it went to Cramond, Edinburgh where it was present between Sep 1993 and Mar 1995. FXT and HFF were recorded together in Sep 1994 and have likely been a pair since. Believed to breed somewhere in the recording area. Further observations of these birds are sought by the ringers.

White 420 23 Oct Gartmorn Dam Hirsell Lake, Coldstream 23 Aug 2003 AET
At Inverleith Pond May 2004

COMMON GULL

512?784 10 Jan 2003 Gartmorn Dam Scandinavia AET

PIED FLYCATCHER

K950922 14 Jun 2003 Lendrick, Brig o' Turk Ross Wood, Loch Lomond
13 Jun 2001 TRG

This bird was ringed at Ross Wood and was found (long) dead 2 years and 1 day later at Lendrick, a distance of 20 km NE.

P310709 12 Jun 2003 Kenmore Wood, Tarbet Lendrick, Brig o' Turk
12 Jun 2001 TRG

Nested at Lendrick and was recaptured exactly 2 years later at Tarbet, a distance of 23 km W.

R058732 21 Jun 2004 Kenmore Wood, Tarbet Lendrick, Brig o' Turk
14 Jun 2003 TRG

Ringed at Lendrick and was recaptured 1 year and 7 days later at Kennmore, a distance of 23 km W.

BLUE TIT

R482200 29 Feb 2004 Kilmahog Callander 26 Feb 2004 TRG
 Ringed at Callander and found dead 3 days later at Kilmahog, a distance of 2 km W.

GREAT TIT

R060565 5 Oct 2003 Menstrie Saline 27 Jun 2003 TRG
 Bird ringed at Saline and recaptured 100 days later at Menstrie, a distance of 18 km WNW.

TA21069 1 Jun 2003 Garrison Fm., Loch Arklet Allt Beithe, Srathyre
11 May 2003 TRG

Bird ringed at Srathyre and recaptured 21 days later at Loch Arklet, a distance of 22 km, WSW.

SYSTEMATIC LIST

Codes - S, F and C indicate records from Stirling, Falkirk and Clackmannanshire "Districts".

*RED-THROATED DIVER *Gavia stellata* (b, w)

F One Kincardine Br. 21 Mar (MT), 3 Kinneil 25 Sep (DT, RHD), 1 W Blackness Castle 19 Dec (MA).

S Killin: Pr. nesting on hill loch. (PWS).

* BLACK-THROATED DIVER *Gavia arctica* (b, w)

S Trossachs: Pr. noted at 1st site 30 Mar with pr. at 2nd site failing to breed, M on 'sentry duty' for short period only (JM/SA DJC DOE). M L. Lubhair 8 Jul (DJC).

* GREAT NORTHERN DIVER *Gavia immer* (w)

S One on R. Forth between Stirling Br. & A91 on 27 Jan (MM).

LITTLE GREBE *Tachybaptus ruficollis* (B, w)

WeBS max: 52 inland in Jan & 68 in Oct, 87 % found on still waters.

F Site max: 8 Skinflats Pools 16 Feb & 5 on 29 Sep, 5 Little Denny Res., 4 Black Loch (incl. ad.-sized J.), 4 St Helen's Loch 15 Sep, 10 Kinneil 18 Dec & 7 R. Carron (M9 - M876) Dec (AB GO NB DT MA).

C Four Gartmorn Dam 16 Oct & 4 R. Devon (A907-Cambus Weir) 19 Nov (AET KW).

S Spring site max: 19 L. Lubnaig 16 Jan (new high & 2nd highest in recording area since 20 at Airthrey Loch 1974), 11 L. Voil /L. Doine 16 Jan, 7 L. Dochart /L. Lubhair 23 Feb (NB).

Breeding: Pr. calling David Marshall Lodge 8 Mar, prs. at Cambusmore / Gart GP, L. Watston & Upper Lanrick 20 Jun & ad. with 3 Y Cambusmore / Gart GP 30 Jul, ad. + 2 J Invertrossachs 24 Sep (NB DT DOE DAC).

Autumn site max: 13 Cambusmore/Gart GP 2 Oct, 12 L. Lubnaig 26 Oct, 13 L. Dochart /L. Lubhair 26 Oct, 8 Blairdrummond GP 31 Oct, 8 L. Voil 7 Dec & 4 R. Teith 28 Nov (MVB NB RD).

GREAT CRESTED GREBE *Podiceps cristatus* (b,W)

WeBS max: 44 Forth Est. in Oct 33 inland in Sep.

F Blackness: 40 on 31 Jul, 25 on 26 Sep & 31 Oct (RS MA). Kinneil: 9 on 29 Feb, max 28 on 1 Jul with 11 on 13 Dec (DT MVB). 7 incl. 2 large juv. Black Loch, Limerigg 15 Sep. 1 Little Denny Res. 15 Dec (NB).

C Gartmorn Dam: 8 on 22 Feb, 16 on 27 Jun, (1 on & 2 near nest, 1 chick). 12 on 22 Aug with broods of 3, 2 & 1. (imms. of which 2 were flying strongly). 12 on 26 Sep incl. 7 imms. with 13 on 16 Oct incl. 2 imms (AET).

S Lake of Menteith: 11 on 17 Feb & 3 Mar, 8 on 2 Apr & 11 on 24 Sep incl large J being fed, min 5 on 29 Nov. 6 Carron Valley Res. 21 Mar, singles N Third Res 28 Feb, L. Venachar 18 Oct, L. Coulter 23 Oct. 4 at Forth/Teith conf. 11 Dec (NB DT

DAC BO SA).

Breeding: Cambusmore /Gart GPs: Pr. in breeding plumage performing courtship display 16 Feb. Pairs with broods of 2 & 3, 3rd pr. with bird on 6 Jul, 5 ads. & 4 juvs. 30 Jul, ad. & juv. 13 Sep. Pr. Blairdrummond GPs 16 Apr. Pr. L. Ruskly 7 May, juv. Blairdrummond 31 Oct (NB DT PWS DOE).

*SLAVONIAN GREBE *Podiceps auritus*

S One L. Drunkie 27 Oct (KF).

* FULMAR *Fulmarus glacialis* (p)

F One W Blackness 31 Oct Kinneil: single birds 15 Jun & 4 Sep, 11 on 28 Nov (AB DT).

*MANX SHEARWATER *Puffinus puffinus*

F One Kinneil Bay 17 Sep (AS).

GANNET *Morus bassanus* (p)

F Substantial passage began with 2 juv. > E Camelon 13 Sep. Main movements 24 - 26 Sep with 217 Kinneil, mostly juvs./imm. F; most returned seawards on stiff W. breeze 25 Sep. 12 juv. > W Blackness 26 Sep. 17 J > W. S. Alloa 3 Oct (MA DT AB RHD).

S One Argaty 23 Sep with 2 grounded juv. recovered by SSPCA there 28 Sep (later released with 11 others at the coast). 11 E over Argaty 28 Sep, 1 juv. SW E. Dunblane, 41 juv. W Fallin & juv. Lecropt 26 Sep. Juv. grounded L. Ard recovered by SSPCA 28 Sep. Juv. W Fallin 16 Oct (DOE LB MVB RHD DT).

CORMORANT *Phalacrocorax carbo* (S, W)

WeBS peaks: 266 Forth Est. Oct, 84 inland Feb & 95 Dec.

F Max 35 Skinflats Sep. Bird perched on low pylon by R. Carron at Dorrator was taken from behind by Buzzard which carried it to waste ground to eat. (MVB MA).

C 205 S. Alloa roost 14 Nov, max 9 Gartmorn Dam roost 19 Dec, 15 R. Forth Cambus - S. Alloa 14 Nov (AET).

S Site max: 31 Lake of Menteith 31 Oct, 20 L. Laggan roost, L. Lubnaig 17 Oct, 14 Carron Valley Res. 14 Feb, 5 Kippen Muir Dam 17 Nov, 7 N. Third Res. 7 Nov, 5 L. Voil 22 Sep, 5 L. Ruskly 24 Jan. (NB DJC DC BO).

*LITTLE EGRET *Egretta garzetta*

F One Blackness 15 Jun (RS).

C 2003: Ad. in breeding plumage Cambus Village Pools 18 May. 1st record for Clackmannanshire (NB).

GREY HERON *Ardea cinerea* (B,W)

WeBS peaks: 17 Forth Est. Jan & 77 Nov, 90 inland Jan & 85 Dec.

F At least 15 nests (27 eggshells) Dunmore Woods 4 Apr (AB). Max 27 Skinflats 2 Dec, 25 Dunmore 13 Oct (MVB) 13 South Alloa 16 Oct (AET).

C Max. 14 R. Devon, Dollar-Tillicoultry 18 Mar. 30 Poppletrees/Alloa Inch 4 Nov, 8 Tillicoultry Pond 7 Nov, 9 Alloa Inches 12 Dec (DE AET).

S Six Killin Marshes 10 Jan, 13 Lecropt (11 on meat plant roof) 25 Jan, 8 Lake of Menteith 3 Mar, 17 Nyadd Farm 15 Apr, 10 Cambusmore/Gart GPs 2 Oct (NB DT MW MVB).

MUTE SWAN *Cygnus olor* (B,W)

WeBS peaks: 178 inland in Feb with 219 in Nov, 31 % on linear waters.

F Pr. + 4 juvs. Callendar Park Loch 17 Sep, 21 Forth/Clyde canal, M9-Bonnybridge Nov, 31 (7 juvs.) Little Denny Res 23 Nov (DM AA NB).

C 17 (2 juvs.) R. Devon, Alva-Tillicoultry 26 Feb, 17 E of Kersiepow 16 Mar. Gartmorn max 18 (6 imm) 27 Mar & 32 (7 imm) 26 Oct. 3 nests Gartmorn 15 May with broods of 4 & 5 on 17 Jun & 4 & 3 on 22 Aug. Pr. + 5 cygnets Cambus Village Pool 17 Jun, 4 ads.+ 7J R. Devon Tullibody Br.- A 907 17 Sep (GEL AET)

CJH KW).

- S Site max: Airthrey Loch 28 on 8 Jan & 20 (2J) 17 Oct, no breeding there. 36 L. Watston 25 Jan & 25 on 18 Dec, 24 Lake of Menteith 17 Mar & 23 (4J) 18 Dec. 36 Blairdrummond GP 25 Dec. (MVB MK DK DOE NB).
Breeding: Nest Cocksburn Res 27 Mar (2ads. + 3J) 20 Sep, pr. Invertrossachs 17 Apr, pr. on shore of L. Tay, Killin 17 Apr (3Y 7 Jun, 2Y 9 Jul), pr. & 9Y Gart 19 Jun (8 large juvs 13 Sep, several died during the winter), pr.+4juvs. L. Daira, Blairdrummond pr. & brood 6 Jun, 1⁺ pr. bred Lecropt 12 Jul, pr.+7juvs. L. Watston 29 Aug. (AET ES DOE PWS NB DT).

WHOOPER SWAN *Cygnus cygnus* (W)

- WeBS peaks: 46 inland Jan & 65 in Nov. 22 % were juvs. during Jan-Mar (N=110) with 19 % juvs. during Oct-Dec (N=203)
- F 11 St Helen's Loch 21 Jan, 22 Airth Station Rd. & Hill of Kinnaird 11 & 14 Nov, 40 Skinflats 3 Nov, 43 Dougalshill, Airth 4 Dec. (NB AB MVB AMf RHD).
- C 12 Orchard Fm. 25 Feb, 3 > over Cambus Pools 7 Apr, 15 Tullibody Inch 14 Nov, 10 at roost there 12 Dec (NB AET).
- S Site max. 22 L. Dochart/L. Lubhair 11 Mar & 12 on 20 Nov, 13 L. Voil 20 Feb, 2 birds over-summered on the R. Forth around Craigforth, 24 E. Gogar 22 Oct, 25 Offers, Kirk Lane 1 Nov, 9 Carron Valley Res. 17 Nov, 19 Hill of Drip 28 Nov, 21 R.Teith /R. Forth conf.-W. Row 28 Nov, 14 Shaw of Touch 29 Nov, 10 R. Forth, (Allan Water-R.Teith conf.) 19 Dec, 15 R. Forth W Carse Fm.-Teith conf. 19 Dec (DOE RBA JT NB KW CJM DAC RHD DT RC).

*BEAN GOOSE *Anser fabalis* (W)

- F Max count 262 Slamannan plateau 13 Nov (BGSg). Numbers continue to rise annually.

PINK-FOOTED GOOSE *Anser brachyrhynchus* (W)

Autumn national goose counts (JC RB LM AET):

	Oct	Nov	Dec
Skinflats	2530	0	NC
Loch Mahaick	1200	NC	NC
Lake of Menteith	5357	2860	478
Alloa Inches	0	0	0
Gartmorn Dam	0	0	0

- F 1650 Skinflats 18 Jan, 302 Slamannan 21 Jan, 1750 NW of Airth 8 Feb & 1500 Manor Loan 20 Feb, white phase ad. Manor Loan 21 Feb. 6 Blackness Bay 29 Aug were first of autumn, 3070 Kennetpans 13 Oct, 3000 Stonehouse Fm 27 Oct, 500>S Kinneil 30 Oct, 530 Skinflats 2 Dec. (MVB NB DT AB).
- C 260 & 376 W of Cambus Pools 25 Jan & 7 Apr, 753 Haugh of Blackgrange 18 Dec (CJH AET RHD).
- S 1200 N. of Buchlyvie 26 Jan, 2100 Throsk 22 Feb, 500 Kinbuck 13 Mar, 500 Meiklewood 21 Mar, 5000 Br. of Frew 6 Apr, 290>NW BoA & 100s N Dunblane 16 Apr (last departure). 1 Dochart Haughs 22 Sep was unusual date. 1400 NE of Buchlyvie 3 Oct, 800 Offers, Kirk Lane 4 Nov, 1516 Carse of Lecropt 21 Dec. (DAC MVB DOE JW DT CJH DW NB CJM).

GREYLAG GOOSE *Anser anser* (b, W)

- F 59 at Black Loch, Limerigg were standing on ice 1 Mar, 71 Skinflats Pools 21 Mar with 3 here 23 May, 300 Blackness Bay 29 Aug presumed feral birds, 45 there 7 Sep, 11 Kinneil 24 Sep, white morph paired with normal bird St Helen's Loch 23 Oct. (NB MVB AB IMf LP DT).
- C Autumn national goose counts (AET)

	Oct	Nov	Dec
Gartmorn Dam	0	118	508
Tullibody Inch	0	526	633

208 Coalsnaughton 24 Jan, 658 R. Devon Tullibody Br. - A 907 29 Jan, c.247 Sheardale 31 Jan with 430⁺ there 27 Feb, 350 R. Devon, Alva 22 Feb with 400 there 22 Mar, 917 Orchard Fm. 25 Feb, 741 S of Alva 19 Nov with 332 there 27 Nov & 318 30 Dec, 360 W of Tillicoultry 5 Dec, 408 E of Alva Ind Estate 17 Dec, 267 SE of Sheriffyards, 399 Gartmorn Dam & 219 Haugh of Blackgrange 19 Dec. Pair of feral birds at Gartmorn Dam all year with max. of 19 in Cambus area Aug. (AET KW JT GEL NB RHD).

- S Max. 600 R. Forth (W Carse Fm.-R. Teith conf.) 29 Feb, 158 Killin 23 Feb, 234 L. Coulter 1 Mar, c.400 put up by shooting E Cambusdrennie 3 Mar, 98 L. Coulter 15 Sep with 255 on 23 Oct (feral birds?), 731 Shaw of Touch 29 Nov, 107 Killin 11 Dec (RC NB).

CANADA GOOSE *Branta canadensis* (b W)

WeBS peaks: 219 inland in Feb & 408 in Nov.

- F 99 St Helen's Loch, Bonnybridge 11 Jan & 153 on 15 Dec, 25 Skinflats 3 Sep (NB RS).

- C Four W of Cambus Pools 7 Apr, 61 Rhind to Tullibody Inch 16 Oct (AET).

- S Site max: 6 Monachylemhor 16 Jan were furthest W up this glen, 130 L. Venachar 16 Jan & 111 on 20 Nov, 28 Vale of Coustry 26 Feb, 33 L. Ard 30 Mar, 190 Gart 30 Jul incl. a few hybrids, 1 all whitish, c.150 Lecropt 12 Sep, 294 L. Coulter 15 Sep was highest ever count for recording area. 35 L. Rusky 24 Sep, 75 Doune 17 Oct, 87 Lake of Menteith 31 Oct, 100 Offers, Kirk Lane 4 Nov, 30 Dochart Haughs 26 Nov, 53 L. Katrine 20 Nov, 32 Pier Rd., Killin 11 Dec (NB KF DT DOE JM SA).

Breeding: 7 L. Lubnaig 31 Jul incl. 4 juvs., 2 prs. Upper Lanrick Dam each had brood of 3. 1 L. Voil 13 May, (JT DOE DJC).

*BARNACLE GOOSE *Branta leucopsis* (w)

- F 40 Skinflats 4 -7 Oct, 4 Dunmore 16 Oct (AMf GO HRD).

- C One over Cambus Pools 23 May, 3 S of Alva 17-20 Nov, 1 Haugh of Blackgrange 4 Dec, 3 there 8 & 25 Dec (AET BNS HRD).

- S One Br. of Frew 6 Apr, also hybrid there with plumage indicating Barnacle x dark morph Snow Goose parentage, 1 Lecropt 19 Dec (DT).

*BRENT GOOSE *Branta bernicla* (w)

One Kincardine Br. 14 Nov & 12 Dec (MVB MT).

SHELDUCK *Tadorna tadorna* (b, W)

WeBS peaks: 510 Forth Est. in Mar & 1247 in Sep.

- F 120 Skinflats (low winter numbers again) 18 Jan, 558 on 18 Sep down to 135 on 2 Dec, pr. with brood of 8 first seen Kinneil 26 May, moult flock at Kinneil totalled 2860 on 21 Jul down to 366 on 13 Dec, 43 Blackness 1 Sep (DT MVB DB).

- C 40 Kennetpans 22 Feb, max 60 S of Cambus Village 4 Feb, autumn max 60 Tullibody Inch 14 Nov (CJH NB AET).

- S Inland: 1 L. Katrine 30 Mar, 1 R. Forth, Craigforth 25 May (SA DT).

WIGEON *Anas penelope* (b, W)

WeBS peaks: 337 Forth Est. in Feb & 1074 in Dec. Inland: 687 in Jan & 359 in Dec (MVB NB).

- F Site max: 240 Blackness 31 Oct, 200 Kinneil 10 Mar, 147 on 13 Dec, 62 Skinflats 22 Feb with 200 on 26 Oct (AB CJH MVB AMf).

- C Ca. 180 Kersiepow Pond 12 Jan, 308 Alloa Inch 12 Dec, max 120 Gartmorn Dam 23 Oct (NB AET).

- S Site max: 232 Cambusmore / Gart GP 16 Feb, only 1 left 20 May, 184 on 7 Dec, 130 L. Dochart / L. Lubhair 23 Feb, 60 Craigforth 10 Mar, 79 Pier Rd., Killin 11 Dec, 126 R. Forth (W Carse Fm.-Teith conf.) 19 Dec (NB, PWS DT RC).

Breeding: c/ 7 hatched Mid Torrie Fm. Jun (BB).

*GADWALL *Anas strepera* (s, w)

- F M Skinflats Pools 5 Apr, pr 23 Apr, 2 M 4 May & 7 on 13 Aug. (DT AB GO).
 C Pr. Cambus Pools area 18 Apr - 23 May, Pr + M on 2 Jun, Pr Devonmouth Pool 17 Apr, M 26 Apr & Pr 6 May, 3 (2M) Cambus Village Pool 20 Apr with prs. there on 3 dates between 22 Apr - 3 May. All these records probably refer to the same birds. 2M Gartmorn Dam 19 Dec, M there 25 Dec (AET CJH NB).

TEAL *Anas crecca* (b, W)

- WeBS peaks: 1751 Forth Est. Jan & 997 Dec. 1478 inland Feb & 1058 Nov (equally divided between still & linear water sites) (MVB NB).
 F 610 Kinneil 2 Jan, 265 on 25 Mar, 295 on 11 Sep & 361 on 13 Dec, 250 Skinflats 18 Jan, only 5 on 18 Sep rising to 210 2 Dec (MVB DT). 130 R. Carron (A905 - Carronbridge) Feb & 161 Dec. (IH AB).
 C R. Devon: 139 Dollar - Tillicoultry 19 Feb, 128 Tillicoultry - Alva 7 Nov, 279 Kersiepow Pond 4 Feb, 76+ Tillicoultry Pond 7 Nov, R. Forth: 106 Cambus - Alloa 16 Oct, 264 Kennetpans 18 Jan & 186 on 24 Oct, 211 Tullibody Inch 14 Nov & 248 Alloa Inches 12 Dec, 64 Cambus Village/ Devonmouth Pools 10 Sep (DE E&GL NB AET CJH).
 S 96 Cambusmore/Gart GP 24 Jan, 55 L. Coulter 11 Feb, 92 L. Laggan 14 Feb, ca. 100 L. Dochart 11 Mar & 80 on 20 Nov, 58 Killin Marshes 22 Sep, 63 L. Mahaick 17 Oct, 64 Hillend Pond 29 Nov, 104 Lake of Menteith 29 Nov, 213 R. Forth (Stirling Br. - Fallin) 22 Feb & 165 on 12 Dec, 110 R. Teith (W. Row-R. Forth conf.) 28 Nov (NB DAC JT DOE MMc DJ RD).
 Breeding: Prs. noted from several sites in C & S but no confirmation of breeding.

GREEN-WINGED TEAL *Anas carolinensis*

- S 2001: Male R. Forth, Stirling 11 Nov (AET).

MALLARD *Anas platyrhynchos* (B,W)

- WeBS peaks: 305 Forth Est. Jan & 331 Nov. 1855 inland Jan with 1638 in Dec. (70 % found on still water sites). 30 % are duck pond birds relying on food from humans (MVB NB).
 F Broods of 7 & 6 small ducklings Skinflats Pools 9 Jun & 19 Jul (AB).
 C F with 3 ducklings Gartmorn Dam 27 Jun, 254 there 19 Dec. F&7 ducklings Blackdevonmouth 27 May, 3 broods Cambus Pools 2 Jun. (AET CJH).
 S 218 R. Forth (W. Carse Fm.-R. Teith conf.) 20 Oct, 102 L. Voil 26 Oct (feeding on acorns), 278 Airthrey Loch 12 Dec. (RC NB MK).
 Breeding: Broods of 7 & 3 Airthrey Loch 27 Mar, F with brood Killin 4 Jun (AET PWS).

PINTAIL *Anas acuta* (W)

Kinneil/Skinflats area summary

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
37	22	8	2	0	0	0	1	14	58	64	52

- F Kinneil max: 47 on 30 Oct Skinflats max: 37 on 9 Jan & 52 on 2 Dec. First return to Skinflats F/imm. 3 Sep, 1 Blackness 1 Nov, F Drumbowie Res. 15 Dec, 80 flying into stubbles at Powfoulis 29 Dec. (GO DAC MVB DT D&AC Amf).
 C M Gartmorn Dam 25 Dec (AET).

*GARGANEY *Anas querquedula*

- C M Cambus Pools 13 May (CJH) (3rd record for Clackmannanshire)

SHOVELER *Anas clypeata* (p)

- F Kinneil: max 4 on 14 Mar, pr 4 Apr, 2 on 12 Aug, max 4 on 25th Sep, 5 on 30 Oct & max 6 on 11 Nov. 2 F Skinflats 7 Feb, M Little Denny Res. 1 Mar & 23 Nov (AET DT CJH NB MVB GO DAC).

- C M Cambus Pools 23 May, 2 eclipse there 28 Aug, M >SW along R. Forth at Alloa 3 May, M, Blackdevon Wetlands 27 May, M Devonmouth Pool 10 Sep (AET NB CJH).
- POCHARD *Aythya ferina* (W)
 WeBS peaks: 119 inland in Jan & 73 in Nov, no records from linear sites.
- F Very scarce, records of single birds from only three sites (NB).
- C 12 Gartmorn Dam 22 Feb, 19 on 13 Nov. Over-summering M (AET).
- S Site max: 34 Carron Valley Res. 24 Jan, 11 L. Katrine 26 Jan, 19 L. Lubnaig 22 Feb, 14 Blairdrummond 26 Feb, 22 L. Venachar 20 Nov & 12 Lake of Menteith 29 Nov (A&DC JM NB SA). Over-summering birds at Flanders Moss Lochan 20 Jul & Cambusmore/Gart GP 30 Jul (DP DT).
- TUFTED DUCK *Aythya fuligula* (B, W)
 WeBS peaks: 319 Jan inland & 478 Dec. Only 1 bird on a linear site.
 Records of birds at several sites during summer months but no confirmed breeding.
- F 24 Kinneil Pond 4 Feb, 2 Kinneil 29 Feb, 23 Little Denny Res. 1 Mar, 3 imm. M Skinflats 26 Jul, 20 Black Loch, Limerigg 26 Sep (AS DT NB GO).
- C 133 Gartmorn Dam 27 Mar, 213 on 22 Aug & 159 on 13 Nov (AET).
- S Site max: 201 Lake of Menteith 18 Dec, 38 Blairdrummond 26 Feb, 23 Airthrey Loch 11 Jan (historically low numbers), 24 Waltersmuir Res. 27 Mar, 65 Cambusmore/Gart GPs 17 Oct (NB MVB MK AL).
- SCAUP *Aythya marina* (s, w)
 F Kinneil Jun-Oct, max 9 on 15 Sep, imm./F Skinflats Pools 11 Oct with 5 on 16 Oct (DT RS GO MVB)
- S Two imms./F Blairdrummond GP 26 Jan still there 26 Feb. F in winter plumage Lake of Menteith 17 Feb, 8 Mar & 18 Dec (NB).
- *LESSER SCAUP *Aythya affinis*
 S M Gart Loch 19 Jun was a first for the recording area (AL).
- EIDER *Somateria mollissima* (w)
 F Four West Grangemouth 22 Feb with 12 on 21 Mar. Kinneil Feb-May, 1st 29 Feb & 8 (7M) last on 26 May, 3F 31 Aug & 10 prs. 18 Dec, 11 (6M) E of Blackness Castle 17 Apr with 4M Blackness Bay 19 Dec, 5 (3M) Skinflats 11 Oct (MVB DT MA GO).
- *LONG-TAILED DUCK *Clangula hyemalis*
 F One Skinflats Pools 16 Oct - 19 Nov (MVB).
- S F Lake of Menteith 31 Oct, 29 Nov & 18 Dec (NB).
- GOLDENEYE *Bucephala clangula* (W)
 WeBS peaks: only 24 Forth Est. Feb & 82 in Dec, 608 inland Feb & 499 Dec. 86 % on still water sites. Sex ratio counts from distinct still sites Jan-Mar showed only 20 % M, whereas R. Devon (Tullibody Br.- Cambus Weir) showed 60 % M.
- F 20 R. Carron (Larbert- Carron Br.) 25 Jan, max 47 Black Loch 1 Mar, 27 Little Denny Res. 1 Mar, max 25 Skinflats Pools 16 Feb, 2F there 16 Jul & imm/F there 24 Jul (MA NB AB GO).
- C Max 37 (13M) R. Devon (Tullibody Br.-Cambus Weir) 29 Jan, max 93 Gartmorn Dam 27 Mar, 50 Alloa Inches 12 Dec (KW AET).
- S 184 on Lake of Menteith 8 Mar & 248 there on 18 Dec (only 29M), 49 L. Dochart/L. Lubhair 23 Feb & 47 on 26 Nov, max. 28 L. Katrine 17 Feb, 22 L. Lubnaig 20 Feb, 23 R. Forth (A91-A9) 14 Nov (NB JM SA MM).
- SMEW *Mergus albellus* (w)
 S Redhead L. Katrine 17 Feb, L. Arklet 15 Mar, still there 28 Mar (JM SA DJC).
- RED-BREASTED MERGANSER *Mergus serrator* (B, W)
 WeBS peak: 56 Forth Est. in Mar & 80 in Dec.

- F Max 30+ Kinneil 25 Sep, max Skinflats 25 on 21 Mar & 33 on 2 Dec, 3 Forth/Clyde canal (Lock 16-M9) 2 Feb, 4 (1M) Forth/Clyde canal (Lock 16-Bonnybridge) 22 Feb, max 5 R. Carron (Carron Br.-A905) 26 Jan & 20 Mar, 21 R. Forth, Airth 14 Nov (DT MVB DMM AA IH AB DM).
- C Pr. Tullibody Pond 12 Jan & 6 (4M) 4 Feb (as in 2002, unusual dates & location), 2 R. Devon (Alva-Tillicoultry) 26 Feb (NB GEL).
- S Two M Craigforth 20 Feb & 3M there 10 Mar, M Kinbuck 29 Feb, 2 Killin 28 Apr, 8 L. Ard 12 Jul, prs. on Hillhead Pond, Thornhill & Blairdrummond GP 25 Nov & 25 Dec (DT MVB PWS DC CJH DK).
- GOOSANDER *Mergus merganser* (B, W)
WeBS peaks: 23 Forth Est. in Nov, 103 inland Jan & 92 Dec. 63 % found on linear water features inland. Sex ratio counts from distinct sites in Jan-Mar showed 28 % M.
- F Five St Helen's Loch & 6 Little Denny Res 21 Jan, 11 L. Ellrig 15 Feb, F & 5 flightless juvs. Grangemouth 1 Jul, F & 7 juvs. R. Carron at Carronworks 30 Aug (NB JN AMf MA).
- C 13 (1M) Gartmorn Dam 11 Jan, 8 R. Forth at Cambus 3 Aug, 18 R. Devon (Dollar-Tillicoultry) 23 Sep, max 9 R. Devon at Cambus 16 Oct, 15 R. Forth at Tullibody Inch 14 Nov (AET DE).
- S 13 Airthrey Loch 8 Jan & 16 (11M) there 15 Dec. 8 W L of Daldorn 25 Jan, 14 R. Forth (W. Carse Fm-Teith conf.) 24 Mar, prs. noted Cambusmore GP, Killin Apr, 11 (5M) Craigforth 16 Apr, family party of 6 Lecropt 12 Jul, 12 Allan Water (Dunblane-Ashfield) 7 Oct, 12 Doune Ponds 8 Oct, max 7 Carron Valley Res 18 Oct, 6 L. Doine 26 Oct, 26 R. Forth (A91-W. Carse Fm) Nov WeBS, 11 R. Teith (Forth conf.-W Row) 28 Nov, 16 (4M) Lake of Menteith 18 Dec (MVB BB RC PWS DT AW DAC NB RD).
- *RUDDY DUCK *Oxyura jamaicensis* (p)
F M curling pond, Kinneil Wood 20 Aug (AS).
- RED KITE *Milvus milvu* (b ,W)
C One Ben Buck 27 Aug (JG).
- S 45 Braes of Doune roost 17 Jan with max 47 there 24 Dec. Roost includes birds from N Scotland, Dumfries & Galloway & N. Yorkshire release schemes. 16 prs. bred, 4 failed at incubation (wet weather), 19 juvs. fledged, Also imm pr. & 1 ad. AOT, 1 fledged juv. found poisoned & 1 starving juv. taken into care. (DOE DC).
- *MARSH HARRIER *Circus aeruginosus*
F Imm./F > off W from Skinflats 7 May (GO).
- *HEN HARRIER *Circus cyaneus* (b, w)
10 males & 5 ringtails noted in 2004. 2 widely separated locations checked by the Upper Forth Raptor Study Group: (a) unoccupied, (b) 2 prs fledged 3Y & 2 Y (PSA).
- S M Lecropt 3 & 17 Jan, 1 > to roost on Flanders Moss 28 Jan, ringtail Braes of Doune 17 Mar with M there 7 Nov (mobbed by Carrion Crow & Kestrel), ringtail at Kilbryde & Argaty 26 Sep & 17 Oct, 3 (2M) Flanders Moss 2 Oct with Ms there 1 Nov & 15 Dec, ringtail Carron Valley Res. 18 Oct with M there 12 Dec, M Kippen 5 Nov, M L. Watston 18 Dec (MVB DT DJC NB DOE DAC).
- *GOSHAWK *Accipiter gentilis* (b,w)
C One Dollar area 21 Apr (JG).
- S Juv. M flew inside Strathyre garden aviary hut after finches 15 Aug with another juv. M in same garden 27 Dec. (DJC).
- SPARROWHAWK *Accipiter nisus* (B, W)
Many records throughout the area, mainly Jan-May & Aug-Dec. WeBS counts recorded 24 (annual range since 1997: 19-34).

- F F caught House Sparrow & Robin in Champany garden Jan, ad. + 2 juvs. at Rough Castle & Drum Wood 1 Aug, ad. + 4 fledged Y Skinflats 14 Aug (IMf MA AB).
- C Imm flew into workshop in Castlebridge Business Park, resisted attempts to be caught by falconers & flew off the next morning (AET).
- S On freshly killed Woodcock, Gargunock 21 Jan, displaying over Ochiltree, Dunblane, seen off by 2 mobbing Carrion Crows, 24 Jan, 4 prs. in the Doune area, late brood of 2 fledglings in Newton Crescent Wood, Dunblane 14 Aug (IMf NB DOE MVB).
- BUZZARD** *Buteo buteo* (B,W)
 Now widespread & numerous throughout the area. Most common raptor on WeBS counts, 3 times the number of Kestrels. Numbers recorded on BBS were slightly above the 7 year mean and similar to the past 2 years.
- F Widespread in the district throughout the year, 7 Kinneil 28 Aug, 6 Bothkennar/Skinflats 7 Sep (AS DT AB).
- C 12 R. Devon (Dollar - Alva) in Mar (DE E&GL).
- S Braes of Doune-Thornhill: 36 prs., 27 known to have eggs with 23 prs. fledging 56Y (2.1Y per pr. with eggs, better than average). 6, incl. displaying pr., Dochart Haughs 23 Feb, 6 R. Teith, Lacropt 31 Oct, bird perched on Causewayhead roundabout had almost pure white underparts (DOE DA NB RD CJH).
 2003: 6 at roost with Ravens Braes of Doune, Lodge 7 Nov (DOE).
- GOLDEN EAGLE** *Aquila chrysaetos* (b, w)
 S Breeding : 6 home ranges checked by Upper Forth Raptor Study Group, all had prs. of which 3 reared 1Y each (PSA).
- OSPREY** *Pandion haliaetus* (B)
 First of year at Lake of Menteith 2 Apr, last Flanders Moss 2 Sep (DT DP)
 S Breeding: 11 sites, 10 with eggs of which 9 fledged 18 Y, 2Y in nest that blew out were replaced in an artificial nest & fledged; no eggs were laid in a new nest sited on a mobile phone mast, 2 birds seen off by a Kestrel on the Carse of Lacropt 5 Jun (DOE DT).
- KESTREL** *Falco tinnunculus* (B,W)
 Recorded at the highest density on BBS to date, twice the 7 year mean. Twice as frequent on mountain & moorland as farmland. The 2nd most common raptor on WeBS counts, 87 recorded.
- F Widespread in this district throughout the year, pr. bred Skinflats, ad. + 3 newly fledged juvs. on 19 Jul, 4 imms. there 30 Aug, brood fledged (1 killed on road) Champany, Blackness Jul, (AS AB GO AMf).
- C F hovered briefly low over Stoat carrying young into grassy verge at Alloa amenity site 13 May (NB).
- S Three prs. included brood of 2 at Argaty, Braes of Doune, 1 road kill Plean (by M9) 3 Nov (DOE AMf).
- MERLIN** *Falco columbarius* (b?,w)
 Pr. at 1 location, no evidence of successful breeding (PSA).
- F One Stonehouse Fm 3 Jan, M Skinflats 18 Jan, single, unsexed birds seen at Higgins Neuk, Champany Blackness, Powfoulis & hunting over stubble at Drum Fm., Bo'ness Oct-Dec (AS MVB AMf)
- S One Drip Moss 3 Jan, F Dalbrack 7 Mar, F chasing Meadow Pipit L. Katrine 1 Sep, 1 Flanders Moss 19 Oct, Throsk 25 Nov & Stonehill Fm., Dunblane 7 Dec (NB DOE DJC DP RS MVB).
- PEREGRINE** *Falco peregrinus* (B, W)
 Upper Forth Raptor Study Group checked 22 home ranges: 16 prs., 6 unoccupied. 10 successful prs. reared 23 Y (PSA).

- F One hunting along tideline at Powfoulis 5 Jan, 1 Grangemouth 25 Feb, 2 Airth on pylon 27 Sep, 1 S. Alloa 3 Oct & 1 stooped at tideline waders Skinflats 23 Dec (AMF AS H&RD).
- S Single birds at L. Watston 25 Jan, Stirling 31 Jan, Lanrick 29 Mar, Gualann 6 Jul, Garrique 18 Jul & R. Teith (Forth conf.-Blairdrummond) 31 Oct & 25 Dec (DK DOE AS JG RD).
- RED GROUSE *Lagopus lagopus* (B, W)
Generally under-recorded, no records from NW of area. Numbers on BBS were the lowest to date at only 30 % of the mean with a bird encountered every five linear km in the mountain and moorland habitat category.
- S 15+ Earlsburn Res. 4 Apr, 2 M Cringate Moor 5 May (DT GO).
- BLACK GROUSE *Tetrao tetrix* (B, W)
S Four M & 1F Inversnaid 31 Mar, M Cringate Moor 5 May, 8M L. Arklet 10 Nov (DJC GO).
- GREY PARTRIDGE *Perdix perdix* (B, W)
Recorded at very low frequency on BBS with a bird every 25 linear km on farmland.
- F Covey of 12 Higgins Neuk 5 Jan with max 13 on 12 Dec, 9 Skinflats 22 Jan, pr. there 31 May with 12 on saltmarsh 19 Dec, 8 Kinneil 8 Feb, 6 Upper Kinneil 2 Nov, 16 Brackenlees Fm. 14 Nov largest covey, 4 Airth 28 Dec (AMf AB MA DT AS MVB RHD).
- C Pr. Park Fm., Clackmannan 7 May, 8 juvs. Kersiepow 1 Oct, pr. Woodland Park, Alva 1 May (NB RHD).
- S Pr Ardeonaig 26 Apr & pr. in stubble field Cultenhove 15 Sep (PWS NB).
- *QUAIL *Coturnix coturnix*
F Two+ calling Champany 4 Jul & later in the month (IMf).
- S M Cardross, Flanders Moss 10 Jul with bird found dead in L. Ard Forest in Jul (DOE DA).
- PHEASANT *Phasianus colchicus* (B, W)
Very large numbers released on shooting estates, otherwise widespread but in small numbers. On BBS, slightly above the 7-year mean at a bird every linear km on farmland & half that frequency in conifer woodland & conifer/moorland edge.
- S Four F constant visitors to Stirling suburban garden some distance from the countryside Jan/Feb, 195 in fields (releases) Mid Lecropt 6 Nov (CJM MVB).
- *WATER RAIL *Rallus aquaticus* (b, w)
F Kinneil: 1 on 28 Jun, 3 incl 1 juv. on 7 Jul, 1 on 30 Oct & 2 on 18 Dec, single birds Skinflats Pools 5 & 23 Apr, 20 Aug & 1 Oct, 1 West Mains Pond 21 Feb, 1 wading with Moorhen in old mill lade at Carronworks 14 Sep (RS DT MA GO).
- C Juv. Cambus Pools 4 Aug (AET).
- S One Flanders Moss Pool 2 Sep (DP).
- MOORHEN *Gallinula chloropus* (B,W)
WeBS max: 127 inland Feb & 146 in Dec. 35 % recorded on linear water features.
- F Numbers on the Union Canal were only 14 % of the 1997-2000 mean, having fallen each year since restoration work commenced. Numbers on the Forth/Clyde Canal dipped by a max of 40 % of the 1996-99 mean during restoration work but were back to within 4 % this year (NB). Site max: 15 Forth/Clyde Canal (Lock16-E end) 19 Nov. 18 Callendar Park 3 Feb, 6 West Mains Pond 6 Nov (DMM MA).
- C Site max: 13 Inglewood Pond 12 Jan, 5 Cambus Village Pool 4 Feb, 7 Cambus West Pool 30 Sep & 5 Gartmorn Dam 16 Oct. (NB AET).
Breeding: 2ads. + 5 juvs Inglewood Pond 6 Sep, ad. with 3 juvs. Tullibody Pond 1 Oct (NB).

- S Only 1 bird was recorded during WeBS counts (Sep-Dec) along 34.4km of the R. Forth (Gargunnock Br. - Fallin) compared to an annual mean of 33 birds (96-03), numbers during the Jan-Mar period were normal. Site max: 14 Airthrey Loch 8 Jan, 9 Doune Ponds 18 Jan, 9 Vale of Coustry 29 Sep, 6 R. Teith, Callander 7 Dec (MVB AD NB).
Breeding: Airthrey Loch: brood of 5 on 12 May, fully grown juvs. on 19 Aug were first fledged birds for some time, 1 ad. + 2 juvs. 19 Sep (MVB MK).
- COOT *Fulica atra* (B, W)
WeBS max: 757 inland in Jan & 804 in Dec (very few on linear water features).
F 57 Little Denny Res 15 Dec (NB).
C 494 Gartmorn Dam 1 Feb & 455 on 13 Nov (AET).
Breeding: Gartmorn Dam: 1 building nest 27 Mar, broods of 2,2 & 1 chicks 27 Jun, 2 on nest + broods of 2, 1, 1, 1, 1, 1 & 1 on 17 Jul, broods of 1,3, 2 & 1 on 22 Aug, juv. Blackdevonmouth 11 Jul, 1 on nest Cambus Village Pool 1 Aug (AET CJH).
S Max 207 Lake of Menteith 18 Dec.
Breeding: Airthrey Loch: Building nest 27 Mar, 10prs. of which 2 occupied, 6 broods 12 May, none from late May, 1 juv. 19 Aug, pr & 2 on nest Cambusmore/Gart GPs 20 Jun, 1 juv. Castle Business Park, Stirling 15 Sep (AET MVB DT NB).
- OYSTERCATCHER *Haematopus ostralegus* (B,W)
WeBS estuary peaks in each winter were 139 Feb and 150 Dec.
F 82 Kincardine Br. & 33 Kinneil on 22 Feb were highest counts in the year (MVB, JC, MT). 150 back at Kinneil on 25 Jul, 101 there on 13 Dec, 2 the peak at the year end. 65 Kincardine Br. to Alloa on 14 Nov (DT, MVB, DM). 100 Blackness on 26 Sep & 34 there on 22 Nov (AB, DB).
C Three Gartmorn on 22 Feb (AET).
S Three Airthrey on 11 Jan first back inland, 1 Doune on 5 Feb & 3 Carron Valley Res on 14 Feb (CJH, DOE, DAC). The only pre-breeding flock in 3 figures was 150 Craigforth on 27 Feb (DT); just a few years ago there would have been about twice as many there at that time. 4 prs. Cambusbeg on 1 Jun was only breeding record received. 100 Killin on 30 Jul was the largest post-breeding flock reported (PWS).
- *AVOCET *Recurvirostra avosetta*
F Three Kinneil on 15 Apr (RS, AS).
- *LITTLE RINGED PLOVER *Charadrius dubius*
F A good series of records from Skinflats pools where 1 on 9 May, an adult on 3 & 4 Jul, an ad. + imm. on 5 Jul, 1 ad. on 7 Jul & 28 Aug (RS, GO, AB). Could this species be nesting on an industrial site at Grangemouth ?
S One Gart on 20 Jun (DT).
- RINGED PLOVER *Charadrius hiaticula* (b,W)
WeBS estuary peak of 87 in Sep.
F One Blackness on 27 Feb was the only record in the first winter period (AS). 9 Skinflats pools on 5 Apr the only spring record (DT). 8 there on 7 Jun, 9 on 9 Jun, 2 on 27 Jun, 5 on 7 Jul & 4 on 29 Jul (GO, AB, AET). 13 Kinneil on 1 Jul the first back there with an unusually large flock of 77 on 18 Sep, a more normal 38 on 24 Sep & 35 on 18 Dec (JC, DT). 8 Skinflats on 17 Aug the largest autumn total there (GO). 25 Blackness on 26 Sep & 22 on 31 Oct (AB).
C Eight Kennetpans on 22 Feb (CJH).
S One L Breaclauch on 22 May, 1 pr Gart on 20 Jun (PWS, DT).
- DOTTEREL *Charadrius morinellus*
2003 Correction. The records of 1 Skinflats 28 Aug to 4 Sep and 1 Kinneil on 19 Sep were erroneous, these were Spotted Redshank.

GOLDEN PLOVER *Pluvialis apricaria* (B,W)

WeBS estuary peaks in each winter were 415 Jan and 1580 Dec.

- F 415 Kinneil on 18 Jan was the largest flock early in the year with 42 Skinflats on 22 Feb the only record there and the last sighting of the winter. 1 Skinflats on 6 Jul the first returning bird with 15 on 20 Jul and 22-23 there mid-Aug to early Sep then 326 on 29 Sep (AET, GO). 750 Kincardine Br. on 16 Oct and 610 Skinflats on 14 Nov (MVB, MT). 120 Kinneil by 19 Oct with a large flock there later in the autumn: 1200 on 30 Oct, 2630 on 11 Nov & 1580 on 13 Dec (MVB, JC, DT). 100 Blackness on 26 Sep (AB).
- S Four Lecropt on 20 Mar (DT). Has almost disappeared as a passage and wintering bird on the Carse of Stirling.

GREY PLOVER *Pluvialis squatarola* (W)

- F One Skinflats pools on 31 May the only spring record (AB). 2 returned there on 16 Aug with 14 on 29 Sep, 25 on 12 Oct, 50 on 16 Oct, 3 on 11 Nov & 1 on 22 Nov the last (GO, AB, MVB). 2 Kinneil on 14 Nov the only sighting there (JC).

LAPWING *Vanellus vanellus* (B,W)

WeBS estuary peaks in each winter were 892 Jan and 3277 Nov.

- F 886 Kinneil on 18 Jan was the largest flock early in the year with much smaller nos. Skinflats, 106 there on 16 Feb the peak. Birds returning to the estuary in small numbers by late May with 116 Skinflats pools by 27 Jun. 600 Kinneil on 28 Aug & 1000 Skinflats on 18 Sep then some large flocks later in the autumn with 2336 Skinflats on 14 Nov and 2110 Kinneil on 13 Dec (JC, AB, MVB, DT, MT).
- C 501 Alloa Inch to Cambus on 16 Oct (AET). The flocks in this area are generally much smaller than a few years ago.
- S 75 Lecropt on 11 Jan, 23 Argaty on 7 Mar, 45 Gart on 6 Jul, 125 Lecropt on 26 Sep (DT, DOE). A poor showing, is this a genuine reflection of declining numbers in the Forth and Teith valleys?

KNOT *Calidris canutus* (W)

WeBS estuary peaks in each winter were 1335 Jan and 3960 Dec.

- F Kinneil as usual held by far the largest nos. but on some dates not all the flock roosts there and the missing birds are not picked up elsewhere in the inner Forth by the WeBS counts. 3500 Kinneil on 2 Jan was the largest total early in the year by some 2000 birds, 1335 on 18 Jan, 1192 on 21 Feb falling to 559 by 21 Mar, with 250 on 5 Apr & 60 on 3 May. Small nos. during the summer with 4 on 15 Jun, 13 on 26 Jun & 4 on 18 Jul with 128 returned by 11 Aug. A slow autumn build up with 300 by 25 Sep, 510 on 16 Oct, 2570 on 11 Nov and 3960 on 13 Dec (MVB, JC, RS, DT). Scarce as usual at Skinflats with 2 at the pools on 31 May, 43 on 17 Aug and 176 on 13 Oct (GO, MVB). 60 Blackness on 26 Sep (AB).

*SANDERLING *Calidris alba* (p)

- F One Kinneil on 18 Jul & 2 there on 11 Aug (DT, RS). 3 Skinflats pools on 17 Jul, 1 on 17 Aug, 2 on 22 & 23 Aug, 1 on 26 & 30 Aug (GO).

*TEMMINCK'S STINT *Calidris temminckii*

- F One Skinflats pools on 3 & 4 Jul (GO, RS).

*CURLEW SANDPIPER *Calidris ferruginea* (p)

- F One Kinneil on 31 May was the only spring bird (AB, GO, RS, AET). 3 Skinflats pools on 20 Jul were early, more typically 2 there on 2 & 3 Sep, 1 on 4 Sep, 11 on 15 Sep, 14 on 18 Sep & 2 on 29 Sep (GO, MVB). At Kinneil 1 on 28 Aug & 11 Sep, 2 on 18 Sep (RS, DT, JC).

Area summary (bird-days/half month)

Jul	Aug	Sep
0 3	0 1	17 20

DUNLIN *Calidris alpina* (b?,W)

WeBS estuary peaks in each winter were 4861 Jan and 6426 Dec.

F Rather low nos. at Skinflats in both winters with 2870 on 18 Jan, 1500 on 22 Feb, 2140 on 14 Nov and only 920 on 12 Dec (MVB, MT). Also low nos. Kinneil in the first winter period with 2060 on 22 Feb the most, falling to 309 by 21 Mar, 470 on 4 Apr (JC, AJ). Small nos. remained on the estuary from May to July with 52 Skinflats on 7 May, 35 there on 9 Jun and 65 Kinneil on 18 Jul (GO, AB, DT). 2063 Kinneil by 16 Oct, 2640 on 14 Nov & 5500 there on 13 Dec by far the largest flock at the year end (MVB, JC).

S Seven Killin, Loch Tay on 4 May (PWS).

RUFF *Philomachus pugnax* (p)

F One wintered Skinflats moving between the pools and the Carron, noted on 13 & 18 Jan and 16 & 21 Feb (MVB, AB, RS). 2 Skinflats pools on 5 Apr the only spring record (DT). First autumn bird was 1 Skinflats pools from 17 Jul to 9 Aug then 11 on 13 Aug, 8 on 16 Aug, 7 on 5 Sep & 8 on 28 Sep the largest nos. with up to 5 remaining to 16 Oct (GO, MVB, AB, DT). One again on Carron, Skinflats on 12 Dec (MVB). At Kinneil 1 on 12 Aug, 4 on 20 Aug and 1-2 birds to 15 Sep (GO, DT).

Area summary (bird-days/half month)

Jul	Aug	Sep	Oct
0 2	17 15	26 13	15 5

*JACK SNIFE *Lymnocyptes minimus* (w)

F Three Kinneil on 7 Jan, 2 on 10 Jan, 1 on 29 Feb & 6 Mar (RS, DT). In autumn 9 Skinflats saltmarsh on 26 Oct (AMf), 6 Kinneil on 30 Oct & 8 there on 28 Nov (DT).

S One Lacropt on 17 Jan & 10 Mar and in autumn 2 on 6 Nov & 3 on 11 Dec (DT).

SNIFE *Gallinago gallinago* (B,W)

F 32 Skinflats on 11 Aug and 23 Kinneil on 30 Oct the largest flocks at these sites (RS, DT).

C 13 Gartmorn on 17 Oct & 20 Nov (AET).

S Drumming Drumloist on 10 Jun (DOE) was the only record of a displaying/ breeding bird. 57 Lacropt on 31 Oct, 36 on 20 Nov & 19 Dec (RD, HD, DT).

WOODCOCK *Scolopax rusticola* (B,W)

Another species grossly under-recorded during the breeding season.

F One Cowie on 21 Jan (DOE).

C One roding near Dollar on 6 Jul (DT).

S 20+ Garguncock on 31 Jan and several roding there on 14 Apr (AMf). 1 Braeval on 2 Nov & 1 Stronachlachar on 14 Nov (DJC).

BLACK-TAILED GODWIT *Limosa limosa* (W)

WeBS estuary peaks in each winter were 232 Feb and 294 Dec.

F This species is now present throughout the year at Grangemouth. Monthly peaks at Kinneil were: 69 Jan (7 & 18th), 230 Feb (22nd), 175 Mar (25th), 107 Apr (16th), 88 May (17th), 65 Jun (15th), 178 Jul (28th), 239 Aug (12th), 196 Sep (18th), only 25 Oct (16th), 390 Nov (11th) and 290 Dec (13th) (MVB, JC, GO, DT). Generally low nos. Skinflats pools at both ends of the year; the lower water levels may not suit this species. 31 there on 21 Mar, 24 on 5 Apr, 76 on 23 Apr & 34 on 10 May in spring. 47 there on 17 Jul, 21 on 30 Aug & 44 on 12 Oct the largest numbers in autumn (GO, MVB, AB, RS, JT, DT). 77 Grangepans on 18 Sep (JC) and 4 Blackness on 6 & 13 Nov (AET) the only birds away from these sites.

C One Cambus Pools on 7 Apr and 10 Cambus Village Pool on 18 Apr (AET).

BAR-TAILED GODWIT *Limosa lapponica* (W)

WeBS estuary peaks in each winter were 178 Jan and 173 Dec.

- F This is now the scarcer of the two godwits and is rarely found away from Kinneil. 240 Kinneil on 2 Jan, 178 on 18 Jan & 158 on 22 Feb the largest totals early in the year (MVB, JC). 3 there on 13 Jun and 3 in breeding plumage on 1 Jul (DT). Low nos. (<30 birds) in autumn until late Nov with 160 on 28 Nov & 173 on 13 Dec the maxima (MVB, JC, DT). Elsewhere 1 Skinflats on 7 May and 1-3 birds there on 5 dates 17 Jul to 28 Sep, 3 Kincardine Br. on 16 Oct (GO, AB, AET, MT). 100 Blackness on 26 Sep (AB).

WHIMBREL *Mumenius phaeopus* (p)

- F Six Skinflats on 24 Apr and 1 on 1 & 10 May the only spring reports (RS, GO). 1 there on 16 Jun (RS) was probably returning south, main passage from early July to end August. 3 Skinflats on 5 Jul, 1 on 10 Jul, 2 on 18 Aug & 1 on 22 Aug (RS, GO). At Kinneil 1 on 25 Jul, 2 on 11 & 13 Aug, 6 on 20 Aug, 2 on 22 Aug, 1 on 11 & 18 Sep (DT, JC).

Area summary (bird-days/half month)

Jul	Aug	Sep
4 1	4 11	2 1

CURLEW *Numenius arquata* (B,W)

WeBS estuary peaks in each winter were 773 Jan and 1160 Dec.

- F 460 Skinflats on 18 Jan falling to 249 by 21 Mar. 190 Kinneil on 8 Feb the most there early in the year. Low numbers on the estuary during April and May with birds returning in late June, 446 Kinneil by 21 Jul. Later 260 there on 14 Nov and 587 Skinflats on 12 Dec (MVB, JC, MT).
- C 207 Kennetpans on 18 Jan & 172 there on 16 Oct, 72 Cambus pools on 18 Feb, 196 flew downriver Cambus on 7 Apr, 314 The Rhind, Alloa on 12 Dec, 185 Blackgrange on 18 Dec (CJH, DM, AET, MT, RD, HD).
- S 120 Lacropt on 27 Feb the only flock of note (DT).

*SPOTTED REDSHANK *Tringa erythropus* (p)

- F Four Kinneil on 11 Aug and 1 Skinflats on 25 Sep the only records (RS, DAC).

REDSHANK *Tringa totanus* (B,W)

WeBS estuary peaks in each winter were 1506 Feb and 2510 Dec.

- F 741 Skinflats on 22 Feb the maxima early in the year, more in the second winter period with 1000+ from October with 1180 on 14 Nov the most (MVB, MT), a return to previous status. At Kinneil 698 on 22 Feb falling to 250 by 4 Apr. 1150 returned by 6 Aug, with 827 on 18 Sep, 854 on 14 Nov & 1190 on 13 Dec (MVB, JC, AJ, DT). 127 Blackness on 18 Sep (DB).
- C 105 Kennetpans on 18 Jan & 62 there on 24 Oct, 68 Alloa Inch on 12 Dec (CJH, AET).
- S Five Lacropt on 8 Mar (DT). Birds recorded at five potential breeding sites during the spring: 1 pr. Dalbrack, Braes of Doune on 28 Mar, 1 pr. Cambusmore on 24 Mar, 2 prs. Loch Tay, Killin on 8 Apr with 1 pr. later in the month, 1 Buchlyvie on 18 May, 2 Kippen Muir on 30 May (DOE, DAC, PWS).

GREENSHANK *Tringa nebularia* (p)

- F Recorded in the Grangemouth area in every month except June with wintering birds now the norm. One Skinflats on 9, 14, 18 & 22 Jan, 7 Feb & 7 Mar (MVB, AB, DAC, GO, RS). Single spring birds Skinflats on 2 May and Kinneil on 26 May (RS, DT). A prolonged return passage from early July to mid-October with 1 Skinflats on 3 Jul, 3 on 6 Jul, 2 on 25 Jul, 7 on 9 Aug, 16 on 17 Aug, 11 on 26 Aug, 10 on 2 Sep, 8 on 11 Sep, 9 on 28 Sep and 6 on 12 Oct, then lower nos. with 2 on 9 & 22 Nov and 18 Dec and 3 on 12 Dec (MVB, AB, GO, RS, JT, DT). At Kinneil 1-2 from 3 Aug to 11 Nov with 5 on 12 Aug & 4 on 8 Sep the most (MVB, JC, GO, DT). 2 Blackness on 26 Sep & 1 there on 19 Dec (AB, MA).

C Four Cambus Pools on 3 Aug & 1 on 4 Aug (AET).
 Area summary (bird-days/half month)

Jul	Aug	Sep	Oct	Nov
6 16	31 72	59 23	21 116	2

GREEN SANDPIPER *Tringa ochropus* (p)

F Two Skinflats on 6 & 10 Jul, 1 on 3, 9 & 31 Aug (MVB, AB, GO, RS, JT). 1 Kinneil on 6 Aug (DT), 1 Carron, Bonnywater confluence on 30 Aug (MA).

S One Lectorpt on 28 Nov (RD, HD).

COMMON SANDPIPER *Tringa hypoleucos* (B)

F One Camelon on 21 Apr (MA). Main return passage mid- late July. One Kinneil on 1 Jul the first, 4 on 25 Jul, 6 & 28 Aug the most there (DT). At Skinflats pools 1 on 4 Jul, 3 on 6 Jul, 5 on 17 Jul, 6 on 25 Jul, 3 on 26 Jul, 1 on 16 Aug & 1 on 5 Sep (GO, AB, DT, JT). Three Higgins Neuk on 22 Aug (JT). A late bird Kincardine Br. on 16 Oct (MT).

C Passage birds on the Forth at Cambus from 11 Jul to 8 Aug with 7 on 11 Jul & 5 on 4 Aug the most (AET).

S The first birds were 1 Dunblane on 18 Apr, 2 Lake of Menteith and 1 Killin on 22 Apr (MVB, RAB, PWS). Three Lectorpt on 12 Jul, 1 Cambusmore on 30 Jul the last reported inland (DT, PWS).

Estuary summary (bird-days/half month)

Jul	Aug	Sep	Oct
18 34	12 9	1 0	0 1

TURNSTONE *Arenaria interpres* (W)

F One Kinneil on 22 Feb and 17 Blackness on 17 Apr the only records in the first winter period (JC, MA). In autumn 1 Kinneil on 20 Aug & 24 Sep with 2 on 30 Oct and at the year end 2 West Grangemouth on 12 Dec (DT, JR, MVB).

*POMARINE SKUA *Stercorarius pomarinus*

F Two Skinflats on 12 Oct flew inland SSW (GO).

ARCTIC SKUA *Stercorarius parasiticus* (p)

F A good autumn with a number of late birds. 1 Kinneil on 25 Aug, 2 on 28 Aug, 3 on 24 Sep & 6 on 25 Sep (DT) were fairly typical. Two Blackness on 26 Sep & 5 on 3 Oct (AB). A number of birds in the Skinflats area and upstream in the second week of October with 1W Skinflats on 7th & 4W on 11th (GO). 5 Skinflats on 12 Oct, 8 Kinneil and 5 Kincardine Br. to Dunmore on 16 Oct, 8 Airth to Dunmore on 24 Oct (GO, JC, MVB, AET). Later 2 Kinneil on 30 Oct, 1 Dunmore on 11 Nov, 2 Kincardine Br. on 14 Nov (DT, AB, MVB).

*LONG-TAILED SKUA *Stercorarius longicaudus*

F One imm Skinflats on 11 Oct flew W with Arctic Skuas (GO). 1 Kinneil on 16 Oct (JC).

*GREAT SKUA *Stercorarius skua*

F Two Kinneil on 16 Oct (JC).

*LITTLE GULL *Larus minutus*

F One 1st sum Skinflats on 27 May with 3 on 7 Jun, 1 on 27 Jun & 7 Jul then 1 ad. on 17 & 22 Aug (RS, AB, GO, AET). 1 Kinneil on 11 & 25 Aug (DT), single birds Grangepans, Kinneil and Skinflats on 16 Oct, 3 Kinneil on 30 Oct (AB, JC, DT).

*MEDITERRANEAN GULL *Larus melanocephalus*

F One Kinneil on 13 Aug (DT, BNS). One 2nd W Airth on 3 Nov (RJD) and on 3 & 28 Dec (RHD). The latter three sightings, at least, may all relate to the same bird.

BLACK-HEADED GULL *Larus ridibundus* (B,W)

No reports from breeding sites.

F 4300 Skinflats and 730 Kinneil roosts on 17 Jan (MVB, JC).

- S 200 "anting" BoA on 14 Aug (CJH).
- COMMON GULL *Larus canus* (B,W)
- F 300 Skinflats and 1570 Kinneil roosts on 17 Jan (MVB, JC).
- C Nest with 3 chicks Menstrie bond on 3 Jul (AET).
- S Breeding: 10prs. Loch Ruskie on 17 Apr, 6 prs Loch Arklet on 22 May & 50 L. Breaclaich on 22 May (DOE, PWS).
- LESSER BLACK-BACKED GULL *Larus fuscus* (b,S)
- F Small numbers on the estuary through both winters. At least 30 nests Grangemouth on buildings along Carron on 9 Jun, 23 juv Skinflats pools on 19 Jul (AB).
- C Three nests Menstrie bond on 3 Jul (AET).
- S 290 roosting on newly sown field Argaty on 29 Aug (MVB).
- HERRING GULL *Larus argentatus* (b,S,W)
- F 5300 Skinflats and 1199 Kinneil roosts on 17 Jan (MVB, JC). At least 2 nests on buildings Grangemouth Carron on 9 Jun (AB).
- C 1250 Cambus on 18 Feb (CJH).
- GREAT BLACK-BACKED GULL *Larus marinus* (S,W)
- F Kinneil had the largest concentration along the estuary with 140 on 2 Jan and 85 on 14 Nov (CJH, JC). 256 roosted there on 17 Jan (JC). 51 at landfill Carron works on 12 Dec (MA).
- *KITTIWAKE *Rissa tridactyla* (P,w)
- F 80 Kinneil on 15 Jun, 14 on 6 Aug & 6 on 16 Oct (DT, JC). 60 Skinflats on 11 Oct & 3 on 12 Oct (GO).
- C One South Alloa on 16 Oct (RHD).
- SANDWICH TERN *Sterna sandoicensis* (P)
- F As usual the largest numbers were east of Grangemouth during September. 1 Skinflats on 6 Jul the first reported with 17 on 17 Aug the most there (AET, GO). 100 Kinneil on 11 Sep & 20 there on 25 Sep, 52 Carrind to Grangepans on 18 Sep, 150 Blackness on 26 Sep, 4 Kinneil on 16 Oct the last (AB, JC, DT).
- C 25 South Alloa on 11 Sep (RD, HD).
- COMMON TERN *Sterna hirundo* (B)
- F Four Kinneil on 3 May the first reported with 3 Skinflats pools on 10 May & 55 there on 31 May. 140 adults Grangemouth docks colony on 21 Jul (AB, MVB, DT). Late birds were 1 Kinneil on 1 Oct & 1 Kincardine Br. on 16 Oct (DT, MT).
- *ARCTIC TERN *Sterna paradisaea*
- F One Kinneil on 25 Sep (RD, HD).
- *BLACK TERN *Chlidonias niger*
- F One imm Skinflats on 13, 14 & 18 Aug (GO, RS, AET, AH). One on 12 Oct with another flying east (GO).
- *WHITE-WINGED BLACK TERN *Chlidonias leucopterus*
- F 1 ad. Skinflats pools 12-14 Aug (AB, GO, RS, AET, AH). The first record for the area.
- GUILLEMOT *Uria aalge* (W)
- A large influx mid-October. The WeBS estuary count on 16th found 276: 23 Kinneil, 61 Skinflats, 53 Kincardine Br. to Alloa, 124 Alloa to Cambus and 15 Fallin.
- F Other records were 1 Kinneil on 15 Sep, 96 Skinflats on 11 Oct & 43 on 12 Oct, 114 Dunmore on 13 Oct (DT, GO, MVB).
- C Three Alloa to Cambus on 14 Nov (AET).
- S One Loch Ard on 23 Sep (DOE).

*RAZORBILL *Alca torda* (w)

- F One Carriden to Grangepans on 16 Oct (JC).
 S One Craigforth on 1 Oct (DOE). Inland birds are very unusual.

FERAL PIGEON *Columba livia* (B,W)

The BBS figure of 5.8 birds/10 km in 2004 was 51 % below the long-term mean¹.

- F 100 Haircraigs, Denny 9 Sep & 5 Nov, 550 Skinflats 16 Oct (JS, MVB)
 S 116 Killin 8 Jul, 150 Stonehill Farm, Dunblane 17 Oct, 116 Kinbuck 26 Nov & 180 there 4 Dec (NDC, MVB)

STOCK DOVE *Columba oenas* (B,W)

Occurs in low numbers on BBS transects. The BBS figure of 0.9 birds/10 km equalled the highest score since 1997.

- F Recorded Skinflats April to June & August to October with max of 22 on 27 Apr and 36 on 1 Oct. 6 Kinneil 12 Aug & 36 there 4 Sep (GO, AB, DT).
 C 45+ Gartmorn Dam 19 Dec.
 S Pair inspecting hole in Ash tree, Carse of Thornhill 30 Apr with 2 there 21 Dec. Pair Lanrick, Teith 22 May (DJC, DOE).

WOODPIGEON *Columba palumbus* (B,W)

Greatly under-reported. BBS figure of 34.4 birds/10 km was about average (+4 %).

- F 375 R. Carron at Camelon Cemetery 2 Jan (MA).
 C 200 R. Devon at Alva 22 Feb. An unusual behaviour pattern was observed at the Blackdevon wetland where a bird flew low over the R. Forth and dipped six times without landing (to drink ?) (JT, CJH).
 S 400 Lecropt 9 Apr (DT).
 S 2002: 400 West Cambushinnie, Kinbuck 25 Mar (NB).

COLLARED DOVE *Streptopelia decaocto* (B,W)

Greatly under-reported. The 2004 BBS figure of 1.7 birds/10 km is well down on 2003 (-43 %) but only 29 % down on the long-term mean.

- F 11 Skinflats 4 Sep (GO).
 S Six Dunblane garden 20 Nov & pr. mating there 12 Dec (NB).

CUCKOO *Cuculus canorus* (B)

Occurs in low numbers on BBS transects. The 2004 figure of 1.4 birds/10 km was the highest since 1997 and well above the long-term mean.

First record: male Glen Buckie 23 Apr was 5 days later than in 2003. Then males singing 24 April Drumloist, Braes of Doune & Torrie, Callander and non-singing bird Cambusmore same day, followed by 2 males singing Flanders Moss 1 May (DJC, DOE, PWS).

- F Males singing Howierig, High Bonnybridge 16 May & Newcraig Cottages, NW of Slammanan 23 May. Singles Carron Glen 30 May, Skinflats 1 Aug (MA, AS, RS).
 S One Sheriffmuir 9 May, 3 Cromlix Braes 10 May, 2 Tom Dubh, Callander 12 May, 1 Lecropt flew high N 25 May, 1 Drunkie Burn & 2 Glen Lochay 26 May, 1 Loch Laggan, Kippen 30 May (DT, DP, ES, BKB, DAC)

BARN OWL *Tyto alba* (b,w)

Does the increasing number of reports from the Stirling/Clackmannanshire boundary (1 report) and Falkirk (5 reports) indicate a local increase in and gradual spread from the core south-east Stirlingshire area? The number of road casualties is worrying, while spring and summer records remain rare.

¹ BBS data from 1994 to 1996 have been excluded from the long-term mean due to the small size of squares surveyed. The mean therefore refers to the period 1997 to 2003. In 2004 12 km were surveyed. Absolute numbers for several species are small, which should be borne in mind when interpreting the data.

- F One Champany, SW of Blackness 2 Feb; 1 Wholeflats Rd., Grangemouth 29 Sep; 1 Manor Powis 1 Nov; 1 Haircraigs, Denny was flying besides a car 5 Nov; 1 Upper Kinneil 23 Dec. A young M on A905 at Skinflats 25 Sep, a juv F on M9 at Polmont Kinneil Mills 5 Dec and another bird on A904 by R. Avon, Grangemouth 28 Dec unfortunately were road casualties (AMf, RHD, RS, NDC, AMf).
- C One seen alongside a car on the A907 near Manor Powis 30 Oct would be the first Clackmannanshire record since 1996 and only the third record in the last 25 years, if on the Clackmannanshire side of the road (NDC).
- S One along the A811 at Gargunock 14 Jan, 1 along the A811 near Kippen 19 Feb & 1 on fencepost by A803 near Lathallan 26 Feb were the only winter records of the early part of the year. Singles at Killin 5 & 8 Jul were followed by road casualties on the M9 at Lecropt 2 Aug & on the M80 near Stirling 28 Aug (AMf, NDC, NDM, NB). There were 10 winter records from the later part of the year. One F on M9 at Letham 4 Oct was a road casualty. One on A811 near Stirling 16 Sep, 2 Gargunock 23 Oct & 1 there on A811 15 Dec. F on M9 at Kinnaird, Stirling & M on M9 at Pirnhall, Stirling were both road casualties on 3 Nov. 1 on A811 near Kippen 4 Nov, 1 Ashfield 24 Nov flew towards Glassingall Estate, 1 by B826 between Doune and Thornhill 24 Nov & 14 Dec. One Blairdrummond 4 Dec, 1 on fence post of A84 at Drip Road, Stirling 5 Dec, 1 on A91 near Stirling 9 Dec was a road casualty, M at Thornhill 13 Dec & 1 R. Teith, Doune 25 Dec (AMf, DAC, NDC, DJC, DK).
- TAWNY OWL *Strix aluco* (B,W)
As in the previous two years none were recorded on BBS transects.
- F Bird nested in Grangemouth warehouse and apparently fledged 2 y. Singles Bo'ness 18 Feb & 13 Dec, Blackness 15 Jun, Skinflats 25 Dec (AS, RS, GO).
- C Birds calling Tait Place, Tillicoultry Jan to Mar, Jul & Oct to Dec with up to 3 on 16 Feb & 2 Oct. Up to 3 calling around Gartmorn Dam 17 Oct & 13 Nov. Singles Castlebridge, Forestmill 1 Nov (calling) & Aberdona Wood 30 Nov (AT).
- S Single Cowie, 3 Jul. 3 juvs. L. Ard Forest 12 Jul. Singles L. Doine 16 Jan (calling 1.30pm), Killin 7 Jul, Aberfoyle Holiday Park 12 Jul, R. Teith, Doune 14 Nov, Kippen 29 Dec (RS, JT, NB, RD, RM, RG, DAC).
- *LONG-EARED OWL *Asio otus* (b,w)
F Single Skinflats 7 Jun; juv. Wester Moss, Fallin & road casualty on A91 by Bannockburn 26 Nov (GO, RHD).
- SHORT-EARED OWL *Asio flammeus* (b,W)
For this rather local breeder, a more systematic survey of known breeding areas (e.g. Ochils) and potential breeding sites would be of value. One bird/10 km on BBS transects was equal to the long-term mean.
- F Pair Cringate Moor 5 May. 1 Kinneil 1 & 30 Oct, 2 on 18 Dec. One Skinflats 11 Jan & 1 hunting over seawall at Orchardhead, Skinflats Oct to Dec. (GO, JR, DT, AMf).
- S One Lecropt 8 Mar, 1 L. Arklet 6 Oct & 6 to 7 there 7 Oct (DT).
- *NIGHTJAR *Caprimulgus europaeus* (b)
S The last remaining breeding site remains occupied at L. Ard Forest, where 1-2 birds seen and heard churring 26 Jun & 22 Jul (KE, JNW).
- SWIFT *Apus apus* (B)
Occurs in low numbers on BBS transects. The 2004 BBS score of 1.8 birds/10 km was the second lowest since 1997 and was only 36 % of the long-term mean. After last year's very early arrival of 13 Apr, the first birds this year appeared at a more conventional time with 1 Bo'ness 29 Apr followed by 4 Lake of Menteth & 1 BoA 30 Apr; 1 Doune 2 May; 1 Dunblane Hydro & 6 Lecropt 3 May;

3 Riverside, Stirling 8 May; 4 Dunblane 14 May; 5 Aberfoyle 16 May (AS, DJC, CJH, DOE, NB, DT, JNW, MVB). Last dates were 1 Dunblane Hydro & Stirling 10 Aug, 2-3 Riverside, Stirling 11 Aug; 6 BoA & 4 Doune 14 Aug and Skinflats 26 Aug, which was 10 days later than in 2003 (MVB, DT, JNW, CJH, DOE).

- F 56 Skinflats 24 Jun, 70 Kinneil 11 Jul (GO, DT).
 C 10 Clackmannan Tower 15 Jun, 17+ Cambus Pools 19 Jul (NB, AET).
 S 20 to 30 Calander 9 Jun, 40 BoA 16 Jul and 20 here 26 Jul, 20 Aberfoyle 22 Jul, 25 Doune 29 Jul, 52 Dunblane Hydro 30 Jul. At Riverside, Stirling May to Aug with max. 30 on 20 & 22 Jul (DJC, CJH, JNW, DOE, MVB).

KINGFISHER *Alcedo atthis* (b,w)

As for the previous three years, was not recored on BBS transects.

Only four records from the breeding season. There were more sightings in Clackmannanshire than in previous years.

- F Singles seen regularly Kinneil 11 Aug to 28 Nov. Up to 2 birds present on R. Carron on M876-Larbert and Larbert-Carronbridge stretches Jan, Mar & Sep to Dec, with up to 3 (2 ads., 1 imm.) on Carronbridge-Carron House stretch Sep & up to 2 there in Oct. Single on Black Burn at Blackness 2 Sep. Two birds Pow Burn 1 Sep and 1 there 7 Oct. Single Powfoulis 7 Oct (RS, DT, MVB, MA, AB, AMf).
 C Singles at Naemoor Farm Pond, Yetts o' Muckhart 11 Feb; on R. Devon at Cambus 4 Aug & 11 Dec, between Cambus Weir and A907 19 Nov & 15 Dec, between Alva & Tillicoultry 7 Nov. Between Tillicoultry & Dollar in Feb, Mar, Jul, Sep & Oct with 4 there 26 Nov; at A91 bridge, Yetts o' Muckhart 2 Jun and nearby at Fossoway, 11 Dec. Singles on R. Black Devon at Back Wood 10 May & Blackdevonmouth Marshes 11 Jul (JG, DE, AET, DAC, CJM, GEL, DM, NB, KW).
 S Singles R. Forth at Allan Water/R. Teith confluence 17 Jan; Lecropt 17 Jan & 31 Oct; L. Watston 25 Jan; Kinbuck 22 Apr & 4 Dec; Braes of Doune, Kilbryde 14 Aug; Airthrey 19 Aug with 2 there 15 Dec, Cambusmore/Gart GPs late Jul to mid-Oct; on R. Teith at Deanston 8 Jul, at Callander 26 Oct, on Doune-Wester Row and Wester Row R. Forth confluence stretches Sep to Dec; on Strathyre garden fence 19 Sep; L. Lubnaig 22 Sep & 26 Oct; West Mains Pond 6 Nov and Drumbowie Res. 23 Nov (DT, DK, MVB, DOE, NB, DT, MW, DK, KP, RHD, DJC, RHD, MA).

GREEN WOODPECKER *Picus viridis* (B,W)

All records from south-east of recording area. Records from north-west remain scarce. Recored in very small numbers on BBS transects. The BBS figure of 0.1 birds/10 km was average.

- F Singles at Rough Castle Woodland (planted opencast bing) 4 Jan (MA).
 C Bird calling Bard's Lea, Tillicoultry throughout spring with juv. there 25 & 27 Jul; present to 10 Aug. M 13 Jul Castlebridge, The Forest (AET, AH).
 S Singles Braes of Doune, Kilbryde 10 Apr, Plean CP 3 & 12 Apr; Doune 16 Apr; Braes of Doune, Argaty 21 Apr; Blairlogie 12 Jun; BoA 29 Jul. Bird calling Duchray Castle, L. Ard Forest 31 Jul (AB, DAC, SD, DOE, AET).

GREAT SPOTTED WOODPECKER *Dendrocopus major* (B,W)

The BBS figure of 0.6 birds/10 km was twice that of 2003 and of the long-term mean but absolute numbers are small.

- F Singles Wallacebank 17 Apr & 8 Jun; Larbert House 13 June (MA), Carron House, Carronshore (male) 11 Dec (AS, AB).
 C Singles Castlebridge, The Forest 20 & 21 Jan.; Gartmorn Dam 13 Apr & 16 May, Gartmornhill Wood 17 Oct. Male drumming then entered nest hole Back Wood, Clackmannan 26 Apr. Singles Lookaboutye, Clackmannan 28 Apr; Tait Place, Tillicoultry throughout June with female & juv there 26 Jun. Singles Devon

- Way, Tillicoultry 10 Jul; Cambus (male) 13 Nov (AET, NB, DAC, CJM).
- S Male Alexander Drive, BoA 25 Jan & 22 May, female there 29 Aug. Singles Callander 16 Feb, Plean CP 3 Apr & Nov-Dec (males); Carron Glen 24 Apr & 15 Jun; L.Voil 28 Jun; Pass of Leny, Callander 14 Sep. Pair near L. Lubnaig 23 Oct. Singles Gart 2 Oct; Newton Crescent, Dunblane 29 Oct, Lecropt 6 Nov. Males Blairdummond Moss 21 Dec & Kippen garden end Dec (MVB, NB, DJC, AB, DAC).
- SKYLARK *Alauda arvensis* (B,W)
The BBS figure of 19.3 birds/10 km reversed the decline seen since 2000 and was slightly higher than the long-term mean (+8 %).
Singing Skinflats & Kinneil 8 Mar; in song still Skinflats 4 Nov (AB).
- F 33 Higgins Neuk 13 Jan (MVB).
C 34 Craigrie Fm., Clackmannan 23 Oct & 45 20 Nov (AET)
S 45 Lecropt 1 Feb. 40 Skinflats 16 Oct & 120 there 12 Dec (DT, MVB).
- SAND MARTIN *Riparia riparia* (B)
Occurs in low numbers on BBS transects. The 2004 BBS figure of 0.6 birds/10 km was higher than the crash recorded in 2003 but still 79 % below the long-term mean.
Arrival in March: 40 Lake of Menteith 23rd was 3 days earlier than in 2003 (Killin); ca. 23 Gartmorn Dam 30th, 50 Killin 8th April (DT, AET, PWS). No data on departure dates were received.
- F 250 Hawking over Kinneil wheat fields 21 Jul (MVB).
C At least 7 active nest holes R. Devon, N of Yetts o' Muckhart 2 Jun. Possibly bred Silverhills Pond, Alva (84 holes) (DM, NB).
2002: 5 active nest holes R. Devon, Alva 1 Jun (NB).
- S Up to 200 Cambusmore GPs from 24 Apr with last bird seen 1 Jul; believed to have bred. Up to 100 birds and nesting holes Killin 8 Apr to 31 Jul. 10 prs. Nether Moss 30 May. None nesting Cambusbeg GPs 1 Jun (PWS, NB, NC, CJH).
2002: 204 active nest holes Cambusmore 15 Jul (NB).
- SWALLOW *Hirundo rustica* (B)
The BBS figure of 18.5 birds/10 km was slightly higher than in 2003 (+12 %) but still 14 % lower than the long-term mean.
Comparatively late arrival in April: 1 over Buchlyvie garden 11 Apr was 12 days later than in 2003 (Braes of Doune-Balbrack). This was followed by singles Inverlochlarig, Carronbridge & Doune 15 Apr and 2 Kinbuck, Cambushinnie 17 Apr (DAC, DJC, DT, DOE).
- Last departures: 20+ Kinneil on 24th Sep dropped to 2 the following day. Likewise, only up to 3 birds in the Stirling & Lecropt area 26th with still 32+ at Gartmorn the same day and 25 Doune 30th. One Blairlogie & Skinflats 1st Oct, 1 Blackness 3rd, still 17 Gargunnoch 5th, 2 Airthrey 7th and a very late bird Blackness 4th Nov was 24 days later than in 2003 (Doune) but only 4 days later than in 2002 (Gallamuir) (DT, AET, DOE, AB, CJH, DJC, DAC).
No notable data on flocks were received.
- HOUSE MARTIN *Delichon urbica* (B)
The increase in numbers seen on BBS transects since 2000 came to an end. With 7.5 birds/10 km the 2004 figure was 42 % lower than in 2003 and 11 % lower than the long-term mean.
Arrivals in April: 1 Doune 18th was 3 days earlier than in 2003 (L. Menteith), then Stirling St. Ninians 19th and 10 Clackmannan 28th (DOE, DT, NB).
Departures in September were early: 3 Haircarigs 9th then 4 Lecropt 19th was 18 days earlier than in 2003 (BoA) and 7 days later than in 2002 (Doune) (JS, DT)
- F Three nests Bryce Avenue, Carron occupied early May with 15 birds last seen 14 Sep (AB).

- S 20 Glen Lochay 24 Jul (PWS).
 TREE PIPIT *Anthus trivialis* (B)
 A continuous decrease in numbers since 1998, when 2 birds were recorded per 10 km, saw no birds recorded in 2004.
 Arrival in April: 4 Strathyre 15th was 7 days later than in 2003 (Menteith Hills) and 6 Torrie, Callander 24th (DJC, DOE).
- C Bird singing Law Hill, Dollar 9 May (DT).
 S Bird singing Row, Dunblane 9 May. 1 Gargunnoch 12 Aug (DOE, AMf).
- MEADOW PIPIT *Anthus pratensis* (B,W)
 The 2004 BBS figure of 36.7 birds/10 km was the second lowest since 1997. It was well down (-41 %) on the 2003 score, which was the highest recorded so far, and 13 % below the long-term mean figure.
 Continues to be scarce mid-winter (only one record). Spring return: 70 Lecropt 1 Feb (DT).
- F 25 Skinflats 3 Jan & 30 there 18 Sep (AS, MVB).
 S 40 Lecropt 16 Apr. 25 Kinbuck Bridge 22 Apr, 50+ Killin Marshes 29 Sep (DT, MVB, NB).
- *ROCK PIPIT *Anthus petrosus* (w)
 At traditional sites.
 F One Pow Burn 5 Feb, 2 South Alloa 14 Feb & 1 there 30 Oct, 1 Higgins Neuk 12 Dec (AMf, RHD).
- GREY WAGTAIL *Motacilla cinerea* (B,w)
 After the high of last year, no birds were recorded on BBS transects.
 Fewer early winter but more late winter records than in 2003. Only five January records (three in 2003): 1 R. Forth on Allan Water confluence-Teith confluence stretch 17 Jan, 1 Milhall Res. 24 Jan, 2 R. Carron on Larbert-B902 Carron stretch & 1 on A9-M876 stretch 25 Jan, 2 R. Devon on Tillicoultry-Dollar stretch. Only two February records (four in 2003): 1 R. Devon on Tillicoultry-Dollar stretch 19 Feb & 2 R. Forth Allan Water confluence-Teith confluence stretch 20 Feb. Only two March records (four in 2003 and 'widespread' in 2002): 1 Kinneil 7 Mar, 2 R. Carron on Carron works-Carron House stretch 22 Mar (DT, MA, DE, AET, AB). More late winter records than in 2003. Five October records (seven in 2003): 2 near Buchlyvie 3 Oct & 1 there 12 Oct, 1 R. Carron on Carron Works-Carron House stretch 17 Oct, 2 on Allan Water, Dunblane 18 Oct, 1 Gartmorn Dam 23 Oct (DAC, AB, RD, AET). Nine November records (four in 2003): Singles Blackness & Allan Water, Dunblane 1 Nov, 4 R. Carron on Larbert-B902 Carron stretch & 4 on A9-M876 stretch 7 Nov; 2 on R. Teith West Row-Doune stretch 19 Nov; singles Netherton Marsh 20 Nov, Cultenhove Dam & Little Denny Res. 23 Nov. 9 December records (1 in 2003): singles Gartmorn Dam 5 Dec; R. Devon on Alva-Tillicoultry stretch 11 Dec; R. Carron on A9-M876 stretch 12 Dec; St. Helen's Loch 15 Dec; L. Menteith 18 Dec; North Third Res. 19 Dec; Allan Water, Dunblane 21 Dec; 3 R. Forth Stirling Bridge-Allan Water confluence 25 Dec & 3 R. Devon on Tillicoultry-Dollar stretch 31 Dec (DAC, PMA, MA, KP, NB, AET, BO, GEL, GE, DE).
- F One Carron Glen 29 May; pr. & 5 juvs. R. Carron near Checkbar roundabout 30 Aug; singles Skinflats 6 Sep & Kinneil 25 Sep (AS, MA, GO, DAC).
- C Ad. & juv. on R. Devon at A91 bridge, Yetts o' Muckhart 8 Jun and ad. & 6 juvs. nearby N of Yetts 15 Jun. 2 in Tillicoultry garden 28 Sep was unusual location (DM, AET).
- S One to 2 birds Killin Apr & Jul, singles Buchlyvie 18 & 27 June (PWS, PMA, RD, DAC).
- PIED WAGTAIL *Motacilla alba* (B, w)
 The BBS figure of 2.1 birds/10 km was the lowest since 1997 and was over half

(-52 %) lower than the long-term mean.

Scarce in winter. Only four January records from three locations (three from one location in 2003): 8 Drip Moss & 2 Skinflats 3 Jan. Singles Gartmorn Dam 11 & 31 Jan. Only two February records (four from three locations in 2003): singles Gartmorn & Tillicoultry Park 22 Feb. No March records (one in 2003 was White Wagtail) (NB, AS, AET).

Only three October records (none in 2003): 26 Skinflats 1 Oct, 360 going to roost Stirling railway station same day, 5 California 31 Oct (GO, RHD, DB). Four November records from three locations (11 from two locations in 2003): 1 Mill Burn, Tillicoultry 6 Nov; up to 4 California 11 Nov; 1 Tait Place, Tillicoultry 23 Nov (AET, LP, DB). Ten December records from seven locations (three in 2003): singles Gartmorn 5, 19 & 25 Dec; W of Tillicoultry 5 Dec; The Rhind, Alloa 12 Dec; Castlebridge, The Forest 24 Dec; Craigrie Fm., Clackmannan 25 Dec; Water treatment works, Dollar 27 Dec with counts of 50 & 71 during December at a supermarket building in Falkirk (AET, MA).

F Up to 5 R. Forth at Blackness Bay early Sep; 31 Skinflats 8 Sep. Also 2 White Wagtails (*M. alba alba*) Skinflats 23 Apr & 5 on 27 Apr (DB, GO,).

C Ad. feeding 2 juvs. Craigrie Fm., Clackmannan 2 Jun. Also White Wagtails (*M. alba alba*) at The Rhind, Alloa 1 May & Cambus Pools 15 May (NB, AET).

S Ten Killin sewage plant 8 Apr; 50 at playing fields, Camelon 30 Aug (PWS, MA).

WAXWING *Bombycilla garrulus* (w)

2004 saw a Waxwing invasion to Britain with birds, sometimes in large flocks, widespread throughout the south-east of the recording area, especially in the conurbations of Stirling, Grangemouth and Falkirk. Flocks break up and join up frequently, as berries get depleted.

F Falkirk from 10 Nov to 17 Dec with maxima of 150+ on west side of town 10 Nov; 200 in St. Mungo's School area 12 Nov rising to 310+ 16 Nov, then 150+ on 17 Nov; 100 at railway station 17 Nov and up to 100 in Callendar Business Park 29 Nov. 21 birds in Laurieston 9 Nov. In Grangemouth from 6 Nov to 13 Dec with maxima of 90 Newlands Rd. 13 Nov, 108 on Dalgrain Rd. 19 Nov rising to 120 there 29 Nov and 430 Grangemouth Docks 13 Dec. 38 Blackness 15 Nov & 15 Dec. 100+ Carron 10 Nov. 40+ Stenhousemuir 19 Nov. 1 Fallin garden 29 Dec (GO, AMf, AB, DOE, MVB, RHD).

S Stirling from 30 Oct to 13 Dec with maxima of 400+ St. Ninians 6 Nov and 280 there 7 Nov, 110 flying over railway station 11 Nov, 100+ flying towards Glasgow Rd. 11 Nov, ca. 100 Royal Infirmary 15 Nov, 100 being chased by Sparrowhawk Torbrex Rd. 16 Nov, 120 between St. Vallery Dv. & Culthenove Rd. 19 Nov. Dunblane 3 to 16 Nov with maxima of ca. 120 on Hillside Avenue 3 Nov, 200+ Argyle Park 4 Nov rising to 255+ the following day, ca. 130 near cathedral 7 Nov, 450 railway station 11 Nov, ca. 100 near supermarket 6 & 12 Nov rising to 500 there 14 Nov, 460 Old Doune Road 14 Nov, 200 Primary School 15 Nov. 18 Denny 26 Nov. 1 Doune 28 Dec (BNS, NB, DOE, MVB, RHD)..

DIPPER *Cinclus cinclus* (B,W)

The high figures of 1997-1999 have not been seen in recent years. The BBS figure of 0.2 birds/10 km is in line with the last two years. It is half that of the long-term mean but absolute numbers are small.

C Two R. Black Devon at Clackmannan 29 Apr, fed Y there 15 May with ad. & juv. at Back Wood 4 Jun. Up to 10 R. Devon on Tillicoultry-Dollar stretch Jan to Mar with up to 7 there Sep to Dec and 1 singing 27 Dec in same locality as in 2003. 1 Balquharn Burn, Alva at 375m asl. 28 May (NB, DE, AET, RC).

S One singing L. Venachar 16 Jan, 6 Allan Water on Dunblane-Ashfield stretch 24 Feb (NB, AW).

- WREN *Troglodytes troglodytes* (B,W)
 The BBS figure of 22.5 is similar to the figures from 2000 onwards and slightly higher (+10 %) than the long-term mean.
 Widespread and common. Under-recorded. No salient records were received.
- DUNNOCK *Accentor modularis* (B,W)
 The BBS figure of 5 birds/10 km was the same as in 2003 and is about average.
 F Albino bird in Carronshore garden Jan to Apr (AB).
 S 12 Drip Moss 3 Jan (NB).
- ROBIN *Erithacus rubecula* (B,W)
 Under-recorded. The BBS score of 15.2 birds/10 km was the highest recorded so far and is a quarter (24 %) above the mean.
 S 23 Drip Moss 3 Jan (NB).
- REDSTART *Phoenicurus phoenicurus* (B)
 Occurs in low numbers on BBS transects. An average of 0.5 birds/10 km were recorded in 2004, only the second year that this species was recorded.
 S Males Killin 28 Apr & 4 Jun; M Bracklin, Callander 22 May; pr. Braes of Doune Lodge 12 Jun; M Ardenoiaig 4 Jul (PWS, DOE).
- WHINCHAT *Saxicola rubetra* (B)
 Occurs in low numbers on BBS transects. The 2004 figure of 1.2 birds/10 km was similar to 2003 (1.1 birds/10 km), which were both much higher than the figures from 1998 to 2002. It was about equal to the long-term mean.
 Arrival in May: 1 Flanders Moss 1 May was on same date as in 2003 (Gartrenich, Aberfoyle) but 25 days earlier than in 2002 (Dollar Glen) was followed by 3 Gartrenich 4 May & 1 there 9 Jun; 1 Braes of Doune, Argaty 11 May (DOE, JM).
 Departure in August: 2 Lecropt 29 Aug was 20 days earlier than in 2003 (Lecropt) (DT).
 S Six prs. Braes of Doune, Lundie 6 Jun (DOE).
- STONECHAT *Saxicola torquata* (b,w)
 The BBS figure of 0.7 birds/10 km was in line with the previous two years, which were much higher than the 1997-2000 figures. It was 75 % higher than the long-term mean but absolute numbers are very small.
 F One Skinflats 1 Oct & M 18 Dec. One Skinflats, R. Carron 14 Nov, 3 there 22 Nov & 1 there 12 Dec. 1 Carron Res. 21 Sep & M Carron Valley 23 Oct. Pr. Black Loch, Limerigg 23 Oct (GO, MVB, AB, NB, DAC, RHD).
 C One singing near Alva Moss 28 May (DM).
 S One Cocksburn Res. 28 Feb. Pr. Sheriffmuir 28 Feb & 29 May with singles there 7 Sep & 29 Oct (M). Pr. Kippen Muir 21 Mar with singles there 30 May & 21 Sep. 3 Gartrenich, Aberfoyle 4 May & 2 there 9 Jun. 2M, 1 F Cringate Moor 5 May. 1 Tom Dubh, Callander 12 May & 12 Jun. 1 L. Arklet 23 May. Pr. & 2 juvs. Braes of Doune, Argaty 3 Jun. M Braes of Doune, Drumloist 10 Jun. Pr. & 4 juvs. at L. Mahaick & at Braes of Doune, Lodge 27 Jun. 2 Killin 5 Jul. Pr. & 3 juvs. Braes of Doune, Lundie 10 Jul. Pr. & 4 juvs. Glen Dochart at Bovain 13 Jul. M L. Coulter 6 Oct, 2 Westhaugh, Stirling 8 Nov, 1 Lecropt 20 Nov (DAC, JM, GO, ES, NB, RD, DOE, PWS, MVB, RD, DT).
- WHEATEAR *Oenanthe oenanthe* (B)
 Occurs in low numbers on BBS transects. The BBS figure of 0.7 birds/10 km was the lowest since 1997 and about half of the long-term mean.
 Arrival: M Kinneil 26 Mar & 4 Apr was 1 day earlier than in 2003 (L. Tay, Killin), 2M & 1F Ballochleam, Kippen 12 Apr, Braes of Doune, Drumloist 16 Apr (AJ, DAC).
 F Migrants: F Skinflats 27 Apr, 2 birds there 10 May, 26 Aug & 7 Sep. 1 Higgins Neuk 22 Aug (GO, DT, AB, JT).

- C Migrants: 3 Park Fm., Clackmannan 7 May (NB).
 S M Inverlochlarig 18 Apr; 5 birds Flanders Moss 1 May; pr. Braes of Doune, Bows 2 May; 4 Cringate Moor 5 May (DT, DOE, GO).
- *RING OUZEL *Turdus torquatus* (b)
 F M Kinneil 26 May, chased away by Magpies (ST).
 S Two Killin 8 Jul, 2 Ashfield 24 Nov (RD).
- BLACKBIRD *Turdus merula* (B,W)
 The BBS figure of 20 birds/10 km was the second lowest since 1997. It continues a downwards trend since 2000 and was 14 % below the long-term mean.
 S 24 Drip Moss 3 Jan was only half the number of 2003 (NB).
- FIELDFARE *Turdus pilaris* (W)
 Spring departure: 50 Dunblane 10 Apr; 50 Braes of Doune, Lodge 18 Apr was 2 days earlier than in 2003 (Ashfield) (MVB, DOE).
 Autumn arrival: 50 Braes of Doune, Lodge 17 Oct was 4 days later than in 2003. This was followed by 5 Dunblane 23 Oct; 50 Balquhidder and 50+ L. Doine 26 Oct; 150 L. Menteith and small flocks of 50-60 birds in the Thornhill area on 31 Oct (DOE, NB).
 F 140 Skinflats 14 Nov (MVB) was largest flock reported.
 C 120+ flying over Cambus Pools 6 Nov (AET).
 S 130 Lecropt 3 Jan. 230 Braes of Doune, Argaty 6 Nov. The Carse of Lecropt continues to attract large flocks. 800 plus 240 W at Carse of Lecropt 6 Nov was similar to the initial 2003 flock there. 400 there 14 Nov dropped to 130 mid-Dec. 149 Blairdummond Moss 21 Dec (MVB, DT, NB).
 2002: 109 Drumbowie 9 Jan; 150 Cromlix, Kinbuck 14 Jan; 160 Milton, Braes of Doune 15 Jan (NB).
- SONG THRUSH *Turdus philomelos* (B,W)
 The BBS figure of 7.5 birds/10 km was the second highest since 1997. It was 21 % higher than the long-term.
 As usual few records in winter: only one January record (compared to 5 in 2003): 1 singing BoA 11 Jan, then song at Skinflats 16 Feb (CJH, AB). Under-recorded.
 F Reported from Kinneil Estate, Bo'ness, Wholeflats, Skinflats, Carron Glen (2) and Wallacebank (AS, AB).
 C Four singing at and around Gartmorn 16 Mar (AET).
 S Reported from Killin, BoA, Dunblane with 3 birds on passage in Dunblane garden 8 Oct (PWS, RD, DK, NB, MVB)
- REDWING *Turdus iliacus* (W)
 Spring departure: 5 Dunblane 10 Apr; 10 Braes of Doune & Lodge 18 Apr was 19 days later than in 2003 (Bo'ness) but only 4 days later than in 2002 (MVB, DOE).
 Autumn arrival: 6 Braes of Doune, Kilbryde 26 Sep was 16 days earlier than in 2003 (Dunblane) and 6 days earlier than in 2002 (Fallin). This was followed by 13 Dunblane 9 Oct with 65 E there 11 Oct, 70 Kippenross 12 Oct, 12 Skinflats 20 Oct and 50 E at BoA 22 Oct (DOE, MVB, GO, CJH).
 F Largest flocks were 43 Bo'ness shore 6 Dec and 32 Bo'ness 16 Dec (AS).
 S Largest flock at traditional site of Lecropt was 140 on 17 Dec. No flocks in excess of 20 birds recorded. 10 BoA garden 11 Dec eating *Cotoneaster* berries was ca. 3 weeks earlier than usual (MVB, CJH).
 2002: 100 Blairdummond 12 Feb (NB).
- MISTLE THRUSH *Turdus viscivorus* (B,W)
 Greatly under-recorded. The BBS figure of 3 birds/10 km was the same as in 2003, both being the highest scores recorded (67 % above the long-term mean).

- F 50 near Bonnyhill Fm., High Bonnybridge 1 Aug (MA).
 S 2002: 12 in new coniferous plantation Cuildochart, Killin 12 Sep (NB).
- *GRASSHOPPER WARBLER *Locustella naevia* (b)
 Occurs in low numbers on BBS transects. The 2004 BBS figure of 0.4 birds/10 km was the highest recorded so far.
 Spring arrival: 2 singing Skinflats 23 Apr were a day earlier than in 2003 (Ashfield) (AB, BNS).
- F Singing Skinflats Apr, thereafter recorded on several dates May, Jul & Sep. Singing Kinneil 3 May & Craigieburn, E of High Bonnybridge (AB, GO, DT, MA, BNS).
- C Singing Gartmorn 15 May & N of Cambus Pools on several dates in Jul (AET).
 S Singing Lecropt 3 & 11 May; Gartrenich, Aberfoyle 4 May; Invertrossachs & L. Ruskie (2) 7 May; Doune 12 Jun; Flanders Moss (2) 5 Jul & Braes of Doune, Lundie 10 Jul (DT, JM, DOE).
- SEDGE WARBLER *Acrocephalus schoenobaenus* (B)
 Occurs in very low numbers on BBS transects. The BBS figure of 1.4 birds/10 km was the second highest recorded and was 17 % above the long-term mean.
 Spring arrival: 3 singing Blairdrummond & 1 Rhind, Alloa 1 May was 14 days later than in 2003 (Skinflats) and 6 days earlier than in 2002 (Blairdrummond). This was followed by singing birds at Thornhill 2 May & Kinneil 3 May and a non-singing bird at Airthrey 5 May. Widespread from 9 May (DOE, NB, DT, MVB).
 Autumn departure: 1 Kinneil 28 Aug was 17 days later than in 2003 (Skinflats) (DT).
 Birds faithful to Skinflats and Cambus Pools sites.
- F Four Skinflats 7 May & 6⁺ singing there 10 May. 2 there 27 Jun were collecting nest material. Nest with 3 imm. there 16 Aug (GO, AB).
- C Four singing Park Fm., Clackmannan 7 May, 3⁺ Cambus Pools 13 May. 6 birds singing Blackdevonmouth wetlands 13 May (NB, CJH).
- S Five singing Blairdrummond; 3 singing Row, Dunblane in oilseed rape & single singing Keir, Dunblane all on 9 May; 1 singing L. Dochart 9 Jun; 1 with juv. Killin Shore 9 Jul (DOE, JT, PWS).
- WHITETHROAT *Sylvia communis* (B)
 The BBS figure of 2.2 birds/10 km was 14 % higher than in 2003 and 10 % higher than the long-term mean.
 Spring arrival: 1 Skinflats 23 Apr was 5 days later than in 2003 (Skinflats). The next arrivals were not until 1 May SW Alloa with 3 singing there 3 May; Braes of Doune, Lodge 2 May (M); 2 Kinneil & 3 Braes of Doune, Argaty 3 May (AB, NB, DOE).
 No departure dates were received.
- F Seven Skinflats 7 May & 8⁺ singing there 10 May (GO, AB).
- GARDEN WARBLER *Sylvia borin* (B)
 Occurs in low numbers on BBS transects and wide fluctuations therefore normal. The BBS figure of 0.4 birds/10 km was twice the long-term mean.
 Spring arrival in May: 1 singing Devon Walk, W of Dollar 5 May was 5 days later than in 2003 (Gartmorn). This was followed by singing birds at Braes of Doune, Drumloist 8 May & Argaty 9 May (DT, DOE).
 Autumn departure: 1 Blairdrummond GPs 29 Aug was 24 days earlier than in 2002 (Skinflats) (MVB).
- S Birds singing Hermitage Wood, BoA (2) 29 May; Dykehead, L. Menteith 30 May & L. Lubhair 9 Jun (JT).
- BLACKCAP *Sylvia atricapilla* (B)
 The BBS figure of 1.7 birds/10 km was the second highest since 1997 and was

21 % higher than the long-term mean, though absolute numbers are small.

Winter records: The overwintering M from Dec 2002 stayed in Springwood Avenue, Stirling 1 Jan to 29 Feb feeding mainly on peanut fat cake and sunflower hearts and being very aggressive towards other birds. It was joined by a second M 1 Jan to 10 Feb. Two M there 2 to 26 Mar. M Alexander Drive, BoA 2 & 25 Jan. Also bird in Bo'ness garden 8 Feb to 11 Mar (where also present in winters of 2002 and 2003) (CJM, MVB, AS).

Spring arrival: one singing 9 Apr Falkirk was 8 days earlier than in 2003 (Alva) but 3 days later than in 2002 (Camelon). This was followed by M Viewforth, Stirling 14 Apr and singing birds BoA 25 Apr and Parkmill, Alloa 26 Apr (MA, DT, CJH, NB).

Autumn departure: last report was 1 Blairdrummond GPs 29 Aug, which was 19 days earlier than in 2003 (Lecropt) (MVB).

F M Skinflats 1 May and singing there 10 May with at least 2 pairs present 27 June (species present there for 4 years in a row). 2 Carron Glen 29 May (GO, AB, AS).

S Singles L. Menteith 1 May, Braes of Doune, Argaty 3 May; singing Royal Infirmary, Stirling 7 May; Cambusmore 20 May (DOE, AB, PWS).

WOOD WARBLER *Phylloscopus sibilatrix* (B)

Under-recorded; only three records received. Occurs in very low numbers on BBS transects. 2004 figure of 0.1 birds/10 km was average.

C Singing Castleton Fm., Dollar 11 May (DT). This is the last remaining site in Clackmannanshire.

S One singing L. Dochart 9 Jun; 1 Old Doune Rd., Dunblane 5 Jul (JT, RiD).

CHIFFCHAFF *Phylloscopus collybita* (B)

BBS figure of 2.2 birds/10 km was by far the highest since 1997 and was almost three times the long-term mean.

Spring arrival: 1 singing L. Menteith 23 Mar was 5 days later than in 2003 (Ashfield). This was followed by 1 singing Champany, Blackness 29 Mar and 3 Plean CP 31 Mar rising to 4 there by 12 Apr (DT, AMf, AB).

Autumn departure: singles Carron Res. 21 Sep, Dunblane garden 22 Sep, Blackness 26 Sep (DAC, MVB, AB).

F Three Carron Glen 29 May (AS).

C One singing Cambus Pools 25 Apr (CJH).

S Reported from Laignhills, Dunblane; Pathfoot, Airthrey; Blairdrummond; Braes of Doune, Argaty & Lodge; Royal Infirmary, Stirling and Gartmore (MVB, DOE, AB, JT).

WILLOW WARBLER *Phylloscopus trochilus* (B)

The 2004 BBS figure of 14 birds/10 km was similar to 2003 (14.9) and the lowest since 1997. Both figures were about a quarter lower than the long-term mean.

Spring arrival in April was late: singles Lecropt & Blairdrummond 16 Apr was 10 days later than in 2003 (Carronshore-Carron Banks). This was followed by 8 Laignhills, Dunblane & 1 Buchlyvie 18 Apr; 1 Carronshore 21 Apr; 3 singing Cambus & 2 singing L. Menteith 22 Apr; 2 Skinflats 23 Apr & 1 singing Killin Shore 28 Apr (DT, DAC, AB, DOE, MVB, NB, RAB, PWS).

S Four singing L. Lubhair 9 Jun (JT).

GOLDCREST *Regulus regulus* (B,W)

Under-recorded. No notable records were received. The BBS figure of 9.9 birds/10 km was the highest recorded so far and continues an upward trend since 1999. Numbers were just over three quarters above the long-term mean.

SPOTTED FLYCATCHER *Muscicapa striata* (B)

BBS figures are in line with those from previous years, bar 2002 when an exceptional high of 1.2 birds/10 km was recorded.

Remains scarce with 18 reports received. Spring arrival: 1 Killin Shore 12 May was 2 days earlier than in 2003 (Kinlochard) and 8 days earlier than in 2002 (Strathyre). This was followed by 2 L. Voil 13 May and 1 near Buchlyvie 18 May (PWS, DJC, DAC).

Autumn departure: 1 Skinflats 1 Sep & 1 R. Carron at Carron 20 Sep were probably passage bird (DT, AB).

- F Pr. & 4 Y. (one died) in Swallow nest Champany, Blackness 4 Jul. Ad feeding 5 juvs. Greenhill, High Bonnybridge 22 Aug (AMf, MA).
- C Two Dollar Glen 25 May; 1 Brucefield, 5 of Forestmill 27 May. 2 ads. carrying food Clackmannan 17 Jun. Ad. & 2 imms. Gartmorn 22 Aug (MB, NB, AET).
- S Breeding season: prs. reported from Braes of Doune, Argaty & Lodge, Adeonaig (2 prs.) & Lecropt where pr. & 2 juvs. present 12 Jul. Singles Kippen Muir, near Buchlyvie, L. Voil, Killin & Blairdrummond GPs (DOE, DAC, PWS, MVB).
- *PIED FLYCATCHER *Ficedula hypoleuca* (b)
- S M Braeval, Aberfoyle 3 Jul; 2 Killin 8 Jul (DOE, GPs, RHD).
- LONG-TAILED TIT *Aegithalos caudatus* (B,W)
- The 2004 BBS figures was about four times that of 2003 but was equal to the long-term mean.
- F Flocks of 15 Skinflats 14 Aug & 13 there 12 Oct, 12 R. Forth at Blackness Bay 7 Sep, 12 Bo'ness garden 6 Oct rising to 17 on 25 Nov, 12 California 11 Nov, 15 Kinneil 12 Dec (AB, GO, LP, AS, MVB).
- C Families of 5+ & 3+ Gartmorn 31 May. 34 R. Devon at Cambus 6 Nov (AET).
- S Flocks of 16 L. Watston 25 Jan, 20 Plean CP 2 Nov, 16 R. Teith at Doune (DK, AB). 2002: 10 Killin 17 Nov, 19 L. Venachar 5 Dec & 11 Ardcarnraig, L. Doine 17 Dec (NB).
- COAL TIT *Parus ater* (B,W)
- Widespread but under-recorded. The BBS figure of 6 birds/10 km was slightly below average (-5 %).
- BLUE TIT *Parus caeruleus* (B,W)
- Under-recorded. The 2004 BBS figure of 18.8 birds/10 km was the second highest recorded and was about 15 % higher than the long-term mean.
- F Brood of 5+ fledged from nest box Balure Crescent, Fallin 8 Jun (RHD).
- S 30 Drip Moss 3 Jan was 17 less than in 2003. 1st fledgling BoA garden 8 Jun was 3 days earlier than in 2003 (NB, CJH).
- GREAT TIT *Parus major* (B,W)
- Under-recorded. The 2004 BBS figure of 7 birds/10 km was very slightly above the long-term mean (+3 %).
- C Nested in Beech tree Tait Place, Tillicoultry 6 Jun (AET).
- S Nine Drip Moss 3 Jan (NB).
- TREECREEPER *Certhia familiaris* (B,W)
- Under-recorded. Recorded in very small numbers on BBS transects. The 2004 figure of 0.4 birds/10 km was about average.
- S Pr. feeding Y Braes of Doune, Lodge 2 Jun & pr. with Y there at Buchany 19 Jun (DOE).
- JAY *Garrulus glandarius* (B,W)
- Recorded in very small numbers on BBS transects. The 2004 figure of 0.4 birds/10 km was average.
- F One Dunmore Woods 11 Nov (AB).
- C Singles Tait Place, Tillicoultry 27 Mar & 21 Jun; Keilarsbrae, Alloa 5 May; Gartmorn 16 Nov & 25 Dec there in Grassmainston Strip; Tullibody 19 Nov (AET, NB).
- S Largest flocks were 3 Plean CP 3 Apr with 1 there 2 Nov & 2 on 25 Dec; 9 Croftchois, G. Dochart 26 Oct & 4 there 26 Nov; 3 Callander Meadows 26 Oct (1

there 22 Sep); 3 Gart, Callander 30 Oct & 4 Stronvar, L. Voil 17 Nov. The only records from the breeding season were singles at Tom Dubh 10 Jun; Buchlyvie 27 Jun & L. Voil 28 Jun. Otherwise singles or pairs reported L. Mahaick 26 Jan; L. Rusky 17 Feb with 2 there 24 Sep & 1 on 29 Nov; Buchlyvie 12 Sep & 3 Nov; Carron Res. 21 Sep; Vale of Coustry 29 Sep; L. Chon 23 Oct; Milton, L. Ard 29 Oct; Balquhadder 7 Dec (AB, NB, DAC, JT, ES, DAC, DJC).

MAGPIE *Pica pica* (B,W)

The 2004 BBS figure of 6.3 birds/10 km was the highest recorded since 1997 and was 24 % higher than the long-term mean.

No records received from the large Airthrey roost. Continues to be very scarce north-east of Dunblane. Abundant around Stirling but is not usually as frequent in the west. Large groups now widespread in Falkirk

F 15 Kinneil 28 Nov, 15 Bo'ness shore 4 Dec (DT, AS).

C 16 Pond Wood, Clackmannan 25 Dec (AET).

S First recorded in Dunblane garden 1996; now present there 75 % of weeks. Two Tom Dubh 2 Jun; 10 Killin 5 Jun; 3 Braes of Doune, Severie 3 Oct was first in 10 years of WeBS visits; 10 Allan Water, Dunblane 1 Nov (NB, ES, PMA).

JACKDAW *Corvus monedula* (B,W)

Under-recorded. The BBS figure of 23.1 birds/10 km was slightly lower than in 2003 (-2 %) and similarly lower than the long-term mean (-2 %).

F Four Skinflats 6 Sep is unusual for location (GO).

S 35 Plean CP 12 Feb with 50 there 3 Apr & 30 on 6 Nov. 150 in dusk roost flight BoA 18 Mar. 1 Victoria Pl., Stirling 13 Aug was semi-albino with whitish rump and white flecks and patches on remainder of body (AB, CJH, DT).

ROOK *Corvus frugilegus* (B,W)

The 2004 BBS figure was slightly higher than the 2003 figure (+9 %) but still only about half (52 %) the long-term mean.

Systematic counts of known rookeries (e.g. BoA, Gartmorn, Forth & Clyde Canal, L. Menteith, etc.) needed.

S Small rookery at Black Boy, Stirling persists with five nests, of which two survived. Roost flights S in BoA as early as 26 May (DT, CJH).

CARRION CROW *Corvus corone* (B,W)

The 2004 BBS figure of 33.6 birds/10 km was about twice that of 2003 but about the same as the long-term mean (+3 %).

C Nest in Elder at Park Fm., Clackmannan 7 May. 150 Balquharn Burn above Alva 1 Jun (NB, RC).

*HOODED CROW *Corvus cornix* (b, w)

Occurs in very low numbers on BBS transects. The 2004 figure of 0.2 birds/10 km was average.

More records are needed to determine true status in NW of recording area.

S Reported from usual localities with 1-2 birds L. Dochart Jan, Jul & Oct to Dec - a bird there on 26 Nov was paired with a Carrion Crow; 1-2 birds L. Voil 13 May, 28 Jun & 7 Dec (hybrid); single at Killin 5 and 8 Jul & 22 Sep; 1-2 birds at Glen Dochart 22 Sep & 26 Oct; single E of Aberfoyle 8 Nov. Birds at Allan Water, Dunblane 1 Nov & Kinbuck 26 Nov were outside usual range (RD, NB, JT, DAC, DJC).

RAVEN *Corvus corax* (B,W)

Occurs in very low numbers on BBS transects. The 2004 BBS figure of 0.2 birds/10 km was similar to previous years, except 2003, when a high of 0.12 birds/10 km was recorded.

Upper Forth Raptor Study Group; checked 16 territories: 15 had pairs, 7 of which were successful and 6 of which raised 18 Y; 2 prs. were presumed

unsuccessful and the fate of 6 prs. was unknown. This is very slightly up on 2003.

The increasing number of reports from the Callander-Doune-Dunblane area thus do not seem to indicate that the species is spreading the breeding range south-east. Will colonisation occur in future years?

- F One Champany, Blackness 29 Jan (AMf).
 C Two over Lady Ann's Wood, Tillicoultry 25 Oct drifted E. Pr. above Mill Glen, Tillicoultry 25 Dec (AET, MA).
 S Few reports from core area: 1 L. Lubnaig 20 Feb, 1 L. Voil 28 Jun & 1 L. Lubhair 11 Dec. Large flocks continue to be present at Braes of Doune with 70 roosting at the Lodge 11 Jan with 10 there 13 Mar & pr. with fledged Y 16 Jun, 20 at Argaty 8 Apr, 32 Drumloist 17 Apr. Several reports from Dunblane Feb to Apr & Sep to Nov with 4 birds over Newton Crescent 9 Apr & 8 birds there 8 Oct may relate to dispersing birds from the Doune roost. 2 L. Menteith loitering around heronry 22 Apr, 1 Gart GPs 30 Aug & 1 Lecropt 11 Dec may do likewise. Nest with 2 large Y Sheriffmuir 3 May. 2 Cringate Moor 5 May (NB, DJC, DOE, MVB, RAB, DT, GO).
 2003: 80 at roost Braes of Doune, L. Mahaick 15 Feb; 35 Braes of Doune, Lodge 3 May & 50 at roost there 7 Nov (DOE).
 2002: One L. Mahaick 13 Feb; 2 Cromlix, Kinbuck 12 May (NB, DP).

STARLING *Sturnus vulgaris* (B,W)

Greatly under-reported. The BBS figure of 45.9 birds/10 km was similar to the comparatively low figures of 2002 and 2003. It remains 23 % below the long-term mean.

- F/C 350 Kincardine Bridge roost 10 Nov (CJH).
 C Ca. 150 feeding on Alloa landfill site 26 May (NB).
 S 600 Braes of Doune, Dalbrack 15 Feb (DOE).
 HOUSE SPARROW *Passer domesticus* (B,W)

Under-recorded. The BBS figure of 15.3 birds/10 km was close to the long-term mean (+2 %).

- F 16 Bo'ness garden 16 Jun; up to 15 R. Forth at Bo'ness and Blackness Bay shores late Aug/early Sep. Up to 15 California late Oct to mid-Nov. An almost completely albino bird with remnant brown areas (e.g. on wing and ear coverts) in garden at Frankerton, Denny 28 Aug to 18 Nov was presumed to be this species. Fed on nuts, etc. - photo available (AS, LP, DB, PB).
 S 126 Drip Moss 3 Jan - 200 there in 2003 and 150 in 2002. 29 Killin 8 Jul. 20 Braes of Doune, Lundie & 35 there at Argaty 15 Jul. 29 Kinbuck woodland 28 Dec (NB, NDC, DOE).

TREE SPARROW *Passer montanus* (B,W)

Occurs in very low numbers on BBS transects. The BBS figure of 0.2 birds/10 km was average.

Winter numbers in core area of Lecropt-Thornhill were significantly lower than in previous two years.

- F Four Avonbridge 9 May. Five Skinflats 7 May, 12 there 17 Jul, 8 on 20 Jul & 18 on 23 Aug. Two South Alloa 3 Oct, 2 Higgins Neuk 30 Oct, 4 Blackness Castle 19 Dec (AB, MA, RS, GO, RHD).
 C Reported from a larger list of sites than usual with several reports from in and around Clackmannan village: 6 Cambus 21 Feb. 2 Hallpark, Alloa 20 Apr. Two Craigie Fm., Clackmannan 23 Apr with pr. there feeding Y & pr. entering nest hole in Ash tree 2 Jun. Singles The Glebe, Clackmannan Hawking insects 28 Apr and Kirkbrae, Clackmannan 7 May. 4 ads. entering two nest holes in sandstone wall of Carsebridge whisky depot 27 May. One Clackmannan Tower 2 Jun,

4 Hilton Fm., Clackmannan included an ad. carrying food 4 Jun. Five Kennetpans 4 Dec (DAC, NB, MVB).

2002: 2 in spring cereal Alva 26 May (NB).

- S 20 Thornhill 11 Jan. At least 6 prs. in nest boxes raised a minimum of 20 Y 7 Jun. Recorded Lecropt May, Jul, Sep & Nov with maxima of 13 on 12 Jul, at least 24 on 6 Nov & 16 on 28 Nov. Elsewhere 12 Drip Moss 3 Jan with 35 there 29 Sep. 2 prs. feeding Y Alton, Fm., Fallin 16 May with 8 ads. there 30 May. 20 Killin 7 Jul. Ad. with Y Balure, Crescent, Fallin 16 Jun. Four Kippenrait, Dunblane 12 Oct, 8 Kippen 28 Oct & 8 Westhaugh, Stirling 8 Nov (DOE, DJC, NB, DT, MVB, HS, RHD).

CHAFFINCH *Fringilla coelebs* (B,W)

The 2004 BBS figure of 40.7 birds/10 km reversed a downward trend since 1999 and was just below average (-0.8 %).

- C Singing Tait Place, Tillicoultry 20 Jan (AH).
S 125 Lecropt 3 Jan with 150 there 6 Nov; 180 Drip Moss 3 Jan; 400 Blairdrummond 11 Jan; 400 Braes of Doune, Argaty 21 Jan with 50 there 14 Mar; 250 Kippenrait, Dunblane 25 Jan & 100 there 7 Dec. 35 Ochiltree, Dunblane garden 14 Feb. Ca. 300 Malling, L Menteith 29 Nov. 180 Waterside Fm., Cromlix 4 Dec; 230 Stonehill Fm., Dunblane 7 Dec (MVB, NB, DOE).

*BRAMBLING *Fringilla montifringilla* (W)

- F 17 Stirling Rd., Falkirk 9 Apr (MA).
C One singing Woodland Park, Alva 1 May - present there also in 2002 (RHD).
S Singles in gardens of Ochiltree, Dunblane on several days 1 to 24 Jan and Newton Crescent, Dunblane 31 Jan. A ringed bird Buchlyvie 23 Feb; single Sherrifmuir 28 Feb (NB, MVB, DAC).

GREENFINCH *Carduelis chloris* (B,W)

Under-recorded. The BBS figure of 6.5 birds/10 km was 6 % below the long-term mean.

- S 300 Kippenrait, Dunblane 12 Oct and 90 there 17 Oct; 200 Stonehill Fm., Dunblane 17 Oct. 23 Strathyre garden 24 Dec (MVB, DJC).

GOLDFINCH *Carduelis carduelis* (B,W)

The BBS figure of 4 birds/10 km was the highest since 1997 and follows an increasing trend since 1998. It was 48 % above the long-term mean.

Unlike in previous years, no significant flocks from the Doune-Dunblane area.

- F 30 Kincardine Br. 22 Feb; 30 Dorrator Fm., Camelon 30 Aug; 25 Kinneil 31 Aug; 40 Skinflats 11 Sep; 160 Higgins Neuk 16 Oct; 60 R. Carron, Langleas woodland regeneration 12 Dec (MVB, MA, DT, AB).
S 58 Braeface, Banknock (NB).

SISKIN *Carduelis spinus* (B,W)

The BBS highs of 1997 and 1998 have not been seen since and the 2004 figure of 1.7 birds/10 km was 55 % below the long-term mean, though absolute numbers are comparatively small.

- S 32 The Meadows, Callander 16 Jan; 35 Newton Crescent, Dunblane 9 Apr; 70-100 Brig o' Turk 23 Nov; 80 Strathyre, 70+ Killin & 20 Lochan Buidhe, S of Strathyre all on 26 Oct; ca. 40 Aberfoyle 29 Oct; 44 L. Lubnaig 7 Dec; 15 Ochiltree, Dunblane 9 Dec (NB, MVB, DJC).

2002: 60 Castle Business Pk., Stirling 15 Jan; 50 L. Venachar 19 Nov (NB).

LINNET *Carduelis cannabina* (B,W)

The 2004 BBS figure of 2.3 birds/10 km was the second lowest since 1997. It was well up on 2003 (+53 %) but remains 21 % below the long-term mean.

There continue to be fewer birds than previously in the Doune area but large flocks were in the Dunblane area. No data were received from the Carse of

- Lecropt which previously also held large flocks.
- F 158 R. Carron at Carron Works 2 Jan; 60 Skinflats 22 Jan; 80 Higgins Neuk 30 Oct (MA, RHD).
- C Pr. Craigrie Fm., Clackmannan building nest 2 Jun. 55 Kennetpans 4 Dec (NB, MVB).
- S 200 Braes of Doune Argaty 10 Jan, 150 there 26 Sep & 100 there in wild bird cover/game crop 21 Dec; 220 Kippenrait, Dunblane 9 Oct & 600 there 12 Oct; 600 Stonehill Fm., Dunblane 17 Oct (DOE, DJC, MVB).
- TWITE *Carduelis flavirostris* (b,W)
Occurs in very low numbers on BBS transects (0.2 birds/10 km).
- F 90 Kinneil 2 Jan, 70 there 7 Jan, 50 on 10 Jan & 75 on 25 Jan & 4 on 12 Dec; 26 on saltmarsh at Skinflats 13 Feb & 70 there 18 Dec. 16 West Grangemouth 17 Jan. 17 Dunmore & 6 Higgins Neuk 16 Oct, 35 there 30 Oct & 2 on 12 Dec (CJH, RS, MVB, DT, AS, AB, RHD).
- S Six Braes of Doune, Argaty 10 Jan, 3 there 26 Sep & 4 on 2 Oct. 16 Lecropt 18 Jan, 35 Kinbuck 22 Apr. 15 Stonehill Fm., Dunblane 17 Oct and 570 there 7 Dec (DOE, MVB).
- LESSER REDPOLL *Carduelis cabaret* (b,W)
Occurs in very low numbers on BBS transects (0.4 birds/10 km).
- F 25 Kinneil 2 Jan. 5 R. Carron in Langleas woodland regeneration project 12 Dec (MVB, AB).
- S 15 Lecropt 20 Feb (DT).
- COMMON CROSSBILL *Loxia curvirostra* (b,W)
Occurs in very low numbers on BBS transects (0.2 birds/10 km). Only five reports received, all of very small flocks.
- S Two Braes of Doune, Drumloist 18 Jun. 2 prs. with broods L. Ard 3 Jul was unusual date. 2 Achray Forest 12 Sep. 8 Carron Valley included a pr. feeding Y 28 Oct & F Carron Res. 12 Dec (DOE, RHD, DAC).
- BULLFINCH *Pyrrhula pyrrhula* (B,W)
Occurs in low numbers on BBS transects. The 2004 figure of 0.7 birds/10 km was about average.
- F Four Dunmore 11 Nov (AB).
- C Two Clackmannan 10 May. 4 M Kennetpans 4 Dec (NB, MVB).
- S Pr. with brood of 3 Braes of Doune, Argaty 19 Jun. Pr. with brood of 3 Redknock, Port of Menteith 4 Jul. Elsewhere in breeding season reported from Doune Ponds; Gartenich, Aberfoyle & Killin. Five Cromlix 4 Dec. Four L. Dochart 11 Dec. Two M & 2F Doune 28 Dec were Northern Bulfinches (*P.p. pyrrhula*) (DOE, JM, PWS, MVB, NB).
- *SNOW BUNTING *Plectrophenax nivalis* (W)
- F One Springfield Cottages, Skinflats 2 Apr (BNS).
- C 5 W Ben Ever 25 Dec - where 58 present in Dec 2002 (MA).
- S 2003: 20 Wood Hill 20 Dec (JG).
- YELLOWHAMMER *Emberiza citrinella* (B,W)
The BBS figure of 3 birds/10 km was 12 % below the long-term mean.
- F 42 R. Carron at Camelon Cemetery 4 Jan. 15 Skinflats 22 Jan. 8 singing Skinflats 10 Jul. 18 Higgins Neuk 18 Oct with 40 there 30 Oct (MA, AB, JT, MVB, RHD).
- C Ad. feeding juv. Craigrie Fm., Clackmannan 3 Jun (NB).
- S 26 Drip Moss 3 Jan. 3 prs. Flanders Moss 1 May. 40 Thornhill 11 Jan; 24 Lecropt 6 Nov (NB, DOE, MVB).
- REED BUNTING *Emberiza schoeniclus* (B,W)
The series of high figures since 2002 continues. The 2004 figure of 2.6 birds/

- 10 km was 30 % above the long-term mean.
- F 13 Brackenlees, Powfoulis 3 Jan. 10⁺ Kinneil 29 Feb, 11 there 10 Mar. Four singing Skinflats 10 Jul (AS, DT, MVB, JT).
- C Six Gartmorn in (pre-)roost on island 30 Mar (AET).
- S 14 Bandedeath 14 Feb. 10 Lecropt 27 Feb, 14 there 6 Nov & 11 on 20 Nov. 12 Sherrifmuir 28 Feb. 40 Westhaugh, Stirling 23 Dec. 40⁺ Biggins Wood, Dunblane 28 Dec (DT, MVB, DAC, RHD, HS, HW).

ESCAPED SPECIES

SNOW GOOSE *Anser caerulescens*

- S White morph foraging among 330+ Pink-feet at Gogar House, Blairlogie 16 Feb, Manor Powis 17-19 & 21 Feb. Dark morph N. Third Res. 23 Sep (AET, RS, BO).

BARNACLE GOOSE *Branta leucopsis*

- S One N. Third Res. 23 Sep (BO).

EGYPTIAN GOOSE *Alopochen aegyptiacus*

This is probably the bird that has been on the Forth since last year (first sighting 22 Jan 2003 at Skinflats). It again seems to have stayed around for the whole year.

- C Longcarse, Alloa 19-21 & 22-24 Jan. Alloa Inches 25 Jan. Longcarse, Alloa 27 & 29 Feb. West of Cambus Pools 18 Apr. Black Devonmouth 28 Jun. Flew over R. Forth at The Rhind with Greylag flock 16 Oct. Alloa & Tullibody Inches 12 Dec. Foraging in mixed Greylag & Pinkfeet flock in improved fields at Haugh Cottage, Cambus 24 Dec (AET, RS, RHD, CJH).

MANDARIN DUCK *Aix galericulata*

- S Pr. Plean CP 31 Mar may have escaped from Torwood (DT).

WOOD DUCK *Aix sponsa*

Male; seems to have stayed all year round.

- S Castle Business Pk., Stirling 8 & 13 Mar, 1 Apr, 7 Aug in eclipse plumage, 15 Sep, 23 Oct, 2 Nov, 14 & 15 Dec (NB, AET, RS, BNS).

SOUTHERN POCHARD *Netta erythrophthalma*

- F F Skinflats 25 Jun; 1 Kinneil 11 Jul (RS)

RED-LEGGED PARTRIDGE *Alectoris rufa*

- S Eight Lochend, L. Menteith 23 Oct (JT).

ALLOA INCH: THE MUD BANK IN THE FORTH THAT BECAME AN INHABITED ISLAND

Roy Sexton and Edward Stewart

With invaluable help from Margaret MacGregor and her family, Archie Russell, John Harrison, John Easton, Richard Tipping and Steven Blow.

Islands like Alloa Inch which are inhabited by single families are rare and life on them produces its own unique challenges. The purpose of this account is not only to document the conversion of a mudbank into a farmed island but to record the recollections of some of the last occupants.

Introduction

Between Cambus and Alloa there were originally three islands in the River Forth. Alloa Inch is the biggest of these and is located just upstream of Alloa glass works opposite South Alloa village. Historically it was called Carsie or Kersie island (or the Gaelic inch), then Longcarse or Longkerse island before its current name was adopted. It is surrounded on both sides by the 3-400 yd wide river Forth and although it can be reached by boat at high tide, at low tide the sides of the river channels become impenetrable tracts of soft mud making access extremely difficult. Originally the Inch was 42.5 acres of grazed salt marsh which was submerged to a depth of 3-6 feet by the 20 foot spring tides. The construction in 1806 of a 1½ mile long 6-9 ft encircling embankment converted 77 acres into rich arable land. This enterprise was not without its difficulties and the river overflowed the defences within two months of construction. Once the banks were secured a farm house and steadings were built and the island was farmed continuously for 170 years. Eventually problems with the water supply from the mainland and the collapse of a stretch of bank in 1983 led to the abandonment of the farm. In 1996 Scottish Wildlife Trust purchased the island as a salt marsh Nature Reserve.

From 1700-1800

General information about the history of the island can be gleaned by consulting early maps (<http://www.nls.uk/digitallibrary/map/>). The first record of the Alloa Inch is on Pont's map of 1580-90 (Figure 1), which shows a small island in the Forth adjacent to Kersie (Carsey) farm. The whole Forth looks very different and it is difficult to unravel surveying inaccuracies from real change. John Adair's 1681 map of Clackmannanshire was probably the first in Scotland to use triangulation. It shows a bigger and more recognisable "Carsie island" (Figure 2) located between the farms of Longcarse and Carsie on opposite banks. Two smaller islands are shown upstream, Tullibody Inch on the east side and an un-named Inch on the Throsk shore. On William Roy's military map of 1745 (Figure 3), the island is located in its current position and is shaded to indicate it was unploughed salt marsh pasture surrounded by a muddy shore.

The ferry just downstream of the Inch probably provided access to the island. Little change is visible on Stobie's plan of 1783 but by Grassom's 1817 survey (Figure 4) Throsk Inch has disappeared and there is a house on Alloa Inch. During the intervening thirty years massive construction works were undertaken to prevent all three mud islands flooding, turning them into valuable agricultural land. Although there was little change on the island during the next century the 1927 OS map (Figure 5) reveals the development of Alloa town and the construction of railways both to South Alloa and between Throsk and the Longcarse peninsula over the first Forth Railway bridge.

Much of the Alloa bank including Longcarse Farm and the island were parts of the extensive estates of the Earls of Mar. When John 6th Earl of Mar was declared a traitor for his role in leading the 1715 Jacobite rebellion, his title and estates were forfeited and administered by Commissioners appointed by Act of Parliament to "*Inquire into the Estates of Traitors*". This involved documenting the tenants' holdings and collecting their rent. Amongst these records can be found:

"James Mudie in Longkerse possesses the roup of Longkerse consisting of eightie six ackers or thereby all arable kerse clay ground and the Inch of Longkerse for pasturage consisting of eighteen ackers that is always overflowen and covered each spring tyde". The attached Longcarse farm was obviously very productive since the annual rent was: *"Two hundred pounds Scots, eleven bolls (=140 lb) of wheat, thirtein bolls of bear (barley), twentie four bolls of best meall, twelve bolls of beans, four bolls of oats, two lippies (1¾lb) of mustard, three goose, twelve capons, twelve hens, ten ducks, twelve turses of straw"*. The tack passed to James son William Mudie *"procreated betwixt him and the deceased Christian Masterton"*.

When the forfeited estates were offered for sale in 1730 the Crown did not resist John Erskine's brother Lord Grange and David Erskine of Dun purchasing them. The Alloa estate including the island was then entailed on the heirs of the 6th Earl's daughter Lady Frances Erskine. She married her cousin James Erskine and their son John Francis Erskine took over the administration of the estate.

Longkerse farm and the island were leased between 1774 and 1804 by John Guild of Boll farm at Alva. The annual rental for the Longkerse Inch was £12 together with "kainfowls" (kain = rent) and that of Longkerse farm £90 pa suggesting the island had some agricultural value.

In the Old Statistical Account of 1791 we are fortunate to have a good description of the Inches *"After passing the ferry of Craig Ward, the river becomes narrower and there are some beautiful islands, which are called Inches. These furnish excellent pasture for cattle during the summer and are esteemed medicinal for such as are weakly or sick. They are a gentle kind of salt marsh and are entirely covered at spring tides. These islands are frequented by great quantities of waterfowl, viz. wild ducks, teals, widgeons, gulls etc."*

Fishing was also undertaken from the island: *"Upon the point of these Inches,*

they erect what are called yares, a sort of scaffold projecting into the water; upon which they build little huts to protect them from the weather. From these scaffolds they let down, at certain times of the tide, their nets, and are often very successful at taking the smaller fish such as herrings, garvoies or sprats, sparlings or smelts, whittings, haddocks, sea trouts and eels". This was still happening a century later when three sparling fishermen were fined (£5) or imprisoned for 21 days for taking sea trout in their nets on the Inch.

In a 1795 *General View of the Agriculture of the County of Clackmannan* John Francis Erskine discusses the agricultural value of the three tidal islands between Cambus and Alloa. He notes that the smallest of these (Tullibody Inch) had just been surrounded by a sea dyke by Mr Haig who leased the adjacent Orchard Farm. Erskine seems rather cautious about the venture questioning whether the bank would improve the pasture enough to feed extra cattle necessary to justify the expense; however fifteen years later the rental had increased three fold and it was seen as a great success.

From 1800-1900: Embankment, flooding and law suites

During the latter part of the 18th century there had been a great deal of reclamation work of the saltmarshes along the banks of the Forth. The rich alluvial soils generated were some of the best in Scotland and it was said that *"A crook o' the Forth Is worth an earldom o' the North"*. The Erskines had some favourable experience of the embanking process. In 1776 they recovered 55 acres of flooded salt-grass on their riverside land at Ferrytown in Clackmannan by constructing a 1320 yd long bank which was 10 feet in height with a 40 ft base. *"Although the outlay was considerable (£805) the richness of the resulting farmland gave a good return on the investment yielding 7 % pa interest"*.

In June 1800 John Francis Erskine had Longcarse Island surveyed by John Bell. The shoreline was a mile and a half (2510 yds) long and the area within it was 57 acres. He found the upstream end of the Inch was 3 ft 2 in below spring tide and the downstream end 2 ft 5½ inches lower. Bell's survey was clearly done to investigate the feasibility of surrounding the Inch with embankments, turning the central area into very valuable agricultural land. This was a formidable undertaking since the river at Alloa is subject to 22 ft spring tides together with high flows and frequent flood surges.

The man who was to construct an embankment round the Longcarse island was Robert Drummond, a farmer from Nether Friarton near Perth. His tenancy included the river frontage and the local island in the Tay. He was a corn and lime merchant with a share in three sloops which traded lime from Sunderland with local grain.

We are not sure how Drummond became involved with Alloa Inch but in 1806 he entered into an agreement with John Francis Erskine that he would embank the island at his own expense which he estimated to be £750. In return he negotiated a long 21 year lease on what he hoped would be valuable reclaimed arable land. The terms were set out in a Tack in 1810 some time after

he occupied the island. This would seem a rather expensive undertaking to recover 77 acres of farmland but good carse land could yield 10 bolls of wheat per acre and this would have sold at Falkirk for £1-4s-0d per boll in 1793. In the inventory of his assets compiled after his death the standing crop on the island was valued at £730.

John Francis Erskine appears to have had a role in planning the embankment and is actually credited with the operation in the 1814 Clackmannanshire Agricultural Report. He stipulated the height and slopes of the banks. Drummond was keen to get the sea dykes in place so he could start to recover his costs by planting crops in the first year. In 1806 he advertised for contractors to complete the project and engaged a Perth based road building company run by James and Charles McDonald and Charles Cameron (McDonalds and Cameron). In the missive dated 18th March 1806 the contractors stated:

"We hereby agree to embank the Inch or Island of Long Carse as has been described by you (i.e. Robert Drummond); that is to say to make a bank six feet high on the south and east side and to carry the level round which will be about nine feet on the north and west side; the bank to slope three feet to one of the height on the outside and turfed with a thick seal as can be conveniently cut; the slope on the inside to be about one foot for every four feet of the height, and the bank to be three feet broad at the top; but should you think proper to run the bank any higher on the top on the same slope we agree to do it, if you give us instructions before we finish said bank".

There was also provision in the missive for an internal drainage ditch running round the inside of the bank and sluices to allow the rainwater out at low tide. This whole operation had to be completed with extraordinary speed since half-finished banks could so easily be washed away, particularly before they were covered in a protective sward. McDonalds and Cameron agreed to complete the contract by October 1st 1806. In April, Drummond and his operatives pegged out the position of the base of the banks, moving them slightly seawards from Bell's suggested line to gain more ground inside.

Unfortunately, things did not run smoothly for Robert Drummond and from the mass of litigation that ensued we can discern some details of how the task was achieved. The contractors had about 50 to 60 men and to speed up progress Drummond provided £50 for the mens' bedding and assistance in roofing a "cot-house" (cottar's or labourer's dwelling) on the bank. They started at the SE upstream end of the island and raised the bank to full height gradually working round the island. The workers received 3 pence per cubic yard of earth and 3½ pence per cubic yard if it was "dressed" or tamped down and turfed. Usually their contracts gave them a length of bank to complete to full height but some were employed at piece rate. Posts with cross members inside the bank indicated the finished height. The soil seems to have been moved from the island floor using wheelbarrows on planks and "bridges" across the growing pond where soil had been removed. They were paid according to the volume of the pits they had dug. The final volume of these banks was 33,246 cubic yards which is the equivalent of lowering the central

77.5 acre area by 3.2 inches. The inside of the island was leveled after the banks were finished before it was ploughed

The slopes of the bank were supposed to conform to wooden frames or templates that had been prepared by Drummond and Erskine. Unfortunately Drummond changed the slope during the operation probably weakening the structure. Instead of having the straight uniform slopes as indicated in the missive he decided to make the outer bank slope gently for the first 3-4 feet to the high tide mark, then become much steeper for the last 3-6 feet so it was hollowed in the middle. Similarly on the inside he made the bank steeper hoping to gain more inner agricultural land as well as reducing the final volume of the bank and hence his bill. As a consequence the top of the bank was often significantly less than the three feet in width originally envisaged. The outer slope was covered or sealed with turf cut from the inside of the bank. This vegetation was important to stop the bank being eroded and the turves had to be cut as thick as possible and to be tamped into position working from the bottom to the top. The final accounts refer to five days work delivering stones. These might have been used to armour the lower outer bank, which is currently covered in one foot diameter broken rocks.

The first problem arose at the beginning of August 1806 when Cameron went to Drummond's house in Perth to tell him that the workmen had deserted. The partially completed embankments would have been very vulnerable and the workmen no doubt realised they had their employers over a barrel. The water did indeed break over the bank during a "stream tide" and Cameron warned that Drummond's cattle would starve unless 800-1000 cubic yards of earth was used to patch up the breaches. Drummond was persuaded to go to Alloa to try to smooth over the differences with the labourers and find them better lodgings with farmers in the neighbourhood. The contractors claimed they could not be held responsible for the damage since they had no control over the workmen and asked Drummond to make examples of some of them.

As a consequence an action for damages was started in Stirling Sheriff court against four workmen from Airth and Dunmore. Drummond claimed that they were in breach of their contract with him because they had only half finished the 80-yard section of bank they had started. A warrant was issued and on August 11th they appeared to answer the allegations. The workmen claimed that Cameron had found some frivolous fault with their work and had insisted they raise the bank to nine feet. They said this was not part of their agreement and it was much harder to raise earth to this height than to the original four feet. As a result Cameron dismissed them.

Immediately after receiving the summons the labourers raised a counter action against McDonalds and Cameron for the pay they had not received. Cannyly the workmen argued they had no contract with Drummond to breach and their agreement was with McDonalds and Cameron. Drummond claimed that their contract was with him and that McDonalds and Cameron were only his superintendents on site. As will become apparent later Drummond was to

rue the day he advanced this argument. After a long legal wrangle the Sheriff accepted the workers' view and granted their claim and costs which Drummond found "*heavy and hard*".

In the autumn during one of Drummond's infrequent site visits he appears to have become dissatisfied with the quality of the workmanship. There was concern that the bank was subsiding because earth had not been broken down and compacted sufficiently. On October 23rd his farm manager Reid (who was already ploughing the island) informed him the banks were finished though he remained concerned that "*in two or three places the banks are fallen with those heavy rains and I am of the opinion much more of it will go the same road*". Drummond soon went to investigate and wrote to Reid "*After looking over the height of the dyke I am much afraid a good deal of it is too low. I wish you to take William Irvine and James with a few large pins and divide yourselves round the bank and, by a signal to each other, as near to high water as you can judge, drive the pins into the bank to the water, by this you can know if the bank is equally level ... I am certain that the north and west sides are too low so the McDonalds must put on as much as to make the measurements and leave the bank agreeable to my contact with them*".

A few days after this correspondence Drummond went with David Buist, a land surveyor from Perth, to measure the banks so their volume could be calculated and the contractors paid. Buist found the work in an unsatisfactory state and not fit for measuring but having gone so far he did so "*that he might not be troubled going back again*". In later court proceedings Buist testified that the work was not consistent with the original missive, there being areas of bank that were too low as well as stretches where the breadth was less than agreed. These faults were pointed out to the contractors and the final volume of the bank calculated as though the faults had been corrected.

According to the McDonalds and Cameron's account dated 29th November 1806 the final cost of the embankment was £800 12s 8d. Drummond paid most of the balance keeping back £87 because he was not completely satisfied, particularly with the inner drainage ditch or cut.

On Christmas Day 1806 the seemingly inevitable happened; there was a terrible storm and "*The spring tide overflowed all those parts of the bank which were below the proper level and thereby not only laid the island entirely under water but did very great damage to the embankment itself. In some places the bank was undermined and in others it was softened so much that it burst and fell under its own weight*". A subsequent survey of the damage indicated two major breaches where the bank was swept away; one on the east side over the original site of a creek or "gullet" and a much larger one at the northern downstream end of the island.

Drummond considered the disaster to be the result of poor workmanship and refused to pay the balance due to the contractors, intimating that he was to insist in an action both for implementation of the contract and for damages of £300. The contractors also raised an action for payment.

After some initial proceedings the Sheriff-substitute of Perthshire pronounced an interlocutor or interim judgment in which Drummond was

directed "to prove the work had not been executed according to the terms in the missives" and "by the inspection of Mr Peter Painter, near Newburgh, or any other scientific man ... to compare the present state of the bank with the regulations laid down in the missives and if any difference be found to explain how that may have arisen". McDonalds and Cameron were charged "to prove their allegation that the work was complete and taken off their hands and that Robert Drummond was satisfied" and establish that any changes made to the original specifications were "done in Mr Drummond's sight and by his direction".

The scientific inspection was subsequently carried out on 4th March 1807 by Peter Painter from Mugdrum Inch (a similar embanked and inhabited island in the Tay) and David Buist the land surveyor. They found a number of faults. The bank had subsided where it had not been properly compacted, the outside slope was hollowed not straight, the top of the bank was too narrow and the outer covering sward was inadequate. It was the firm opinion of these scientific men that "if the bank had been finished according to the tenor of the missive, the earth properly broke and the seals clapped down from bottom to top, the high tide of 26th December would not have broke down any part of the north side which breach with the breach at the gullet has laid the island open".

Although the report is very illuminating it was never put before the Sheriff because the McDonalds and Cameron produced members of their workforce who testified that Drummond himself had directed them to deviate from the original agreement (probably to save money). They considered themselves superintendents bound to obey Drummond's changing wishes, not contractors with an agreed set plan. Although Drummond tried to refute this argument he had been trying to establish the very opposite in his action in Stirling against the deserters. In a letter to the Stirling Sheriff he stated "*The sea bank was made by the pursuer (R. Drummond) himself and the McDonalds and Cameron wrought only under his directions as superintendents*".

Amongst the court papers there was an interesting defence testimony aimed at establishing the tide was exceptional. It was given by James Guild whose father had been tenant of both Longcarse farm and the island for the previous 30 years. He stated that the river level on 26th Dec 1806 was eight inches to a foot higher than ever he saw it before and that long established, consolidated banks for 1½ to 2 miles upstream were also breached including those round the upstream Tullibody Inch.

This case rumbled on with appeals and counter appeals until 1810 when finally their Lordships found in favour of McDonalds and Cameron and Robert Drummond had to pay up. We know from the testimonies in Court proceedings that the banks were subsequently raised by a further 3 feet and the hollows in the cross sectional profile were removed to finally make the island secure. The internal drainage ditch was also completed.

The Tack of the island was eventually signed in 1811 and the annual rent set at £80. It included provision for the construction of a house and farm buildings the cost of which would be reimbursed at the end of the lease. The terms required Drummond to "*maintain at his own expense whatever cuts, drains, tunnels*

or outlets that are already made or which hereafter may be necessary for securing and preserving the said embankments and likewise to preserve the outer verge beyond the embankment so that the same may not be washed away or encroached on by the weather and that John Francis Erskine being always bound to furnish said Robert Drummond with brushwood from the estate at Alloa for the purpose of warping any of the ground". Warping was the practice of driving in seven foot stakes four feet into the mud at four foot centres and weaving brushwood between them to form a fence to restrain mud and silt.

The quality of the land was immediately improved from the original cattle-grazed salt marsh and the terms of the tack refer to manuring and under-planting of grain crops with grass. John Erskine reserved the right to plant three acres of trees which had to be protected from the plough and three old beech trees which may well have been relics were still present in the 1970s.

Drummond's household and business papers (1812-15) in the Perth Archives give some interesting snippets of information about the island. The account from the smith Peter Dunn describes 41 visits over a year to the smith house on the island to shoe horses and sharpen and reset ploughs etc.. The sadler John Gilletlie was as important as a modern mechanic. In his half yearly bill he details 21 days when he was repairing harnesses and bridles, oiling saddles, fitting bits etc. The thrashing mill on the island was also repaired prior to the harvest of 1815 requiring 19 days' work and 7 lb of plate iron to fix it. Subsequently the main pinion cog had to be replaced. This involved four man days to make a wooden pattern and six man days to cast and refit the new one. Although the island location must have been inconvenient for getting crops and cattle to market it could have its advantages; for instance 300 bolls of lime shells (approx. 20 tons) were shipped directly from Charleston to the Inch, to improve the land.

The construction of the house and farm buildings was still taking place in 1815 and John Grasson's 1817 map (Figure 4) only shows partly completed farm buildings. Amongst Drummond's papers there is a bill from Lennox and Mitchell for 33 days mason work on the Inch including the construction of a chimney and 50 feet of pavement. John Millar also supplied 37 feet of lead pipe so there must have been some sort of plumbing in the buildings. Originally there was a bothy attached to the east side of the farm buildings and this probably provided accommodation during this early period.

Robert Drummond died aged 51 in June 1819. His estate papers indicate that he had built the steadings and threshing mill but had not completed the farmhouse. The island must have repaid handsomely his £800 investment since in the inventory of his estate the crop was valued at £730. He had also become the tenant of Bowhouse farm close by. The lease of the island was transferred to William Mitchell who finished the very substantial buildings and reclaimed the cost from John Francis Erskine. Two local masons, John Smith and Andrew Lennox, valued the buildings at £839 and John Francis Erskine gradually paid this off. Their description, together with a 1865 plan of the buildings, is shown in Figure 6.

Ironically the engineering feat of embanking the island was almost rendered unnecessary by another even more ambitious plan. In 1822 as part of a scheme to "Improve the Navigation of the Forth" it was proposed that the river should be straightened by cutting through Longcarse Rhind peninsula, leaving the island in an oxbow and shortening the distance to Stirling by two miles. During the period 1814-1817 the third upstream Inch on the Throsk shore appears to have been incorporated into Bandearth peninsular. The embankment of the islands and the river shore were welcomed by those navigating the Forth since constricting the river both deepened it and helped scour away silt.

The Mitchell family was to hold the lease of the island from 1820-1887, employing a series of farm grieves to manage it. William Mitchell was one of Alloa's energetic entrepreneurs. After expanding his farming interests in the Alloa area he progressed to become a miller, corn merchant, maltster, brewer and baker. He was also a member of the ship-owning syndicate which eventually evolved into the Ben Line Steamers Ltd and a co-partner in the lucrative Alloa Coal Company. William handed the island lease on to his sons in 1830. His connection with the island was not severed even after his death because on May 10th 1856 a ship named after him was towed past the Inch on its maiden voyage to Leith. This full rigged 180 ft long 611 ton ship designed for the India trade was constructed in Johnston's Stirling Yard. She was the biggest boat ever built in Stirling and as a consequence was launched sideways in front of thousands of onlookers. William Thompson, the ship's owner named it posthumously after his old friend and had a likeness carved for the figure head.

The censuses show that in the latter half of the century the island was usually occupied by the leasee's foreman, his wife and three helpers, some of whom resided in the bothy.

Census	People living on the Island	Notes
1841	3	Two agricultural workers and a female servant
1851	?	Faded entries
1861	6	Foreman(Morgan), wife and child ... Two ploughmen and an agricultural servant
1871	6	Farm Grieve (Martin) wife and daughter and three agricultural workers
1881	7	Farm Grieve (Martin), wife and two school children in farm house with three agricultural labourers in a bothy.
1891	6	Farmer (Westwood), wife and son ... domestic servant and two agricultural workers
1901	7	Farmer (Westwood), son, daughter-in-law, grandson (born on Inch) ... domestic servant and two agricultural workers

William Mitchell's sons probably improved the farm during their tenancy. In Tait's 1883 account of agriculture of Clackmannan they are credited with

extensive use of land drains on their farms and the Inch certainly has them. In earlier accounts the drainage ditches emptied at low tide through more than one sluice but in the 1865 plan there is only one pipe or culvert through the bank at the lowest northerly end. It may be that manually operated sluice gates had been replaced by an automatic flap valve. The banks and internal drainage seemed to have been very effective though the highest tide (25 ft 9 in) for 26 years in Feb 1899 did flood several fields as well as parts of S. Alloa. The Earl of Mar remodelled the central square steading yard of his Alloa farms in the 1870s so that they were roofed with two sets of feeding boxes up opposite sides and a gangway leading to a turnip house in between. This design was obviously efficient and remained in use for a hundred years.

Life could be very hard on the island and during the winter of 1881 the local paper describes icebergs two stories high in the river. In 1887 the lease passed to 52 year old William Westwood who had previously assisted his father on another of the Earl of Mar's farms at Dollar. He was probably suited to island life being a "quiet and retiring" person who eventually gave up the lease, aged 70.

The ferry running across the Forth just north of the island is first shown on the plans of the Earl of Mar's estate in 1710 and then again on William Roy's map of 1745. We know that latterly the islanders paid an annual fee to the ferry to carry grain, cattle and machinery to and from the Inch's jetty. The 1865 plan shows a flagpole on the northerly tip of the island which was used to summon the boatmen. The early ferry had four oarsmen who were contracted for the year (like farm labourers) and got their meals from the boathouse. They were used to carrying livestock since a major role of this service was to carry thousands of sheep and cattle destined for the Falkirk Tryst. Crossing the river could be a hazardous venture and sometimes a combination of wind and current would sweep the 'cobble' down as far as Airth. The craft was unstable and on Feb. 25th 1807 the movement of an unsecured carriage caused the boat to capsize with the loss of seven souls.

In 1822 Mr Bald, the famous mining engineer, published innovative plans to replace the rowing boats with a double-ended steam-powered paddle ferry (equipped with ice breaking equipment). According to Ian Brodie's *Steamers of the Forth*, the Earl of Mar subsequently introduced a steam-powered catamaran vessel in 1823, charging 4 pence per beast. This in turn was replaced by "Tulliallan Castle" which had originally served at Kincardine ferry. In 1852 the steamboats were declared unseaworthy and Mr Falshaw, a Perth businessman, replaced the "rickety and superannuated" ferry with a new steamer "Jane". It ran once an hour but was withdrawn and sold three years later when business declined. The ferry reverted to four yawls and a pinnacle with oars. After the construction of the railway line to South Alloa the ferry reassumed importance and in May 1869 the Caledonian Railway agreed to run an hourly steam ferry boat adapted for transporting carriages, horses, and cattle. They introduced a small double-bowed paddler "Countess of Kellie" which ran for 16 years. In 1885, with the completion of the Alloa railway bridge,

the rail company no longer needed the ferry and leased it to Alexander McLeod who built the small steam launch "SS Lord Erskine" at Grangemouth to service the crossing. When traffic was heavy she towed a barge but eventually this was insufficient and an additional launch the "Countess" was introduced in 1900.

The "Lord Erskine" was replaced in 1905 by "SS Hope", a twin screw narrow draught boat built specially in the McKay brothers' Alloa Kelliebank yard. The 63 ft x 23 ft x 3 ft 9 in vessel powered by compound engines had a Board of Trade certificate to carry 240 passengers and seven motor cars. It made eleven double journeys each day, sometimes pulling a barge. The crossing, while short could be dangerous and the rather aptly named "Hope" was often carried downstream several miles by the tide. Mrs Davidson (née Stevens) who lived in S. Alloa from 1910 had to take the ferry to school at St Mungos in Alloa. She remembers it stopping to pick up sheep, pigs, cattle and tons of grain from the island jetty on its way past. The Macleod family ran the ferries back and forth for 56 years without mishap until 1936 when a general loss of trade and the opening of the Kincardine Bridge made them redundant. The "Hope" was superseded by a 35-seat motor boat Sunbeam operated by Jimmy Bremner who maintained the essential foot passenger link until 1939. Unfortunately this was no substitute for the islanders who needed to be able to move cattle, machinery etc.

During the 19thC there was a considerable traffic up and down the Forth past the island. Naval munitions were carried to the depot at Throsk because the river was considered safer for explosives than the road. The "Windings or Links of the Forth" had also become a "celebrated" tourist attraction and from June to September luxurious paddle steamers used to ply up and down daily between Leith and Stirling. Islanders rowing across the river could avoid the wash of boats powering downstream to "shoot the bridge" (avoiding dangerous cross currents) by watching for the smoke produced by the steam engines turning the central span of the Throsk railway bridge.

From 1900-2000: The last inhabitants

In 1906 the lease for Alloa Inch was taken by William McLaren who was farming the adjacent Longcarse farm and a well known agronomist in the district. When he died in 1914 the lease passed to Andrew Boyd who married and had three daughters, one of whom is still remembered as a Grangemouth school teacher. The OS plans of 1900 show little change on the island except the addition of another jetty on the Longcarse side. By 1922 a 36 x 15ft fisherman's hut had been constructed on the SE bank which was surrounded by net drying posts. Apparently, when salmon were running, fishing time was so precious the men could only afford to snatch a few hours sleep during the unfavourable tide, so it was very convenient to be able to use the hut which was furnished with bunks.

From the local valuation roles we have constructed the following list of leaseholders:

Lease holder	Period on Island
Robert Drummond	1806-1819
William Mitchell	1820-1830
A. and A. Mitchell	1830-1887
William Westwood	1887-1905
Wm and James McLaren	1906-1913
Andrew B. Boyd	1914-1923
Charles McGregor	1923-1942
A. and F. Russell	1942-1951
Gordon MacGregor	1951-1991

During the early part of the 1900s the island witnessed several rather unusual events. In August 1920 a surrendered World War I German destroyer moored for salvage on a mudbank at South Alloa was swept upstream during the night until it crashed into the Throsk railway bridge demolishing a stone pier and two spans with it. The boat was eventually cut up by McLeods of Alloa using oxyacetylene torches coupled to carbide generators. In 1926 workers arrived on the Inch from the Carron Iron Works to cut up the remains of an old beached wooden ship to keep the furnaces hot during a coal strike. This boat was described in the press as a whaler but locals say it was the remains of a windjammer that caught fire at South Alloa and had to be pushed away from the wood yards and beached on the Inch. The boat's keel still survives on the foreshore.

The South Alloa shore was very active during the early 20thC as the producer of pit props for the rapidly expanding mines. Boats from Norway, Finland and Russia would tie up while the timber was unloaded directly in three adjacent wood yards. An extensive rail terminal carried the props away to the mines. While most of the boats going up and down the Forth used "The Kersie Reach" on the S. Alloa side of the island, the empty lumber boats had to turn round the Inch using the shallower "West Roads" or "Longcarse Reach" which was dredged "to let the Norwegians get home".

The S. Alloa community including the islanders supported a CO-OP grocery store, a cobbler, a post office, a corner sweet shop, the Ferry Inn and Kersie primary school with about 25 children. A fish man, a baker and a rag man selling clothes and household implements also used to visit the village. In spite of its vulnerability the island of Alloa Inch might well have been drier than the houses in S. Alloa which frequently flooded at the highest tides.

Two McGregor brothers from Hardilands Farm, Bothkennar were to lease the Inch for a total of 60 years. Initially Charlie lived on the island from 1923-42, looked after by his two sisters, Maggie and Minnie, who took turns to keep house for him. He was helped on the farm by a local character, "Old Jock" Stewart, who is still remembered for his long beard, unkempt appearance and the fear of his fleas. He lived in the bothy with his cats, collecting meals from the farm house door. Jock used to row across to the CO-OP in South Alloa to get his messages before visiting the Ferry Inn for a dram. Inevitably whilst he

was there the local boys used to tie his boat tightly to the top of the mooring post so that as the tide went out it was left suspended way above the water. Charlie's cousin "Nett" Findlayson now aged 95 spent the summers from 1924 on the Inch. She recalls that boatloads of people from North and South Alloa would meet midway on the island jetty for singsongs led by fisherman Geordie McKeon.

The 80 acres of flat fertile central fields were used to cultivate oats, wheat, barley and carse beans. Forty cattle could be accommodated in the byres and these were restricted to grazing the 20 acres of banks outside the internal drainage ditch and also a two acre field in to which they also had access. Charlie initially farmed with three Clydesdale horses one of which crushed his ribs. The island's first Fordson tractor was not much more cooperative and would not readily start until eventually enlivened with an ex-aircraft magneto. The ferry boat and a wooden barge were used to move grain and cattle from the island so the opening of the Kincardine Bridge in 1936 and the loss of the vehicle ferry the "SS Hope" was a serious blow. Charlie with help from local fisherman Willie McLeod, had to improvise by constructing a platform between two boats to carry the six-ton hay bailer across, a feat reported in the local paper. Charlie left the island in 1941 to return to Hardilands Farm at Bothkennar which he farmed until he retired aged 92, finally passing away aged 99.

In December 1936 the father of the current Earl of Mar and Kellie sold the island to Archibald Russell Ltd, a coal company from Glasgow. A farmer from Denny, confusingly also called Archie Russell, took over the tenancy of the Inch in 1942 for £82 pa. Apparently the lack of the Alloa ferry created major transport problems and nobody wanted to lease the farm. The Russells took on the lease to provide winter feed which was in short supply during the war. Initially Archie Russell's son Findlay lived on the island followed by a manager James Scobie but then it was sublet to Archie Russell (junior). The difficulties created by the loss of the ferry were graphically illustrated by Archie's initial attempt to take eight bullocks off the island in a flat-bottomed pontoon barge towed by a rowing boat. The unfortunate animals decided to look out the same side of the boat together which caused it to capsize. Most of the cattle swam to shore at various places down the river but two made for a navigation buoy. Archie set out in the rowing boat to get them but as he approached the animals abandoned the buoy and swam towards his small craft. He had no idea how quickly they could swim and had great difficulty in rowing fast enough to keep them from boarding.

The transport difficulty was resolved in 1946 by the purchase of a small ex-World War II engine-less landing craft. Apparently because the engines had been provided by the "lease lend" agreement with the US they could not be sold with the craft. To get it home Archie went to Glasgow where he purchased an old milk round horse from the CO-OP. The horse was then walked to Bowling at the end of the Forth and Clyde canal and over the next three days the craft was towed back through the canal to Grangemouth. "Daisy" the horse

was loaded onto the boat, which was then towed to the island where both horse and barge spent the rest of their days. Initially the landing craft had to be towed by rowing boat back and forth but one of the original Chrysler engines was eventually purchased and installed by local fishermen in return for a supply of eggs. The remains of this craft can be seen next to the current slipway at Alloa Inch and Daisy is buried under a pear tree. Bringing heavy threshing machines across to the island was difficult using the barge since the height of the tide had to be judged exactly to get the equipment onto the jetty. This delicate operation was the subject of an illustrated article in the *Scottish Farmer* of February 1947. The high quality timothy hay they grew was sent by rail to Newmarket for race horses.

During the 1939-45 war the Alloa shipyard to the north of the island manufactured landing craft. These were launched down the slips towards the Inch and a red flag was flown as a warning to river traffic. Because the area was of great strategic importance, no artificial light was allowed at night and this made farming and getting across the river on dark winters evenings even more hazardous than usual. The island, together with the Royal Naval Armament Depot at Throsk, were photographed by the Luftwaffe in 1939. Two prisoners of war were allocated to help on the farm towards the end of the hostilities and they were housed in the fisherman's hut. Archie eventually purchased the hut and shipped it to Bo'ness where it was reassembled as a Gospel Hall. During his six years on Alloa Inch Archie married Mary Bell and another islander McIsaac Russell was born.

Alloa Inch was never seriously flooded during Charlie MacGregor's or Archie Russell's tenancies and the flap valve assembly, which allowed drainage at low tide worked efficiently. There was no report of mishap when Tullibody Inch was completely submerged with the loss of 30 sheep in 1945. At this time the drainage ditch, which ran round the inside of the banks, was only 3-6 feet wide, testifying to the effectiveness of the banks. A Coal Company plan of 1936 shows that the island farmhouse was connected by a $\frac{1}{4}$ inch lead pipe under the river to the water mains at Longcarse farm. From time to time fishing boats would sever the pipe as they dragged their anchors. When this happened the two ends were found at low tide from a rowing boat and ropes attached. The ends were then hauled into the boat where a plumber, soldered them back together. This was a tricky and very dangerous operation since the weight of the lead pipe effected the stability and buoyancy of the boat and it all had to be done in the short window at low tide when the river flow was minimal.

Between tenancies the Quinn family lived on the island for a short time initially in the fisherman's hut and then for a few months in the farmhouse. Tammy Quinn was a ploughman turned miner and he and his wife Jean had an expanding family. In 1954 with the nationalization of the coal companies the ownership of the island passed to the National Coal Board along with Archibald Russell's mines.

The last occupants of the farm were Gordon and Betty MacGregor and their two daughters Margaret and Shona who were raised on the island. The

following details of their lives are taken from an account recorded by Betty MacGregor just before she died in 2001. Gordon had helped his older brother Charlie on the island farm during his school holidays so when the let was advertised he jumped at the opportunity. The couple married on 24th November 1951 and one week later on the 1st December they were installed in the farmhouse together. The press took up the romantic story of the newlyweds "Idyllic Life" in "A Garden of Eden Just Made for Two". In reality it must have seemed rather a daunting prospect for Betty since the winter ice flows and high winds could mean being stuck on the island for days. At first they rowed back and forth to the mainland using an ex-ship's lifeboat but soon afterwards they bought an outboard motor for it.

Changing tenants on an island differs from normal practice as the departing farmer can not simply move all his equipment, hay, stock etc. or auction it at a farm sale, so two arbitrators had to agree to fix a fair price. Gordon used Archie Russell's iron landing craft for a year but it leaked a lot and was difficult to manoeuvre. Gordon was told that if it sank he would be responsible for its removal from the river bed, so he replaced it with a wooden Canadian landing craft and towed it with a 12 foot marine plywood speedboat. Keeping the boats from getting snagged during the rise and fall of the tide required constant vigilance. On one occasion the speedboat caught under the pier and was flooded with salt water by the rising tide. Not only was the engine waterlogged but the oars had been washed away too, so the family had to resort to rowing to Alloa with the byre shovel.

Gordon overcame the problem of shipping the heavy threshing machine and finding twelve men to run it by purchasing the first combine harvester in the area at the 1952 Highland Show in Alloa. They found the island's special microclimate and alluvial soil produced such good yields that Betty who did the "bagging up" was sometimes unable to keep up with the combine's production of grain. They added potatoes and "mashlum", a mixture of oats and beans, to the island's crops. Besides Ayrshire short horn and Aberdeen Angus cattle the family had pigs, a large flock of about 150 Aylesbury ducks and about 400 Rhode Island Red hens. They supplied eggs and plucked and trussed chickens to the local factory workers. They also fished from two fishing smacks and in the financial year 1963-4 netted 560 crans of sprats (cran=170 litres or 4 x 7 stone baskets) as well as white bait and small herring.

The house, which was whitewashed annually, was quite big with eight rooms including a large well-equipped modern kitchen and bathroom. Apparently the 20 doors in the house had originally all come from a ship being dismantled at Alloa. There was a fireplace in every room so in winter the house was kept warm by huge log fires. Initially there was no electric power, only bottled gas and paraffin-burning Tilley lamps but eventually an electrical generator was installed. In spring the road leading from the house to the pier was an attractive sight lined with blossoming fruit trees and daffodils.

It was obviously difficult to organise life on the island particularly since there was no telephone. An additional kitchen window was inserted which

looked directly out to the jetty at South Alloa where their attention could be attracted by car horns and flashing headlights. On one occasion Gordon was fishing below Kincardine Bridge when a fierce storm erupted and the engine failed as pounding waves started to flood the boat. The master on Kincardine Bridge saw that the smack was in danger of being blown against the bridge and raised an alarm. The boat was feared to have sunk when watchers lost sight of it and fire engine search lights failed to pick it out. News travelled fast to S. Alloa and someone attempted to shout across to Betty on the island with a loud hailer to inform her that her husband had been drowned but fortunately Betty couldn't make out the message in the noise of the wind. Later Gordon returned to the island safe and well and explained how he had nailed blankets from his bunk to the mast to act as sails to get them out of difficulty. The tide tables and bus timetables dominated the MacGregors' lives and trips to the doctor, dentist and even to the cinema had to be planned in advance. There were similar problems bringing people onto the island and both the local vet and doctor were very accommodating and never complained.

Getting to school was a problem for the two young girls. After visiting Alloa Inch the Director of Education gave Betty permission to teach Shona at home up to the age of nine. Every morning the kitchen was turned into a schoolroom with desk and blackboard. Miss Baker, a guidance teacher visited once a month to assess her progress. Arrangements were made for her to attend school in Alloa on afternoons when Betty was shopping. When Shona was nine and her younger sister Margaret was five the Scottish Education Department indicated that it considered that Shona had reached a stage "whereby regular instruction and the community of other children was required". The Education Committee established that there was no onus on the parents to live in a place where their children could get to school easily. So Shona and Margaret had to be taken to school by boat every day or at least when tides and weather would allow. The education authorities were obviously impressed with Betty's teaching skills and offered her relief teaching, firstly at Tulliallan Primary School and then at Airth Primary School where ironically she found herself teaching her younger daughter Margaret.

On 30th December 1960 an exceptionally high tide resulted in the river flowing over the banks and starting to fill up the interior of the island. Initially the family thought there was snow on the tops of the banks but it was foam from the water pouring over. Thankfully it stopped just short of the house but it took six weeks for the fields to drain. Margaret recalls that subsequently during the very highest tides water would leak over at a few points and although the family did some repairs the Coal Board never did anything about it.

It was not flooding that was to drive the MacGregors out of their home but their vulnerable water supply. In the late 1970s the reinforcement of the Longcarse farm banks crushed the original lead pipe. A new silvered copper pipe was laid which would resist the corrosive salt water at a cost of £3,000. Not long after it was laid the family returned from a wedding to find that there was no running water in the house and then soon discovered that a section of the

new pipe had been stolen for scrap. Initially they tried to use plastic piping as a replacement but in spite of weighing it down with the old Fordson tractor wheels the tide dragged it and it burst. The family could not live without water and so were forced to move to their mainland home. The farm could not be kept fully operational without running fresh water though canisters were taken over as a stop gap. Eventually the cattle were taken off leaving just hens and Aylesbury ducks and the crops were also reduced to hay and potatoes.

During 1981 Gordon was approached by an animal behaviourist from Stirling University Psychology Department. He was interested in studying whether freedom would reverse the self abusive behaviour his macaque monkeys had developed in captivity. He asked if he could free eight on the island and Gordon could see no harm in this. Apparently Clackmannan District Council had refused to grant permission for the release but Gordon was unaware of this. Rather than see the animals destroyed the researcher decided to put three of them on the island anyway. A year later they were discovered by the District Council who ordered them to be recaptured and moved to Edinburgh Zoo.

The farm was kept going until the early 1980's when the island was inundated again in 1983 (Grabrovaz, 1989). This time the water did reach the inside of the house and as the tide went out the weight of water inside the island carried away the sluice and the surrounding north bank. As a consequence the island was subsequently inundated at each tide. The flooding was disastrous for the MacGregors who lost all the farm equipment and many of their belongings that were still in the house.

During their residence the MacGregors could hear mining activity beneath their home. Plans of Polmaise 3/4 colliery at Fallin show there were extensive workings from 1949-54 in the Hartley seam and indeed there was actually a mine roadway intersection 1890 ft under the farmhouse. The workings covered most of the south half of the island and crossed Longcarse Reach to the Rhind on the west. This seam was not mined to the North of the farm because the two areas were separated by an E-W fault running approximately under the same gully that gave Drummond so much trouble whilst initially constructing the banks in 1806. The pit was allowed to flood in 1959 when the pumps were withdrawn. There was subsequently a plan to connect the Fallin pit by a tunnel to Longannet power station but the scheme was abandoned in 1985 as uneconomic.

We are not aware of any formal investigation of the extent to which mining-induced subsidence was responsible for the demise of the island. There are records of statements attributed to Coal Board surveyors confirming surface subsidence in the late 1950s (SWT records) and Grabrovaz (1989) also notes channel depression in the SW corner of the island, the main undermined area. Mining is unlikely to have been the direct cause of the final breach because the North end of the island was never worked; however the flooding which precipitated the final collapse could have resulted from a lowering of the banks in the southwest corner.

Back to nature

Alloa Inch and the surrounding river have always been a wildlife haven and there are vivid descriptions of birds and fish in both the old and new Statistical Accounts. Unusual visitors included beached whales, dolphins, sword fish, a 180 lb sturgeon, a 190 lb seven foot long thorny skate and “gandanooks” or Egyptian herrings (Atlantic Saury). Apparently shoals of these used to get caught by their snouts in the mud and provided a welcome supply of food for the needy. Bitterns were already declining in 1791 and when ‘Mother Cary’s Chickens’ or storm petrels were spotted they were shot to confirm their identity! It is interesting that although large numbers of ducks were recorded there is no mention of geese though spring counts throughout the 1990s record 600 to 3000 pinkfoots. Rabbits and rats were exterminated because of the danger of their burrows weakening the banks but both a deer and a hare were reported to have been swept or swum ashore.

In more modern times the Inch was recognised as an important autumn/spring refuge for migratory geese and ducks and a nationally important breeding site for shell duck. As a consequence, in 1971 the island together with the river upstream to Tullibody Inch, was designated a Site of Special Scientific Interest (SSSI). After the breach of the banks the SSSI was re-designated in 1988 to include not only bird life but also the evolving saltmarsh community. With the ingress of salt water the whole of the inside of the island soon became carpeted with mauve sea asters in autumn and acres of the snowy white flowers of scurvy grass in spring. The Inch now represents 25 % of the saltmarsh habitat in the Firth of Forth. In 2001 Alloa Inches SSSI was amalgamated into the much larger Firth of Forth SSSI.

Central Region Council’s 1981 Local Structure Plan identified the site as a potential Local Nature Reserve and by 1992 CRC acquisition of the island was imminent. Unfortunately the planning officer revealed major problems in managing the reserve which led to the abandonment of the project. They feared that the council would have a moral obligation to prevent further bank erosion and would have to pay a warden to prevent wildfowling. The RSPB was also interested but they too were worried about wildfowling. Eventually the Scottish Wildlife Trust (SWT) when offered the land for £1 by the National Coal Board readily approved the acquisition and the transaction was completed on 16th July 1996.

The island is unstable and intrinsically fragile in the long term. The original bank is still largely in place and has an approximate height of 24 feet above chart datum. It is currently topped by a hedge along most of its length. The Russells made great efforts to remove this natural growth because root penetration and movement in high winds destabilised the bank. The shade and shelter of large bushes also attracted cattle which would kill the surrounding grass and promote erosion. There was also a hedge on the landward side of the dyke which is now only visible as dead stumps in the enlarged drainage ditches. The breach on the north side is exactly where the bank gave way in the 1806 disaster. It has gradually widened from approximately 55 feet in 1990 to 100 feet in 2005. The constant inflow and

outflow of tidal water into the old drainage ditches has eroded them and at a point just NE of the house the original 6-9 feet wide channel is now 37 feet across. The natural gully that ran east-west from a point just north of the farm in Bell's 1800 plan has reappeared inside the drainage ditch. The northern end of the island is bisected by parallel two feet wide creeks running North to South. These presumably represent the tracks of collapsed land drains. If the river flow is low then the central area is not flooded even by 16 feet tides. During extreme events combining floods and spring tides all that remains above the water is the atoll-like embankment. Tide marks reach 30 inches up the farmhouse kitchen walls and tree trunks lodged on the tops of the banks indicate the water must almost over-top them. The farm buildings are gradually collapsing though they are still readily recognisable. A line of dead fruit trees along the track to the slip-way provides a gaunt reminded of happier days. Running northwards along the shore from the jetty are the abandoned hulks of the island's boats including both landing barges and the keel of the old wooden whaler.

Rising sea levels and higher flood levels are predicted and this will result in increased inundation and attrition. There is a danger of erosion of the bank on the upstream SW side allowing the river to break through and flow across the original fields, exiting through the current downstream breach. SWT and SNH (Scottish Natural Heritage) have agreed to a policy of "managed retreat" which to the uninformed might be more appropriately termed "un-managed retreat". Simply stated it has been agreed that attempts to prevent further erosion would be expensive and probably ineffective in the long term. The island is to be left to slowly revert to a mud bank just as Robert Drummond found it almost exactly two centuries ago.

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Figure 1 Pont's map 1580 showing a small island adjacent to Carsey (now Kersie) at South Alloa. Just upstream round the next turn of the Forth another island in the current position of Tullibody Inch is visible adjacent to the Rhind peninsula. Reproduced by permission of Trustees of the National Library of Scotland.

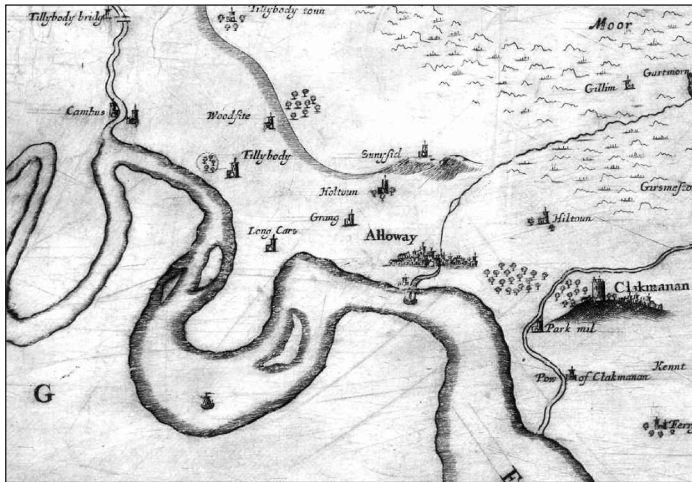


Figure 2 Adair's map of 1681 clearly shows three islands in the upper Forth. Alloa Inch lies to the east of the Rhind peninsula with Longcarse farm on it and Tullybody Inch to the west. A third Inch is located adjacent to the Throsk-Bandeath bank. Reproduced by permission of Trustees of the National Library of Scotland.

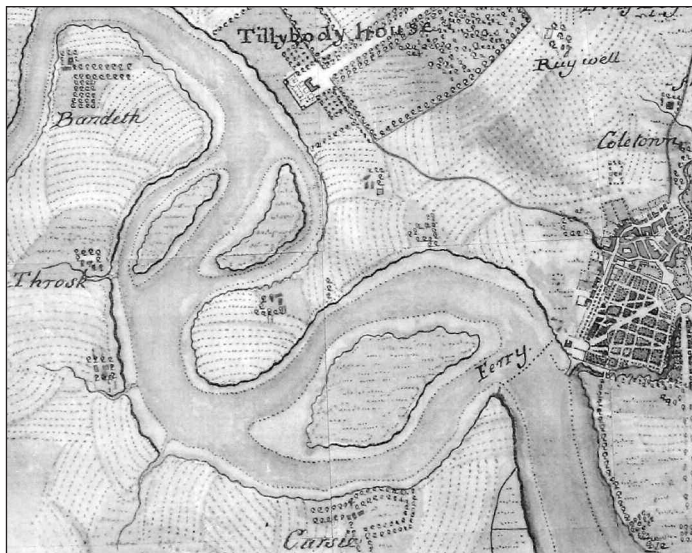


Figure 3 Roy's military map 1747 (redrawn) shows all three islands in very much in their current positions. They bear grazed marshland symbols in contrast to the ploughed fields along the banks. The ferry which was diverted to access the island is shown running between Alloa and Kersieneuk.

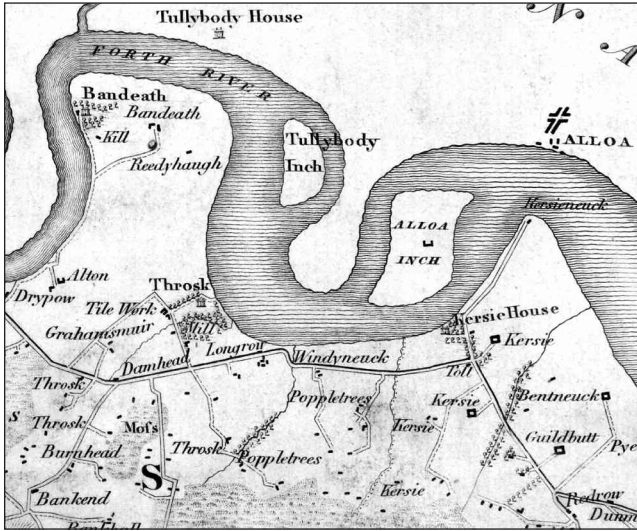


Figure 4 Grassom's survey of 1817 is one of the first maps to identify the island as Alloa Inch (rather than Longcarse or Carsie island) and shows the farm buildings on it. By this time both Alloa and Tullibody Inches had been surrounded by banks and the island on the Throsk-Bandeath shore appears to have been incorporated into the mainland. Reproduced by permission of Trustees of the National Library of Scotland.

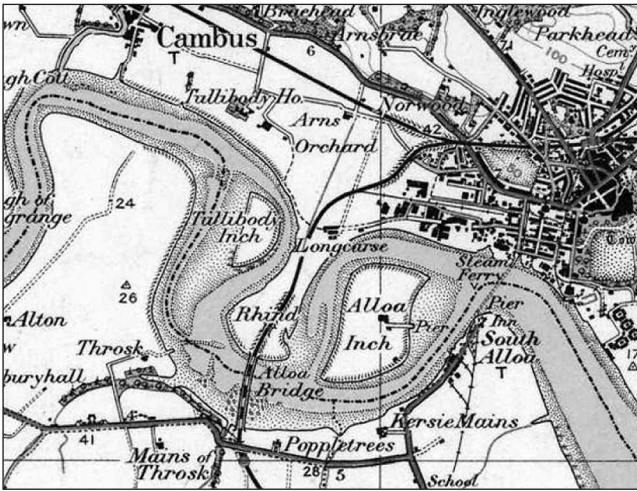


Figure 5 The Ordnance survey map of 1927 shows both the house and farm buildings on Alloa Inch. The village of South Alloa has grown up on the east bank opposite the island pier complete with the railway that served the extensive wood yards. The steam ferry across the Forth could be diverted to serve the island by flying a flag on the NE tip. Reproduced by permission of Trustees of the National Library of Scotland.

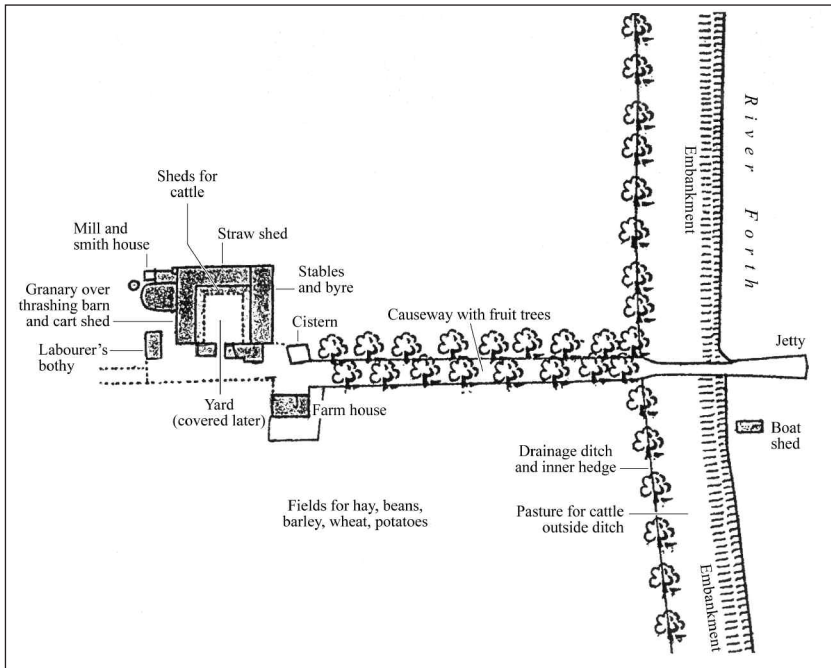


Figure 6 Details of the farm buildings on Alloa Inch redrawn from the OS plans of 1865. They are consistent with the description of the valuation of the farm made in 1821: "A dwelling house of two storey high with a slate roof measuring forty feet in length by twenty-four feet in breadth. A stable and byre in a line or range eighty feet in length by twenty feet in breadth over walls roofed with tyle. A straw shed eighty feet long roofed with tyle. A barn and granary in a line or range eighty feet long and twenty feet wide over walls with a loft above the same for a granary and thrashing barn and also a smith house and cart shed below the granary, all with tyle roofs. A mill shed roofed with tyle: the whole of these round the outside of the steading being covered with sarking and slate. We also found sheds for cattle erected around three sides of the court and a large stone cistern for water put at the end of the stable range".

BOOK REVIEW

THE BATTLE OF SHERIFFMUIR: based on Eye Witness Accounts. Bill Inglis. 2005. 60pp. £3.95. Stirling Council Libraries, Stirling FK7 7TN. ISBN 1 870542 50 9.

'Some say that we wan and some say that they wan
And some say that nane won at a', man.
But one thing I'm sure that at Sheriffmuir
A battle was there which I saw man.
And we ran and they ran, and they ran and we ran
And we ran and they ran awa' man.'

This poem, as Bill Inglis says, is nearly always quoted in any account of the battle. It neatly and mockingly sums up the conflicting opinions that have been expressed.

Inglis' excellent little booklet begins by summarising the background of this first Jacobite rebellion. The Union of 1707 was resented in Scotland for a number of reasons, some economic, some political, and some religious. There can be no doubt that James, the Old Pretender, as the legitimate son of James VII of Scotland, had a better claim to the throne than George of Hanover. German George couldn't even speak English. But George was Protestant, James was Catholic, and that decided the matter. No wonder that deeply held religious opinions drew their adherents to the Jacobite cause, and Inglis cites many local examples.

The Earl of Mar had been the Secretary of State for Scotland, but when he learned that George I would not maintain him in office he escaped (disguised as a workman) to Scotland to lead the rebellion there. On September 6th 1715 the Standard was raised at Braemar, and on the 28th Mar arrived at Perth, which had been daringly captured two weeks before by the eighteen year old John Hay of Cromlix.

Mar was a politician and an administrator, not an experienced general, whereas the Duke of Argyle, leading the Government forces, had had a distinguished career as a professional soldier. Mar's forces appeared much larger, (perhaps 8000 infantry and 1000 cavalry), than Argyle's, (about 2250 infantry and 950 cavalry), but there were great differences in training, experience and temperament between them. Inglis describes these differences in detail, quoting contemporary descriptions by participants in the battle. His verdict on the prospects for the fight are '... but the Jacobites with their greater numbers and the élan of the Highlanders had possibly the winning advantage.'

In Perth the Earl of Mar's Council of War decided to force a crossing of the Forth at Drip, rather than to take Stirling, and on November 12th the army advanced towards Dunblane. The present A9, which follows the line of one of

Wade's military roads, built after the '45, was not then available. Mar's army marched along a much earlier medieval road running closer to the River Allan, recently recognised as following the line of the Roman road from Ardoch. This took them directly to Kinbuck Muir, near Naggyfauld and Glassingall. This detail is not brought out by Inglis, though it was recognised by Barty in his account of the battle in his *History of Dunblane*. That account, also first class, does not differ in any important respect from that given by Inglis, but it lacks the liveliness of the eye witness reports given us by Inglis. The Jacobites settled for the night at Kinbuck Muir. Meantime Argyle had occupied Dunblane, and his army was near Dykedale Farm.

From Dykedale Farm a track led, as it still does, up to Sheriffmuir, and early on the 13th of November, the day of the battle, Argyle sent a party of horsemen up to the high ground from which Mar's army down by the river could be watched. These observers were seen by the Jacobites, and Mar decided to advance up the hill on to the Sheriffmuir. Argyle responded by sending his troops up the track from the farm. This track now ends at the MacRae Monument, but probably at that time continued on the line of the present road to near the Sheriffmuir Inn. The Government columns marching up the track had merely to face left to form their line of battle against the columns of Jacobites approaching up the hill, more or less towards the Gathering Stone. Among these columns there was some confusion, graphically described by Inglis. On the other hand the rear of the column of Government troops, due to form the left of their battle line, were not prepared for the furious attack upon them by the Highlanders. Within a few minutes this part of the Government troops under General Whitlam was in flight, some back to Dunblane, some down the drove road to Stirling, via Pendreich and Pathfoot. Some even reached Cornton, and by mid afternoon Whitlam arrived at Stirling Bridge to report his opinion that all was lost.

Meanwhile the Government right, although numerically weaker in infantry, were able to use their superiority in cavalry. Inglis makes very effective use of the contemporary accounts to give a thrilling description of the actions leading to the rout of the Jacobite left and the pursuit back towards the River Allan. It would be difficult to get a better detailed and vivid picture of the battle.

To appreciate this a visitor to the site, booklet in hand, should follow the advance of Argyle's troops up the track from Dykedale Farm to the MacRae Monument, bearing in mind that the modern road past Stonehill Farm did not then exist. From the Monument a path leads to the Gathering Stone towards which the Jacobites advanced from Kinbuck Muir. Much of their approach route was through the area now covered by conifers and cannot be seen from the Gathering Stone. Perhaps the best way to understand it is to view from the far side of the River Allan beyond Ashfield, looking north-east from the high ground near Crofts of Cromlix on the minor road from Dunblane to Kinbuck.

The centre of the battle lines at first was somewhere between the Gathering Stone and the MacRae Monument, although the action soon became widely dispersed. The crossed swords indicating the site of the battle on the Ordnance

Survey maps is almost two kilometres too far to the north-east. The original battle lines would have extended little more than one kilometre, and would not have reached as far as the Sheriffmuir Inn.

Bill Inglis is decisive about the verdict on the fight. 'There is no doubt that the Jacobites failed in their aim and that Argyle succeeded, so it is clear that the Duke won the battle.' Whether one wants an exciting armchair account of a vital battle, or a good guide for a site visit, one cannot do better than acquire this outstanding little book.

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Ron Page

WATER-BORNE TRANSPORT ON THE UPPER FORTH AND ITS TRIBUTARIES

John G. Harrison

Stirling was the site of a small port, receiving some sea-going vessels into the twentieth century. The River Forth is tidal above the harbour to Craigforth (the 'cruives of Forth') where rapids preclude ready movement between the upper and lower reaches of the river systems. The Allan joins the river a little way below that point and is tidal for a short distance. Above the rapids, the main tributaries are the Teith and the Goodie. This short paper looks at the historical evidence for the transport of goods on the upper, non-tidal reaches of these rivers.

Above the tidal limit the Allan is generally shallow, with rapids and broken water; mills (implying associated weirs) are recorded from at least the fifteenth century (1). The Teith, though with a substantially bigger discharge than the Allan, has a similar character. The Goodie flows from the lake of Menteith and is more sluggish; its natural course has many small meanders. Parts of its upper reaches were canalised in 1771 in an attempt to prevent flooding (2) but its lower course still shows numerous short and sharp meanders, tight enough to impede the progress of even small boats. Fords, the Mills of Goodie and of Cardross and the Bridge of Goodie – recorded from the mid-seventeenth century (3) – would all impede boats. The meanders of the Forth between Aberfoyle and Craigforth are wide enough to impose no impediment to small boats and there were no mills, though there are at least two fords.

All four rivers are subject to both spates and low water levels in droughts (4). Taken together with the difficulties of linking to the lower navigation, these problems seem to preclude the use of these streams for significant navigations. In the 1790s the writer of the Statistical Account for Kilmadock commented that 'The river Forth ... is navigable as far as the cruives of Forth, and could be easily rendered so all the way to Gartmore, by deepening one or two fords' The writer clearly considered any existing use of the upper river to be far short of making it 'navigable' (5).

Small boats were, at least intermittently, available as a means of crossing the Forth at Drip (6). There was another boat on the upper Forth at Poldar, primarily for the use of the tenants there and its maintenance was their joint responsibility (7). A tack [lease] at Chamberston dated 1695 included a one third share of a boat on the Forth, the other tenants presumably having the other two thirds (8). There must have been other such boats, used in however limited a fashion for transport along as well as across the river and also for fishing, though bank fisheries may have been preferred to the boats favoured on the lower reaches (9).

A find of several intact seventeenth century pots in the Forth at Gargunnoch

has been interpreted as the cargo of a boat, which had sunk; these pots were of the type made at Throsk, on the tidal Forth below Stirling and Thomas Matson, one of the potters from Throsk, brought his 'bark' [a small boat] down the river from Garden Pow to Throsk in 1701, for which he was rebuked by St Ninians Kirk Session as his voyage broke the Sabbath (10). Finds of pottery in the Balvaig river at Balquhiddier, in the Lake of Menteith, in the Endrick near Loch Lomond and elsewhere, add to the impression that pottery was being regularly transported by water. The Balvaig and Lake of Menteith communicate directly with the rivers being considered here; getting goods from the Forth to the Endrick systems would involve land carriage but the Endrick would then offer direct links, via Loch Lomond and the River Leven, to Glasgow and the west coast (11).

The earliest direct documentary evidence located for transport on these rivers dates from 1581 when four chalders of lime were carried by boat to Doune for repairs to the castle (12). A chaldar would weigh around a tonne. The next direct evidence is a contract dated 28 April 1627 by which John Graham in Menteith agreed to supply Andrew Kerr, skinner in Dunblane, with 4000 oak spokes for cart and van wheels, to be delivered to 'ane house' at Craigforth by 20th December 1627 or sooner if he 'can have the occassione of carying or transporting of thame be watter'. Clearly, boats or suitable water conditions were not always available. Kerr was to be advised once the goods were at Craigforth, presumably so that he could make his own arrangements for onward transport (13). In 1639, 1700 'skaillie' or slates were delivered at Drip Ford for the building of Cowane's Hospital in Stirling, £1 Scots was paid to the boatman for unloading them and the workmen who carried them to a 'house' where they were stored. A further 1300 skailie were delivered to the same site and the whole 3000 were then transported to the town (14). In 1736, two boatloads of lime were to be delivered to the tenant of Inchie (15); Inchie is at NS 592000, close to the point where the Goodie Water flows from the Lake of Menteith and boats might have landed their cargo either from the loch or the stream.

These records (and particularly the use of Craigforth/Drip as a landing area) give new meaning to other incidents where boats are not specifically mentioned. In 1531-2 flagstones for guttering for the royal stables at Stirling were brought to the site from the ford at Craigforth (16). Skailyie [probably blue slate] were carried from 'Droipe cobell' for repairs to the Great Hall in Stirling Castle in 1645 (17). And again in about 1681 slaters at the castle were using 'skaillie that com from the drip Cobell for repairing theairoff' (18). Slates [gray mudstone slates] purchased from Kippenross, beside the Allan, were carried from the bridge of Stirling, suggesting that they might have been brought down the Allan and Forth to that point (19). Alexander Jack supplied 1000 'grat gray sklait' for the castle in 1625 and they were transported by 'boit' [boat]; the entry gives no hint of their origin or where they were landed (20) but Kippenross is again the most likely source and riverine transport is implied. Wood for a building project just north of Stirling was also brought from Kippenross by boat in 1707 (21).

Some goods were also brought upstream on the tidal Forth to the upper navigable limit. That was clearly the case in 1714 when Drummond of Blairdrummond instructed Ralph Mather, master of the 'Elizabeth' ferry-boat of Leith to unload his cargo opposite Kildean, where the laird of Craigforth had delivered his stones (22). But goods coming upstream and destined for Stirling would be more naturally landed at the town's harbour. Skailie, at this period in Stirling as elsewhere, refers to blue slate and typically, these came from Aberfoyle (23). Several of the records mention 'houses' at Craigforth where the goods were stored, obviously referring to a storehouse or warehouse, rather than a dwelling house. The logic of the entries is that slates had been brought down river, either to Craigforth, where they were landed and stored, prior to land carriage to the town or directly down the Allan to the Bridge or Harbour.

Matson's 'bark' seems to have managed the journey past the falls at Craigforth; perhaps it was small enough to be unloaded, taken out of the water and carried. But most of the other cases suggest that this was not a viable and economic option for most of the craft and cargoes. The potential of bringing slates from Aberfoyle to Stirling via the Lake of Menteith and the Goodie must have been obvious. But in 1702, for example, the town of Stirling sought country horses to go to Duchray Craig for slates (24). In 1641-2 so many as 21,500 slates were carried to Stirling, probably from Aberfoyle, by horse (25). There were various possible routes – *via* the ford at Frew, *via* Doune to Dunblane and so to Stirling Bridge, or even *via* Blairdrummond to Drip and so across the river by ferry or ford. All are circuitous and would require a huge number of loads. In 1671, Pearson of Kippenross contracted to supply Jon Miller in West Grange (beside the tidal Forth) with 9000 grey slates but the document provides no hint about how they were to be delivered (26). Similarly, there were sources of lime on the lower Forth and in the region of the middle Bannock Burn and sources of lesser value scattered around the fringes of the western carselands (27). Agricultural lime, which had been available east of Stirling, close to the river for a century or more, was being gradually introduced on the western carse by the later seventeenth century (28) and boat was the obvious way to move it. But so far only a single example (the boatload delivered to Inchie, above) can be confirmed. Chrystal says that lime had been moved on the river prior to the mid eighteenth century, though he gives no details and no source (29).

Some of the records of transport along the rivers were generated by institutions that kept long series of records (the Crown, Cowane's Hospital); others were recorded when disputes arose or because, in the case of Matson's bark, he was reprovved for breaking the Sabbath. These were unusual circumstances and the few loads here are clearly only a very small proportion of the total traffic. It is not suggested that these were major transport systems but water transport clearly offered advantages, even on these less-than-satisfactory rivers. The discussions about canalising the Goodie make no mention of preserving the potential for use by boats so perhaps by 1771 improved roads had already rendered it redundant. But the potential for riverine transport has many implications. For example, the Goodie is so narrow

and sinuous that some sort of specialised boat, perhaps akin to a punt, would probably be required. The potential for finding further remains of boats or their cargoes cannot be discounted. How important was the river to the viability of farms on the western carselands? Why was it sometimes necessary to move slates by horse rather than boat? How significant was the 'harbour' at Craighforth where landing, loading and transhipment between upper and lower navigations must have occurred?

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¹ RMS II 2146, 22 March 1453 is a charter for the lands of Inverallan with the mills; earlier charters merely mention the pertinents of the lands.

² Harrison, 2003, p.119-120 for canalisation.

³ Mitchell, 1907, p.609-610, 'Heir is the river of Gudye with a bridge.

⁴ Flows on the upper Forth were so low that even peat could not be floated in the summer months according to an early 19th century report, National Archives of Scotland [NAS] GD15/46 Memorandum Book.

⁵ Tait, 1977, p.563-5.

⁶ Most records of Drip Coble in the seventeenth century refer to a ford, see, e.g., Renwick, 1887, p.132, for the custom of livestock entering the town by the Drip Ford (5 Nov 1612) and *ibid* p.233 for customs of goods coming by 'the Drip coble, or any other foord of Forth neir thereto' (24 Nov 1660). But in 1715 a watch was to be kept at 'the Dript Coble' on 'the persons ferried at the said coble', Renwick 1889, p.141 (7 Nov 1715). A ferry is

again recorded in the 1750s, see NAS Abercainry Papers, GD24/1/229 (1752) and GD24/1/231 (1754) for tacks of Drip Ferry.

⁷ For Poldar and Faraway see NAS, Stirling Sheriff Deeds, SC67/49/21, p.163-4, tack Dr Stirling to John McKullie: for Polder see NAS, Dunblane Sheriff Deeds, SC44/59/2 p 84-87 tack between James Forrester and James Hay. For a boat at Cardross see NAS RHP 30799 Plan of the Estate of Cardross and Garden, 1761 and www.rcahms.gov.uk. Canmore Website entry for Cardross Bridge.

⁸ NAS, Dunblane Commissary Court, Register of Deeds, CC6/12/5 part 2, f.84 tack of Chamberston with 1/3 part of a boat on the Forth, (1695).

⁹ A wide range of craft might have been available on the upper rivers. In 1597, a leather currach was being used for fishing on the upper tributaries of the Tay, NAS Breadalbane Muniments, GD112/17/2 f.67v, 5th Nov 1594. In 1827, a boat used on Loch Tay was thought too heavy and unmanageable to take down onto the upper Tay, the 'small light boat which Simpson, the late keeper, had for trout fishing' being better adapted to the purpose, NAS GD112/11/9/3/48. For boat fishers on the tidal reaches see Harrison 1984.

¹⁰ Harrison, 2002.

¹¹ Caldwell et al., 1992, p.31.

¹² Mylne, 1893, p.60.

¹³ Stirling Council Archives [SCA], Stirling Burgh Register of Deeds, B66/9/1 f.15.

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¹⁵ SCA, Graham of Cassafuir and Ruskie, PD86/76.

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¹⁷ Imrie and Dunbar, 1982, p.446.

¹⁸ NAS, Exchequer Records, E28/240, Item 6, Receipt by Robert Russell, merchant, burgess of Stirling.

¹⁹ NAS Stirling Burgh Accounts, E82/55/5, 1665-6, discharge, f.34r; *ibid*, 1675-6, f.103r.

²⁰ Imrie and Dunbar, 1982, p.176.

²¹ Harrison, 1988, p.31.

²² NAS Murray of Abercainry, GD24/5/4/19 precept by Drummond endorsed by Mather.

²³ Harrison, 1996, p.56.

²⁴ SCA Burgh Treasurer's Accounts, B66/23/1 discharge 1702.

²⁵ SCA Cowane's Hospital Accounts, SB5/3/1 discharge, 1641-2.

²⁶ NAS Dunblane Commissary Register of Deeds, CC6/12/4 f.166r. Contract between Pearson and Miller.

²⁷ Harrison, 1993, considers some of these sources.

²⁸ For example, NAS, Dunblane Commissary Court, Register of Deeds, CC6/12/5 part 2, f.84 tack of Chamberston, tenant to lay on two chalders of lime (1695); NAS Stirling Sheriff Vouchers of Deeds, SC67/50/6, bundle labelled 1681, tack Graham to Shirray alias Johnstone, dated 1676; NAS Stirling Sheriff Vouchers of Deeds, SC67/50/5 bundle labelled 1679, tack Gourlay to Thomson dated 1677.

²⁹ Chrystal, 1903, p.125.

BOOK REVIEWS

Raploch Lives. edited by; Elma Lindsay, Lindsay McKrell, Liz McPartlin. Stirling Libraries. 72 pp. ISBN 1 8705042 available free.

This 'celebrations of the past' memories of Friday Club seniors interviewed by 6th/7th primary schools in three particular topics;- Growing up, Housing and Food, and Work and Transport, is well done and adds life to the Raploch current Redevelopment Project. It usefully draws attention to two more formal papers on Raploch's history, FNH Vols 9 and 21 – Fish Row by John Harrison, and Bi-Centenary of Raploch by George Dixon.

Christian Maclagan; Stirling's Formidable Lady Antiquary. Sheila M. Elsdon. Pinkfoot Press, Balgavies, Forfar. 115pp. ISBN 1 874012 43 1. £7.79.

For years we have hoped to see Maclagan in print. This is a very welcome study now with some sponsorship from the author's Archaeology Department of Nottingham University, also the Drummond Trust, and the Marc Fitch Fund.

WALLACE'S STONE, SHERIFFMUIR

Lorna Main

Wallace's Stone stands 1.8 m tall above the surrounding peat on the Sheriff Muir, an apparently lone sentinel commemorating a battle long past and remembered only in its name. Unfortunately, the traditional association of the stone and a Wallace encounter with English forces has been discounted. And although the stone is now the only stone on Lairhill still actually standing it is not alone. It is in fact the second stone in a row of five stones, the others long toppled over and partially hidden in the ground, which is aligned approximately north east to south west.

The stones are not mapped on the Roy map of Scotland (1747-55) nor on Stobie's map of the Counties of Perth and Clackmannan, published in 1783. Their first appearance is the depiction of the Wallace Stone on the First Edition Ordnance Survey 6-inch map of 1866. By this time it would appear that this was the only stone still standing although it is mapped a little to the south west of the stone now marked as Wallace's Stone on modern maps. (NGR NN 83255 02297)

Alignments of standing stones are known from all over Britain and elsewhere, most famously in Scotland at Callanish on the Isle of Lewis. The stones on Sheriffmuir are the only known such row in the Stirling area. Such alignments are thought to date to the late Neolithic or Early Bronze Age, perhaps around five thousand years ago. This date is further confirmed here at Lairhill by the carving on the very southernmost stone of around 20 cup marks, many now weathered. Such carvings are also widespread, and are found alone or as part of more complex carvings with rings and other symbols. They were carved on the living rock, on boulders and, as here, on standing stones. Some were incorporated into later structures such as burial cists and even brochs.

The alignment of the stones undoubtedly has significance. Perhaps in astronomical terms, perhaps in topographical terms. Some stone rows are aligned on particular celestial events, perhaps with the solstices, or on particular landscape features. Some align on other prehistoric sites. I have not looked to see what the significance at Lairhill might be but the site has fantastic views across the carse to Stirling and beyond and has an atmosphere all of its own.

There are a number of lay-bys on the Sheriffmuir road which give access to the area but it should be noted that the stones are located on private land and sheep are often grazed in the surrounding fields. Appropriate care and courtesy should be observed if visiting the site. Additionally, the stones and the area around them are scheduled as an ancient monument of national importance and restrictions on certain activities apply, including the use of metal detectors.



Figure 1 Wallace's Stone, Lairhill, Sheriffmuir.

THE GREAT WATER-WHEEL OF BLAIR DRUMMOND (1787-1839)

Ken Mackay

The Carse of Stirling, when first surveyed by W. Winter in 1754, consisted of 2000 ‘useless’ acres of ‘The Great Moss of Kincardine’ and ‘The Drip Moss’, surrounded by small, tenanted farms lying between the Mosses and the Rivers Teith or Forth.

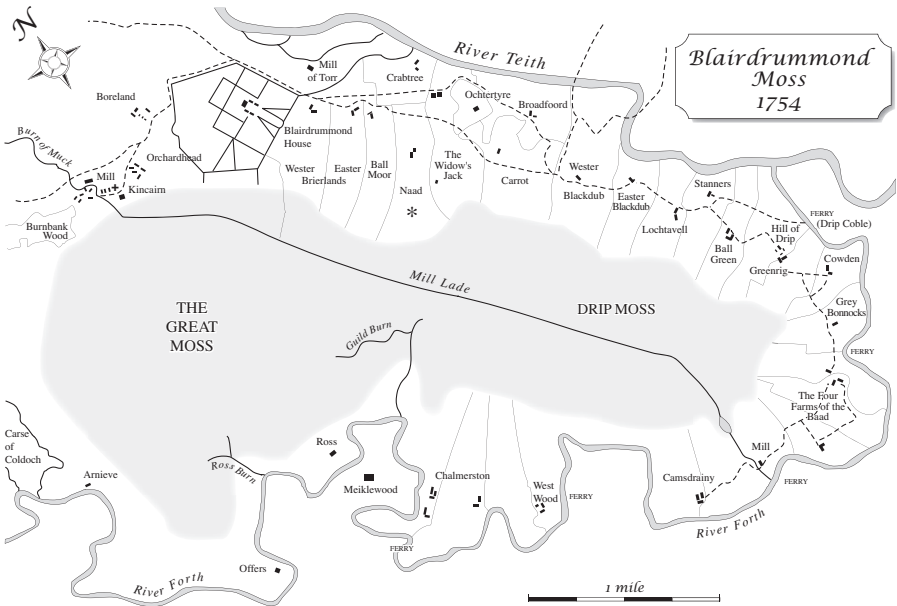


Figure 1 Blair Drummond Moss, 1754, as surveyed by W. Winter.

In 1766, the 5000 acre Blair Drummond Estate passed rather unexpectedly to Agatha Drummond whose husband, Lord Kames, was one of Scotland’s most outstanding innovators. The Estate included most of the land between the Forth and the Teith, around the compact 650 acre Estate of Ochtertyre, the property of John Ramsay (1736-1814).

Lord Kames proposed to remove the peat (up to 10 feet deep) so gaining access to the fertile soil beneath. He let the land in 10 acre blocks each with a ditch carrying flowing water. Each tenant would cut cubic blocks of peat and cast them into the ditch, and so float them to the sea. Tenants were instructed to construct peat-walled cottages within the depth of the Moss.

The first land to be allocated was in the District of Drip Moss (started in 1767), followed by Nailor’s Lane from 1774. By the time of Lord Kames’s death

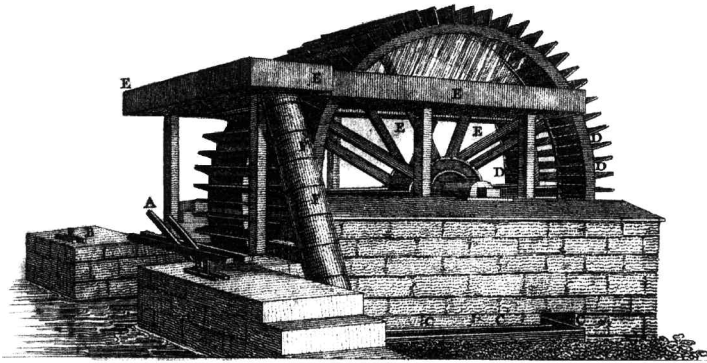
in 1782, 336 acres had been let to 43 tenants, and – assuming each cleared a quarter-acre per year - perhaps 80 acres in total had been cleared. If the scheme was to succeed, many more tenants must be attracted, a network of access-roads would be needed, and most of all, a larger and more reliable water supply must be provided.



Figure 2 Portrait of George Home Drummond, son of Lord Kames, and instigator of 'The Great Wheel'.

George Home Drummond, Lord Kames's son, took over in 1783, and commenced by constructing an extended road-network around (and in places through) the Moss. He sought advice from practical engineers on how to bring in water supplies. Whitworth suggested a steam pump, but it was George Meikle of Alloa who came up with a one-sixth scale working model of a water-powered lift; the force of the strongly flowing River Teith would rotate a water-wheel with small upward-facing buckets on the inside of the wheel. These would discharge into a shaped trough at the highest point in the rotation. The working demonstration delighted both Home Drummond and Whitworth, and the full-scale model was duly commissioned. A contract was entered into with Mr Meikle in spring 1787, and by the end of October in that year the wheel, pipes and aqueduct were all completely finished. Its wheel was 28 feet in overall diameter, and 10 feet in width and cost £1000 to build. In action, it rotated four times per minute and raised 40 hogsheads (250 gallons) of water to a height of 17 feet in this time. 'Upon trial the effect answered their most sanguine expectations.'

SKETCH OF THE WHEEL FOR RAISING WATER AT BLAIR DRUMMOND



SKETCH OF THE CISTERN AS SEEN FROM ABOVE



Sketch of the manner in which the Water is filled from the Troughs into the Buckets

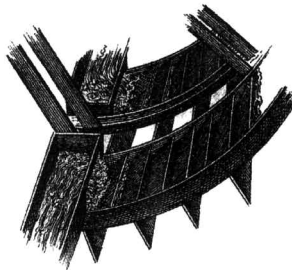


Figure 3 Sketch of the Wheel for raising water at Blair Drummond.

The working prototype constructed by Meikle has been preserved by the successive owners of Blair Drummond and is now an exhibit in the Scottish Museum of Country Life, at East Kitchside, East Kilbride.

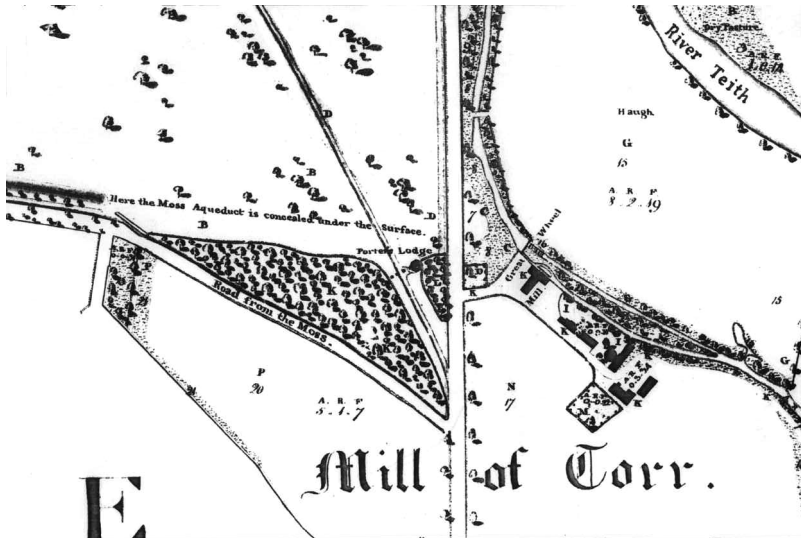


Figure 4 Detail of site of Great Wheel, from survey of Blair Drummond by W. Kyle in 1805.

The site of the Great Wheel was close to the Mill of Torr, one of the estate corn-mills. Water from the upper trough passed into a wooden pipe of 18 inches internal diameter and 354 yards in length, forming an inverted syphon to carry the water under 'the King's Highway from Stirling to Down (Doune)' which passed close by. It then joined an aqueduct 1400 yards long and about 10 feet above the level of the Carse, which carried the water by gravitation to the centre of the sphere of operations (by day) or to a storage reservoir by night.

From the first commissioning of the Wheel in 1787 until its final dismantling in 1839, it had only required two periods of repair, and had been instrumental in recovering more than fifteen hundred acres of high-valued farmland.

Acknowledgements

I wish to record my gratitude to Lady Muir and her late husband Sir John Muir for permitting me to study their Estate Plans over a number of months. I should also like to acknowledge useful discussions with Doreen Hunter and Monica Clough, both of whom are sadly no longer with us.

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I should also like to thank Bill Jamieson, University Cartographer, for preparing the map of Blair Drummond Moss (Figure 1).

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