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Stirling Castle

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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.

Since then the organisation of an annual environment/heritage symposium called *Man and the Landscape* has been an important feature.

The annual *Forth Naturalist and Historian* has 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.

In addition a 230 page book *Central Scotland – Land, Wildlife, People*, a natural history and heritage survey, was produced in 1994 and is available 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. **Visit website for instructions to authors.**

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BROWNFIELD BIODIVERSITY IN FALKIRK

Suzanne Bairner and Craig Macadam

The industrial revolution in Britain during the 18th Century transformed the scenery of our towns and countryside. In Central Scotland, Falkirk was at its heart and many heavy engineering works and iron foundries were based there. With the demise of these industries across Falkirk, their former premises have been left derelict. Many of these ex-industrial sites have since been reclaimed by nature through natural succession.

Brownfields are any site that have been altered by human activity and are currently not fully in use (CABE, 2006). They tend to be concentrated in urban and former industrial landscapes but also include quarries, spoil heaps, old railway lines and disused airfields (Allan *et al.* 1997; Bodsworth *et al.* 2005; Whitehouse, 2008; Riding *et al.* 2010). Brownfield sites provide linkages or 'stepping stones' between more natural areas of habitat and facilitate the movement and mixing of species in a less favourable urban setting. There are at least 700 active and disused quarries which have been notified as Sites of Special Scientific Interest (SSSI) in Britain for their biological and geological interest (Bodsworth *et al.* 2005).

Lack of management of brownfields often creates an open mosaic of habitats with species rich grassland, bare ground and early successional habitats (Key, 2000; Bodsworth *et al.* 2005; Harvey *et al.* 2008). This, combined with a low nutrient content of the soil that prevents fast growing plant species becoming dominant, provides a continuity of resources for invertebrates throughout the season (Harvey *et al.* 2008). In addition, a mosaic of habitats can provide a home for a wide range of invertebrates and allows many to complete their life cycles within the same site (Bodsworth *et al.* 2005).

It has long been recognised that brownfields may have as many associated Red Data Book (RDB) and Nationally Scarce invertebrate species as ancient woodlands. Between 12-15 % of nationally rare and scarce insects have been recorded from Britain's brownfields and it is thought that this is an underestimate (Gibson, 1998). The lack of management of brownfield sites often provides a secure area for breeding birds such as skylark (*Alauda arvensis*) and grey partridge (*Perdix perdix*), that are often absent from land under agricultural management.

Many features identified at long abandoned industrial sites can no longer be found in the managed and over-farmed wider countryside or even in over-tidied parks (Bodsworth *et al.* 2005). Loss of natural habitat is causing many species, including bumblebees, beetles, butterflies and reptiles, to become increasingly dependent and reliant on brownfield sites.

Despite their potential to support biodiversity a strong negative public image has been attached to brownfields due to lack of management and a perceived untidiness and they are increasingly threatened by development and landscaping (Key, 2000; Riding *et al.* 2010). Restoration of post-industrial sites into greenspace can destroy much of the existing wildlife interest through the importation of large quantities of topsoil and tree planting. Site restoration can also result in the loss of particular niches at brownfields which will have a knock on effect on the wildlife found there (Bodsworth *et al.* 2005). For example, the loss of bare ground at a site will affect thermophilic (warmth-loving) invertebrate species such as spiders and ground beetles as well as species such as mining bees and solitary wasps that nest in the ground (Key, 2000; English Nature, 2005; Whitehouse, 2008).

The conservation of brownfield sites has lagged behind other important habitats for plants and wildlife. The term brownfield was first used by the government in 1998 when they set a national target of 60 % of all new housing developments to be located on brownfield land (Bodsworth *et al.* 2005; Riding *et al.* 2010). This resulted in a conflict between objectives set for sustainable development and the conservation of wildlife.

In 2007 the priority habitat *Open Mosaic Habitat on Previously Developed Land* was added to the list of UK Biodiversity Action Plan (Maddock, 2008; Riding *et al.* 2010). Brownfields have also featured in the Falkirk Area Biodiversity Action Plan (FABAP) as part of the action plans for Urban Greenspace and Bings (Perks, 2006).

There is no local biological records centre for Falkirk and little or no surveys of invertebrate at brownfields have occurred within this area.

Sites from Falkirk Council's vacant and derelict land register are scattered within villages and towns including Banknock, Denny, Larbert, Falkirk, Grangemouth and Bo'ness. Each village and town visited had sites that were potentially important for invertebrates however Banknock, Bo'ness and Larbert all had sites that were particularly important for other plants and animals.

Of the 76 sites in the 2007 register of vacant and derelict land in Falkirk, habitat assessments were undertaken at 62 of them (Table 1).

Table 1. Habitat assessments completed on sites from the Falkirk vacant and derelict land register from 2007.

Sites	Number
Assessment done	62
Access not granted	4
Recently developed	7
Not visited	3

From the 62 sites visited, 19 were originally chosen as being potentially important for invertebrates as these sites fitted the criteria of Open Mosaic Habitat (OMH) (Maddock, 2008; Riding *et al.* 2010).

To fit OMH criteria the site must be over 0.25 hectares in size and have a known history of disturbance. There must also be a mosaic of vegetation on the site comprised of early successional communities and un-vegetated bare areas (Table 2).

Table 2. Open mosaic habitat on previously developed land definition and criteria (Riding *et al.* 2010).

	Criteria
1.	The area of open mosaic habitat is at least 0.25 ha in size.
2.	Known history of disturbance at the site or evidence that soil has been removed or severely modified by previous use(s) of the site. Extraneous materials/substrata such as industrial spoil may have been added.
3.	The site contains some vegetation. This will comprise early successional communities consisting mainly of stress tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of a) annuals or b) mosses/liverworts or c) lichens or d) ruderals or e) inundation species or f) open grassland or g) flower rich grassland or h) heathland.
4.	The site contains un-vegetated, loose bare substrata and pools may be present.
5.	The site shows spatial variation, forming a mosaic of one or more of the early successional communities a) – h) above (criterion 3) plus bare substrata, within 0.25 ha.

The remaining sites on the register were not selected as being important for invertebrates and are not reported here. Of the 76 sites, 18 were less than 0.25 hectares and after habitat assessments were completed it was established that 27 sites were not brownfields.

Of the 19 brownfields fitting the criteria for OMH from the vacant and derelict land register (Riding *et al.* 2010), 14 were sampled for invertebrates. Invertebrate survey work was also undertaken at Roughcastle (NS845795) and Garibaldi Bing (NS900843). Although these sites are not on Falkirk's vacant and derelict land register they have been previously recognised as sites with OMH. The remaining five sites from the register fitting the OMH criteria were visited for assessment purposes but no invertebrate survey work was possible due to access restrictions (Table 3).

Table 3. Sites with OMH from the vacant and derelict land register that were not sampled for invertebrates.

Site name & Code	Size (hectares)	Grid reference	Vacant/ Derelict	Estimated invertebrate abundance
Bellsdyke Road A F/LARB/046	0.45	NS87548405	Derelict	Medium
Bonnyside Works F/BONY/066	6.06	NS83647938	Derelict	Medium
Etna Road F/FALK/084	2.74	NS89168213	Derelict & buildings	Unknown
Roughcastle A F/FALK/091	1.95	NS84637964	Derelict & buildings	Low
Stirling Street B HF/DENY/005	2.07	NS81348310	Vacant	Low

Wildlife surveys of brownfield sites in Falkirk commenced in May 2010, with the majority of field work carried out between June to October 2010 and March to June 2011. This paper provides details of the brownfield sites sampled in Falkirk with notes on some of the species recorded.

Exercise Methodology

A desk exercise was undertaken in May 2010 to establish the location of sites from Falkirk's vacant and derelict land register. A spreadsheet supplied information for each site on the register, including site code, name, size, type (whether it was derelict land and/or buildings), together with grid co-ordinates as eastings and northings.

Icons for each site were labeled with a code and plotted into Google Earth. Boundaries of each site were used to determine the extent of each area.

The information taken from Google images was recorded on the spreadsheet for each site, including, the date of the aerial photograph as some Google images are over ten years old. Other information recorded for each site included whether the site had been recently developed, if the site was landscaped, lacked vegetation, had late successional vegetation or was agricultural land. If this information was not easily established from the aerial photograph Google Earth street view was consulted.

Habitat Assessment Methodology

An assessment of the habitat on each of the 76 sites in the vacant and derelict land register was undertaken during May 2010. Details of each site were recorded using Buglife's brownfield habitat assessment form and included current activity, the vegetation type, plant species diversity and abundance. Photographs were taken on each site for future reference.

Species of wild flower, shrub and tree observed at each site were recorded using a field guide; if identification was not possible in the field a photograph was taken or a specimen taken for later identification.

Potential invertebrate species diversity was estimated as low, medium or high for each site based on plant abundance and plant species diversity on the site as well as the presence of a mosaic of habitats, including bare ground, scrub and mixed grassland and herbs.

Invertebrate Sampling Methodology

Samples of terrestrial invertebrates were collected using pitfall traps, sweep nets and/or pan traps. When collected each sample was labeled with site name, collection method and date and stored in 70 % alcohol. Samples were first sorted into different invertebrate orders and then identified to family, genus or species by close examination under a high power microscope with reference to taxonomic books and keys.

Most invertebrate groups were identified to species, however in the Diptera, Myriapoda, Acari, Collembola and Mollusca a lower taxonomic precision was used in some cases.

Pitfall trap

Pitfall traps comprise of two plastic cups, one inside the other, sunk into the ground. In the bottom of the outer cup several small holes were made using a soldering iron or other tool. These holes provide drainage and allow the inner cup to rise if the ground becomes particularly wet. Two small holes (~3 mm) under the rim of the inner cup allow rainwater to drain if the trap becomes filled with water. It is important that the trap is flush with the surface and that the cups do not protrude.

When setting the traps 3 cm of liquid containing 50 % water 50 % antifreeze (ethyl glycol) and a dash of washing up liquid (to break the surface tension) were poured into each trap to kill any invertebrates that fall in. A square of chicken wire was placed over the trap and pegged down with wire hooks or tent pegs to stop mammals, amphibians and reptiles falling into the traps.

At least five traps were placed on areas of bare ground and/or short species rich grassland either in a straight line at 2 m spacing or a 1 m grid depending on the habitat. Most of the traps were left for up to 2 weeks before they were emptied. The contents of the traps from each site were pooled on each trapping date.

Sweep netting

A sweep net was used to collect invertebrates from vegetation. The net was swept over vegetation in a figure of eight for one minute in a transect across

the site. A pooter was used to transfer the collected invertebrates from the sweep net to a small plastic pot with 70 % alcohol to be sorted later.

Pan traps

Bright yellow pan traps were placed at two sites to collect pollinators including Hymenoptera, Diptera and Coleoptera. About 1 cm of water mixed with washing up liquid to reduce the surface tension was poured into the trap and left for 1-2 weeks. When the traps were collected, invertebrates were sieved into a plastic pot to be sorted later.

Results

Where two sites were adjacent to each other, information on their history, habitat assessment, plant diversity (high, medium or low), estimated invertebrate abundance and species have been combined.

South Bridge Street (2 sites)

21/25 South Bridge Street

Site Code: F/GRAN/015

Size: 0.43 hectares

Grid Reference: NS92298236

Ex-Timber Basin

Site Code: F/GRAN/014

Size: 3.56 hectares

Grid Reference: NS92288218

Vacant/Derelict: Vacant land and buildings

Dates surveyed: 18/06/2010, 09/08/2010 and 30/08/2010

Plant diversity: Medium

Estimated invertebrate abundance: Medium

South Bridge Street in Grangemouth is composed of two sites. The smaller site (F/GRAN/015) has bare ground comprising broken up concrete as well as mixed herb and grassland with some trees and scrub around the edges. Derelict buildings within this area have recently been demolished and rubble still lies scattered around the site. The larger site (F/GRAN/014) is an infilled timber basin that fell out of use during the mid 20th Century. Water levels were controlled at the timber basin through a lock that connected the site to a man made water body on the east of South Bridge Street. The site is now a large meadow mostly composed of tall grasses with some scrubland of gorse (*Ulex europaeus*).

There is little evidence of use by people although there is small scale fly-tipping and there are some tyres on site.

There is an interesting diversity of wildflowers across the two sites.

Invertebrate samples were collected by sweep nets and recorded through direct observation. The ant species *Formica lemani* and *Myrmica scabrinodis* and ringlet butterfly (*Aphantopus hyperantus*) were recorded.

Bankier Road

Site Code: F/BONY/007

Size: 0.83 hectares

Grid Reference: NS77957894

Vacant/Derelict: Derelict land

Dates surveyed: 17/05/2010 and 28/07/2010

Plant diversity: Low

Estimated invertebrate abundance: Low

This site is to the east of Wellpark Road in Banknock and is mostly late successional vegetation and scrub with areas of open mixed herb and grassland. A stream runs along the north of the site and there are two graveled pathways that pass through the site, one to the north and another to the south. A small building was on the site during the mid 19th Century and increased in size after 1899. The building has since been demolished, possibly during the last 30 years. The site is east of the Distillery Site (HF/BONY/008).

This site has an interesting diversity of wildflowers including raspberry (*Rubus idaeus*), eyebright (*Euphrasia nemorosa*) and common spotted orchid (*Dactylorhiza fuschii*). The site was sampled for invertebrates using sweep nets and by direct observation. Red soldier beetles (*Rhagonycha fulva*) are commonly seen on cow parsley (*Anthriscus sylvestris*) which is scattered across the site.

Bathgate Road

Site Code: HF/POLM/057

Size: 1.13 hectares

Grid Reference: NS90837918

Vacant/Derelict: Vacant land

Dates surveyed: 10/06/2010 and 09/08/2010

Plant diversity: Medium

Estimated invertebrate abundance: Medium

Bathgate Road in Laurieston is between the main road Redding Road and is close to Callender Estate. The site has some late successional vegetation present around the site edges and a meadow of mixed herb and grassland lies in the central area. This is an old brownfield site that has been completely reclaimed by nature. There appears to be little human activity at the site although small scale fly-tipping occurs.

Birds may use the trees and scrub to nest and/or roost in and blue tit (*Cyanistes caeruleus*) and house sparrow (*Passer domesticus*) have been observed feeding here. The garden escapee Spanish bluebell (*Hyacinthoides hispanica*) has

also been recorded. The site was sampled for invertebrates using sweep nets and through direct observation.

Bing

Site Code: F/FALK/081

Size: 2.9 hectares

Grid Reference: NS89058146

Vacant/Derelict: Derelict land

Dates surveyed: 08/06/2010 and 28/10/2010, and continuous from 12/04/2011 to 20/06/2011

Plant diversity: Medium

Estimated invertebrate abundance: Medium

Located to the east of Mungalend Court and north of the Forth and Clyde Canal in Falkirk the bing was in operation from the late 19th Century up until the late 20th Century and today has bare ground, scrub, mixed herb and grassland and scattered trees. Part of the site highlighted in the vacant and derelict land register is an area of flattened rubble which may have once been used as a car park by local industry. The area has slopes of varying size and steepness that lead up to and across the bing. Small scale fly-tipping occurs with areas of dumped tyres.

The bing that makes up most of the site has previously been highlighted as a wildlife site owing to the diversity of plants, including common fumitory (*Fumaria officinalis*), dames violet (*Hesperis matronalis*) and oxeye daisy (*Leucanthemum vulgare*). There is a small patch of Japanese knotweed (*Fallopia japonica*) on the site. Invertebrates have been sampled through collection by pitfall trap and sweep net and also through direct observation. The site is good for the wolf spiders (*Trochosa ruricola* and *Alopecosa pulverulenta*) and ground beetles (*Loricera pilicornis* and *Carabus nemoralis*).

Bridgeness Road (2 sites)

Bridgeness Road

Site Code: F/BNES/032

Size: 0.77 hectares

Grid Reference: NT01358164

Vacant/Derelict: Vacant land

Bridgeness Scrap Yard

Site Code: F/BNES/053

Size: 1.83 hectares

Grid Reference: NT01428170

Vacant/Derelict: Derelict land

Dates surveyed: Continuous from 01/06/2010 to 23/05/2011

Plant diversity: Medium-High

Estimated invertebrate abundance: Medium

The two adjacent sites north of Bridgeness Road near Carriden, Bo'ness have large areas of bare ground as well as mixed herb and grassland, scrub and open late successional vegetation.

A building from the mid 20th Century has since been demolished and rubble is scattered across the site. A harbour to the east of the site boundary which supplied access to local industry has been in-filled.

A well used path runs down the west of both sites and through woodland at the very east of the site. A graveled road runs between the two sites and through the central area of the old scrap yard running north to south. There are tidal flood defences along the north of the site protecting it from the river Forth. The site has had problems with fly-tipping and a gate has now been placed at the main entrance on Piers Road; tyres that were once in woodland to the east have been removed by Falkirk Council.

There is a high diversity of wildflowers across the two sites and 82 species of wildflower have been recorded so far including broad leaved helleborine orchid (*Epipactis helleborine*), bladder campion (*Silene vulgaris*) and St. John's wort (*Hypericum perforatum*).

The site was sampled for invertebrates using pitfall traps and sweep nets as well as by direct observation. Results from both sites were combined. The site is particularly important for pollinators such as hoverflies including *Melanostoma mellinum* and *Syrphus ribesii* and bumblebees such as white tailed (*Bombus lucorum*) and red tailed (*B. lapidarius*). The sites are also important for butterflies including small copper (*Lycaena phlaeas*) and the Falkirk Area Biodiversity Action Plan priority species common blue butterfly (*Polyommatus icarus*).

The hobo spider (*Tegenaria agrestis*) was recorded here. This has previously been recorded from only five sites in Scotland. Specimens were collected from pitfall traps and several individuals were seen under stones across the site.

Banknock Colliery (2 sites)

Cannerton Brickworks

Site Code: F/BONY/010

Size: 5.17 hectares

Grid Reference: NS78237965

Cannerton Brickworks A

Site Code: F/BONY/059

Size: 1.21 hectares

Grid Reference: NS78287954

Vacant/Derelict: Derelict land and buildings

Dates surveyed: 17/05/2010 and 28/07/2010

Plant diversity: Medium

Estimated invertebrate abundance: Medium

Historically, Cannerton Brickworks in Banknock was known as Banknock Colliery. The site was developed during the late 19th Century and a pit used by industry was in operation from the early 1920s. The site has only recently gone out of use and the buildings demolished. A derelict building remains on part of the site. The site along with neighbouring sites on the vacant and derelict land register has been earmarked for a large housing and hotel development.

Banknock colliery is north of Kilsyth Road and has a large flat area with an area of OMH of bare ground and mixed herb and grassland with some scrub around its edges. Below this flat area there is a slope that is densely covered in silver birch.

Both sites within the colliery were sampled for invertebrates using direct observation and sweep nets and samples collected were marked as Cannerton Brickworks. Invertebrates collected at the site include the soldier beetle *Cantharis figurata* and the ant *Formica lemni*.

Carron Works (Forge Dam)

Site Code: F/LARB/044

Size: 2.53 hectares

Grid Reference: NS88028251

Vacant/Derelict: Vacant land

Dates surveyed: Continuous from May 2010 to June 2011

Plant diversity: High

Estimated invertebrate abundance: High

Carron Works in Stenhousemuir is adjacent to the Carron Dams SSSI that is owned by Falkirk Council and managed by Scottish Wildlife Trust. Industrial activity at this site first occurred during the late 18th Century and a building on site connected with industrial activity to the east of Carron Works was demolished between 1982 and 1992. Railway lines used to run through the site to service the Carron Iron Works but have since been removed. Industrial activity at Carron works to the east of this site continues today.

Carron Works has areas of OMH with open bare ground, scrub, mixed herb and grassland and woodland. Large mounds of rubble that include both soil and bricks are at the north of the site where bare ground dominates. The mixed herb and grassland meadow are at the east of the site and young silver birch woodland dominates the south and part of the west of the site.

This site has a particularly high diversity of wildflowers including viper's bugloss (*Echium vulgare*), common centaury (*Centaurium erythraea*), northern marsh orchid (*Dactylorhiza purpurella*) and St. John's wort (*Hypericum perforatum*).

Invertebrate diversity is also high. The fauna was sampled by pitfall trapping, sweep netting, pan trap as well as through direct observations. The rare and scarce species *Andrena ruficrus* (RDB3), *Amara praetermissa* (Nationally Scarce Notable B species), *Tegenaria agrestis* and *Anelosimus vittatus* were all collected at this site.

Distillery Site

Site Code: HF/BONY/008

Size: 3.96 hectares

Grid Reference: NS77817892

Vacant/Derelict: Derelict land

Dates surveyed: 17/05/2010 and 28/07/2010

Plant diversity: Medium

Estimated invertebrate abundance: Medium

This large OMH site to the west of Wellpark Road in Banknock has late successional vegetation, mixed herb and grassland, bare ground comprising broken up concrete and scrub. The site was a distillery that was in use from at least the mid 19th Century onwards. The site was demolished during the last 20 years.

A small stream runs along the north side of the site and graveled pathways run alongside this and to the south of the site. There are piles of rubble close to the area of broken up concrete and an old wall runs through the site. It was reported by a local dog walker that roe deer (*Capreolus capreolus*) are regularly seen on the site, although they were not observed during visits to the site.

The FABAP priority species harebell (*Campanula rotundifolia*) and oxeye daisy were both recorded at the site along with the garden escape fox and cubs (*Pilosella aurantiaca*). Invertebrates were recorded at this site through sweep netting and direct observations.

Industrial Estate

Site Code: F/FALK/044

Size: 9.7 hectares

Grid Reference: NS86257999

Vacant/Derelict: Vacant land

Dates surveyed: 20/05/2010 and 23/06/2010

Plant diversity: High

Estimated invertebrate abundance: High

This site is east of the Falkirk Wheel in Tamfourhill and is composed mostly of mixed herb and grassland with some scrub and several trees scattered across the site especially towards the site edges. The Forth and Clyde canal runs along the north side of the site. During the 1940s the site was completely covered by industrial buildings that have been gradually demolished during the last 20 years and today industrial buildings only lie to the south and west of the site.

There is a very high diversity of wildflowers at this site. The site is rich with buttercups (*Ranunculus* spp.). Furrows in the ground run across the site and provide dark and damp habitats for invertebrates.

Invertebrates were collected by sweep netting and also observed by direct observations. The site is extremely important for pollinators such as the hoverflies *Melanostoma scalare* and *Platycheirus clypeatus*, and the common carder bee (*Bombus pascuorum*). Other invertebrates recorded at the site include the common blue damselfly (*Enallagma cyathigerum*) and garden orb spider (*Araneus diadematus*).

Park Garages

Site Code: F/BONY/065

Size: 0.43 hectares

Grid Reference: NS80237971

Vacant/Derelict: Vacant land and buildings

Dates surveyed: 17/05/2010 and 28/07/2010

Plant diversity: Low to medium

Estimated invertebrate abundance: Medium

A garage situated to the south of this site was demolished about 20-30 years ago. This site is north of Glasgow Road in Banknock and has OMH with lots of bare ground at the front of the site and dense scrubland with bramble (*Rubus fruticosus*) and common nettle (*Urtica dioica*) to the rear of the site. Mixed herb and grassland is more central with yarrow (*Achillea millefolium*), mugwort (*Artemisia vulgaris*) and tufted vetch (*Vicia cracca*) scattered across the site and there are also some scattered young silver birch trees within the central area. There is currently no activity on site and tall fencing surrounds the site to prevent access. There is some Japanese knotweed on the site.

Invertebrates were collected by sweep nets and also recorded through direct observations. The small tortoiseshell (*Aglais urticae*) and ringlet butterfly (*Aphantopus hyperantus*) and the plant bug *Calocoris roseomaculatus* were recorded at the site.

West Mains Industrial Est. B

Site Code: F/GRAN/041

Size: 0.91 hectares

Grid Reference: NS91058122

Vacant/Derelict: Vacant land

Dates surveyed: 18/06/2010 and 09/08/2010

Plant diversity: Medium

Estimated invertebrate abundance: Medium to high

This site is in Grangemouth and is mostly mixed herb and tall grassland with some scrub around the edges and with a few scattered trees. Furrows of earth across the site could provide dark and damp habitats for invertebrates.

The site is surrounded by industry and close to West Mains Industrial Estate (F/GRAN/038) which is mostly tall grassland with little plant diversity. The historical background of the site is not known.

Invertebrates were recorded at this site by collection with sweep net and direct observations and include the species six-spot burnet moth (*Zygaena filipendulae*) and common blue damselfly.

Other brownfield sites with OMH that are not in Falkirk's vacant and derelict land register:

Garibaldi Bing

Site Code: N5900843

Size: 3.7 hectares

Grid Reference: NS900843

Dates surveyed: Continuous from May 2010 to June 2011

Garibaldi Bing is an old colliery Bing and forms a raised plateau around the surrounding farm land. The site is located near Carronshore and the M9 in Falkirk. The only access is from the west along a farm track from the minor road between Cuttyfield Farm and Carronshore. This farm track then accesses the south-west of the site across a bridge over the M9.

Various lichens and moss species dominate the plateau as well as rosebay willowherb (*Chamerion angustifolium*) and bramble. The entrance of the site is sheltered and nutrient rich and plants such as thistles (*Cirsium* sp.), red bartsia (*Odontites vernus*) and common nettle dominate.

Invertebrate surveys have been ongoing at this site for over 10 years. Current survey work has identified that it is particularly important for ground beetles such as *Pterostichus madidus*, *Nebria brevicollis* and *Calathus fuscipes* and for ants, *Formica lemni*, *Lasius niger* agg., *Myrmica sabuleti* and *M. ruginodis*. Other invertebrate species recorded include mottled grasshoppers (*Myrmeleotettix maculatus*) and comma butterfly (*Polygonia c-album*).

The FABAP priority birds, yellowhammer (*Emberiza citrinella*) and skylark (*Alauda arvensis*) overwinter on the site.

Roughcastle

Site Code: NS845795

Size: 32.64 hectares

Grid Reference: CNS845795

Dates surveyed: Continuous from May 2010 to May 2011

Roughcastle is located between the Falkirk Wheel (to the east) and the Roman Antonine Wall (to the west). The site is approximately 1 mile to the west of central Falkirk and skirts the residential area of Tamfourhill.

The Roman Antonine Wall built in the 2nd Century AD is a scheduled monument recognised as a World Heritage Site and is protected under the Ancient Monuments and Archaeological Areas Act 1979. The wall is about 37 miles in length from Bo'ness to Old Kilpatrick and passes through woodland within Roughcastle. The presence of the Antonine wall in Roughcastle gives the area its heritage value.

Mineral extraction works were carried out within Roughcastle from at least 1855 but all ironstone shaft pits were out of use by 1897. A fish oil and guano works was operating from 1916 at the south-west boundary of Roughcastle. There is currently no industrial activity within Roughcastle.

The site is important for flocks of overwintering small birds including goldcrest (*Regulus regulus*) and coal tit (*Periparus ater*). Great spotted woodpecker (*Dendrocopos major*) and jay (*Garrulus glandarius*) have also been recorded at the site.

Areas of bare ground on the site are particularly important for ground beetles including green tiger beetle (*Cicindela campestris*) and violet ground beetle (*Carabus violaceus*) and also ground spiders (*Haplodrassus signifer*) and wolf spiders (*Pardosa palustris*). The meadows are important for pollinators including hoverflies such as *Sphaerophoria interrupta*, bumblebees including buff tailed bumblebee (*Bombus terrestris*) and early bumblebee (*B. pratorum*). Butterflies including the UKBAP small heath (*Coenonympha pamphilus*) and FABAP common blue butterfly are present.

Discussion

Wildflower diversity was high at many of the sites. Bridgeness Scrap Yard (F/BNES/053) which is 1.83 hectares in size has the highest wildflower diversity with 82 species recorded so far including weld (*Reseda luteola*), ragwort (*Senecio jacobaea*) and rosebay willowherb (*Chamerion angustifolium*) that are typical of brownfields in Falkirk. The site known as the Bing (F/FALK/081) is 2.9 hectares in size and 54 wildflower species have been recorded there so far whereas 21/25 South Bridge Street (F/GRAN/015) which is only 0.43 hectares in size has at least 39 wildflower species. Generalist wildflower species typical of brownfields that were recorded at most sites during survey work included dandelion (*Taraxacum officinale*), hogweed (*Heracleum sphondylium*), meadow buttercup (*Ranunculus acris*), creeping thistle (*Cirsium arvense*), bramble and common nettle.

Several Falkirk Area Biodiversity Action Plan priority species were recorded during survey work including song thrush (*Turdus philomelos*), common frog (*Rana temporaria*) and common blue butterfly (Table 4).

Table 4. Falkirk Area Biodiversity Action Plan priority species recorded on brownfield sites.

Scientific name	Common name
<i>Acrocephalus schoenobaenus</i>	sedge warbler
<i>Alauda arvensis</i>	skylark
<i>Apus apus</i>	swift
<i>Bufo bufo</i>	common toad
<i>Campanula rotundifolia</i>	harebell
<i>Emberiza citrinella</i>	yellowhammer
<i>Emberiza schoeniclus</i>	reed bunting
<i>Falco tinnunculus</i>	kestrel
<i>Hirundo rustica</i>	swallow
<i>Lepus europaeus</i>	brown hare
<i>Leucanthemum vulgare</i>	oxeye daisy
<i>Phyrrula phyrrula</i>	bullfinch
<i>Polyommatus icarus</i>	common blue butterfly
<i>Rana temporaria</i>	common frog
<i>Turdus philomelos</i>	song thrush
<i>Vanellus vanellus</i>	lapwing

There is currently no local biological records centre for Falkirk. To identify species collected during this survey that have not been previously recorded in Falkirk their distribution in Scotland was checked using the NBN gateway.

Of the invertebrate species collected during survey work 129 have not been recorded from the area before. A number of these species are common and widespread in Britain including the green tiger beetle (*Cicindela campestris*) and violet ground beetle (*Carabus violaceus*), the field digger wasp (*Mellinus arvensis*) and marram spider (*Tibellus maritimus*). Results show that 44 of the 68 species of beetle recorded during survey work have not been recorded in Falkirk before. Hemiptera are under recorded across Britain and of the true bugs collected during survey work, 56 of the 71 have not been recorded in Falkirk before. According to the NBN Gateway 7 species of true bug have previously not been recorded in Scotland. No species of Hemiptera collected during this survey are new to Scotland (D. Pryce, pers. comm.). The reason why many species, particularly beetles and true bugs have not previously been recorded from Falkirk can probably be attributed to a historical lack of surveying in the area.

The diversity of invertebrate species collected at sites from the vacant and derelict land register show the importance of brownfields in Falkirk. The brownfield Carron Works (Forge Dam) is particularly important due to the high diversity of plants and wildlife, particularly for the invertebrates that were recorded. Several species collected at Carron Works are classified as being rare, scarce or local in Scotland.

1. The comb-footed spider *Anelosimus vittatus* (Family Theridiidae) is

widespread and common in England and Wales although there are only a few records in Scotland. It has previously not been recorded in Falkirk but during the survey was collected from Carron Works and Roughcastle.

2. The hobo spider (*Tegenaria agrestis*) (Family Agelenidae) is a brownfield specialist and was previously only known from five locations in Scotland (Bo'ness, Grangemouth, two locations in Edinburgh and near Dingwall in the Highlands). During field work the species was recorded in a new 10 km square at Carron Works and was also recorded at Bridgeness Scrap Yard in Bo'ness.

3. The Nationally Scarce (Notable B) ground beetle *Amara praetermissa* (Family Carabidae) was recorded in Bo'ness in the 1980s and during field work three individuals were collected from Carron Works. This represents only the second record of this species in Scotland.

4. The rare (RDB3) solitary bee *Andrena ruficrus* (Family Andreninae) has previously not been recorded from Falkirk and many were seen nesting in bare ground at Carron Works.

5. The leafhopper *Sclerorachus plutonius* is local and scarce in its distribution in Scotland and was collected from Carron Works and Roughcastle.

Several Hemiptera collected during this survey appear to be scarce in Scotland. The Nationally Scarce plant bug *Lygus punctatus* is a Notable B species that was collected at several sites including Garibaldi Bing, Industrial Estate and Park Garages and has previously not been recorded in Falkirk before.

Other wildlife observed including mammals, amphibians, reptiles and birds were also recorded. During the survey work, 48 species of birds were recorded including the UKBAP species lapwing (*Vanellus vanellus*), yellowhammer (*Emberiza citrinella*) and skylark. Bird activity was greatest at Roughcastle with 33 species. Roughcastle is home to a wide diversity of wildlife with the only recordings of common lizard (*Zootoca vivipara*), newts (*Lissotriton* sp.) and mole (*Talpa europaea*) during the survey being found here.

Brownfields are included in Falkirk's Local Biodiversity Action Plan in the Urban Action Plan, and as part of the plan they aim to 'establish the ecological value of brownfield sites within the area and undertake appropriate biodiversity protection and enhancement on at least one site'.

Recommendations made by Bodsworth *et al.* (2005) for the management of brownfield sites to maximise their value for invertebrate conservation include surveying sites to identify their wildlife interest and the protection of sites from development. Bodsworth *et al.* (2005) also recommend the management of bare ground, vegetation structure, floristic diversity and shelter to maintain biodiversity at a site once its value has been identified.

According to Falkirk Councils Local Plan, 47 sites on the vacant and derelict land register are allocated for re-development either through housing (22 sites

including Distillery Site (HF/BONY/008) and Bankier Road (F/BONY/007)) or business and industry (25 sites including Bing and Bridgeness Scrap Yard); development objectives for five sites are unknown and five sites are not allocated for any kind of development.

Open mosaic habitat with varying stages of natural succession is scarce in the over-managed and farmed countryside. In an urban setting brownfields can be used as 'stepping stones' to allow movement and mixing of animals and plants across an area (Macadam, 2011). Due to natural succession at these sites, brownfields are a transitory and if left un-managed they have a typical lifespan of between 15 and 20 years (Key, 2000; Bodsworth *et al.* 2005). This is not necessarily a problem as new brownfield sites are always being created. The transitory nature of these sites means that the extent of this habitat will fluctuate as a result of succession, redevelopment and dereliction. The species that inhabit these sites will colonise and retreat in response to the availability of the habitat in each local authority area however it is important that a series of 'stepping stones' are provided as refugia for these species. These 'stepping stone' sites should be managed to retain the open mosaic of habitats to provide stability for the species that depend upon these habitats.

If properly managed, brownfield sites with high value for biodiversity can not only deliver suitable habitat for many species, but can also transform themselves into wild city spaces full of wildflowers that will attract pollinators and other animals. Such sites are an important part of the habitat network, providing corridors for species to disperse around and through urban areas. Brownfield sites can also provide valuable open spaces for local people and are often seen as being the only truly 'wild' city spaces remaining for the public to enjoy the 'unofficial countryside'. There is great potential to make many of these sites more accessible, safe and enjoyable through imaginative planning and positive management. In many built-up areas, brownfield sites may be the sole natural greenspace available. If properly managed, they could help significantly to reduce the number of areas deficient in accessible open space, and contribute to the delivery of urban green networks. Improving access to green spaces will bring attendant quality of life and health benefits to residents, as well as economic benefits.

The importance of brownfield wildlife in urban areas must be recognised and valued if it is to be protected and managed as a vital component of the townscape. Its long-term survival will depend on the support of the local people who use and value their local environment. Developing opportunities for people to see, enjoy and learn about brownfield invertebrates and wildflowers will help increase awareness and understanding of the value of biodiversity in urban areas.

A complete list of all the invertebrates, wildflowers and other wildlife recorded during the survey is available from the authors at Buglife – The Invertebrate Conservation Trust, Balallan House, 24 Allan Park, Stirling, FK8 2QG.

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2010 MOTH RECORDS FOR STIRLINGSHIRE AND WEST PERTHSHIRE (VICE COUNTIES 86 AND 87)

John T. Knowler

An Annotated Checklist of the Larger Moths of Stirlingshire, West Perthshire and Dunbartonshire (Watsonian vice counties 86, 87 and 99) was published in April 2010. It presented an extensively annotated compilation of historical and recent records of the larger moths of vice counties 86, 87 and 99 as well as their known distribution within the region, their habitat and their food plants (Knowler, 2010). What follows is the first of a planned annual update for Stirlingshire and West Perthshire, the two vice counties that are relevant to this publication, and presents important moth records received in 2010 and early 2011.

The vice counties 86 and 87

Because they are roughly equal in size and their boundaries have been stable for over a hundred years, the 112 Watsonian vice counties devised by Hewett Cottrell Watson have become a basis for biological recording. Modern Stirlingshire is roughly split between vice counties 86 and 87. Vice County 86 includes the local authority area of Falkirk and also encompasses areas of modern East Dunbartonshire west to parts of Milngavie and Mugdock Country Park. Vice County 87 includes the western ends of what historically were the counties Clackmannanshire (now part of Fife) and Perthshire.

2010 and early 2011 moth records

The highlights summarised below are of macro moths which by convention are those moth families in which most species are relatively large. These make up approximately 900 of the approximately 2500 moths species recorded in the UK and are by far the best recorded. Species are considered in the order in which they appear in the *Checklist of Lepidoptera Recorded from the British Isles* (Bradley, 2000).

Goat Moth (*Cossus cossus*)

On 23rd June, the author became familiar with the smell and signs of larval feeding in goat moth-infected birches (*Betula sp.*) in Glen Moriston. Armed with this information, on 29th June he returned to Gartfairn Wood at the south-eastern corner of Loch Lomond where there is anecdotal historical evidence for the species. An oak tree (*Quercus sp.*) was located which was probably infected but this remains to be proven.

Grass Emerald – *Pseudoterpna pruinata*

Records submitted by Nick Cooke in the Spring of 2011 included records for grass emerald caught in Port of Menteith on 29th July 2009 and 15th July 2005.

They are the first records for vice county 87 and validation therefore requires retention of a specimen or the submission of a good quality photograph. Nick did not photograph his specimens and it is to be hoped that he will be able to confirm his records by catching more in 2011. The only confirmed record for the region was one in Buchlyvie in 2002 which although in vc86 is not far from Port of Menteith as the moth flies.

Barred Rivulet (*Perizoma bifaciata*)

A barred rivulet caught in Bardowie (vc86, Stirlingshire but politically East Dunbartonshire) was the first record for the region since 2002. In central Scotland, the species appears to have a largely coastal and estuarine distribution and this individual was the most distant from the Clyde and Forth estuaries of any known record. However, the main foodplant, red bartsia (*Odonites vermus*), is not uncommon on rough ground in the area.

Barred Carpet (*Perizoma taeniata*) (Plate 3)

Two examples of this nationally very scarce moth were caught on 3rd August in a trap placed above a damp wooded gully on the outskirts of Lennoxton. They were the first known records for Stirlingshire, vc86. The species is known to prefer damp wooded dells and gullies, particularly when overlying basic rocks. The author has not identified any basic outcrops at the site and the vegetation is characteristic of acid woodland but perhaps the well known, fossil-rich, Hurler limestone beds which outcrop approximately 2 km away may influence the surface pH.

Oak-tree Pug (*Eupithecia dodoneata*)

Although there are four historical records of oak-tree pug from the Rothamsted trap at Rowardennan on Loch Lomondside, the inconsistency of the records, the lack of vouchers and distance from known populations makes them unreliable. Nevertheless, the species is known to be moving north and an unambiguously identified specimen was recorded in 2008 in the centre of Glasgow. In 2010 the species was definitely recorded in vc86. Four were caught by the author in Milngavie on 19th May, and one on the same day in Mugdock Country Park. Martin Culshaw caught another on 22nd May on the outskirts of Killearn.

Shaded Pug (*Eupithecia subumbrata*)

A shaded pug in a trap, run by David Pickett on Flanders Moss on 18th June, 2010, was the second record for vc87, the first having been of two caught in Glen Finglas in 2009. There are records from vc86 in the 1980s.

Lilac Beauty (*Apeira syringaria*) (Plate 3)

Until 2010, the only known records for lilac beauty from the region were from the woodlands of the eastern and south-eastern shores of Loch Lomond in vc86. However, on 1st July, Jane and Arthur Jones caught one just west of Aberfoyle in vc87 and it has since transpired that Nick Cooke caught one near Port of Menteith, also in vc87, on 8th July 2005.

Round-winged Muslin Moth (*Thumatha senex*)

A round-winged muslin moth in the same trap on Flanders Moss as the shaded pug (above) was the first record for the two vice counties since 1991 when it was also recorded on Flanders Moss.

Red-necked Footman (*Atolmis rubricollis*) (Plate 3)

The red-necked footman is a moth on the move. Skinner (1984) gave its northern limit as Staffordshire but by the 1990s it was reported to be widespread in Dumfriesshire, Kirkcudbrightshire and Wigtownshire. In October 2002 the author found larvae on lichens on fence posts in Loch Ardinning SWT Reserve about 14 km north of Glasgow (Knowler and Mitchell, 2004) and since then the moth has been found at many sites throughout vice counties 86 and 87. Indeed its northern movement continues. In this region, it is strongly but not exclusively associated with lichens on sitka spruce. Freshly emerged adults can be found on vegetation at the edge of plantations. Later, on sunny afternoons, they can be seen swarming around the tops of favoured trees.

Cinnabar (*Tyria jacobaeae*)

Before 2010, the only record of cinnabar in vice counties 86 and 87 was of an adult caught in 1969 in the Rothamsted trap sited in oak woods at Rowardennan on Loch Lomondside. It was assumed to have been a wanderer. In 2010 however records came from near the western and the eastern extremes of the region. Andrew Stephenson found about 50 larvae on ragwort on an industrial site near Larbert, on 22nd June. Most remarkably, however another presumed wandering adult was found in June by William Lindsay on the path to Ptarmigan, high on the slopes of Ben Lomond.

Great Brocade (*Eurois occulta*)

Larvae swept from the catkins of bog myrtle (*Myrica gale*) during March 2007 proved that the great brocade breeds on Flanders Moss. A Robinson trap placed in the same area by David Pickett on 22nd July 2010 attracted five freshly emerged adults of the almost black, resident colour-form. This appears to be the most southerly known breeding population of this nationally scarce moth.

Chamomile Shark (*Cucullia chamomillae*) (Plate 3)

The 24 historical records for chamomile shark in Stirlingshire (vc86) all come from the Falkirk and Stirling areas between 1963 and 1994. However, on the 30th June and 2nd of July 2010, Duncan Davidson investigated roadside patches of foodplant and found larvae at Lauriston near Falkirk and also at three sites in that portion of Fife that falls in vc87, namely Blairhall, Mains of Comrie and Lockshaw Moss. Duncan has also drawn attention to an *Amateur Entomological Society Bulletin* reporting the species in Glasgow so a search of the foodplants in other areas could be rewarding.

Brindled Ochre (*Dasypolia templi*)

A single individual recorded at light near Killearn, Stirlingshire by Martin Culshaw was the first record for the region since 1990.

Pale Pinion (*Lithophane hepatica*) (Plate 3)

Like red-necked footman and slender brindle (see below), the pale pinion is a dramatic example of a moth species that is moving north, perhaps in response to climate change. By 2009 it had been found in several vice counties of central Scotland but it had not been recorded in vice counties 86 and 87. However, the species was added to the Stirlingshire (vc86) list in early 2011 when one was caught in a trap at Mugdock Country Park on 10th April and another was recorded in Lennoxton on 18th April. Note that this species emerges in the autumn, hibernates as an adult and re-emerges in the spring.

Copper Underwing (*Amphipyra pyramidea*)

Copper underwing was highlighted in appendix 1 of the checklist of the larger moths of the region (Knowler, 2010) as a species not yet recorded but to be expected. Like several other species here considered, it is moving north perhaps due to climate change. In 2009, its occurrence was confirmed in Lanarkshire (vc77) and Dunbartonshire (vc99) and the first records for vc86 came in 2010. They comprised a single adult in Milngavie on 5th September and another in Mugdock Country Park on 2nd October. Note that the species is difficult to separate from the closely related svensson's copper underwing (*A. berbera*) which occurs at low density throughout the region, so any record requires careful validation.

Confused (*Apamea furva*)

Confused was included in an appendix of the above checklist of the larger moths of the area (Knowler 2010) because it had not been recorded in the area but might be expected. It is a difficult species to identify unambiguously but photographs taken of a capture made by Helen Dawson at Fallin, near Stirling in July 2010 have been critically examined and are undoubtedly the first acceptable record for the area.

Slender Brindle (*Apamea scolopacina*)

Slender brindle is another species that may be moving north in response to climate change. It appears that prior to 2004 it had not been recorded north of Dumfries and Galloway. In that year however two were caught by the author in a light trap in Mugdock Country Park, 14 km north of Glasgow. In 2005 the species was recorded further north at David Marshall Lodge, Aberfoyle and in a Rothamsted trap at Rowardennan, Loch Lomondside while in Mugdock Country park, fourteen were caught in one overnight trap (Knowler, 2005). The moth is now well established in the area and continues to move north having been caught by D. Pickett at Ashfield near Dunblane in 2008 and by H. Young in Bridge of Allan in 2009 and 2010. The woodland grasses known to be larval foodplants in England, namely wood melick (*Melica uniflora*), wood meadow grass (*Poa nemoralis*) and false brome (*Brachypodium sylvaticum*) are not common in the damp acid woodlands of Stirlingshire and West Perthshire so it would be interesting to discover the foodplants that have supported the range extension of the moth into the area.

Butterbur (*Hydraecia petasitis*)

Although it is principally an inhabitant of the beds of its foodplant in northern England, the range of the butterbur moth does extend north to central Scotland and there are specimens in the collection of C.W. Holmes from North Bantaskine, near Falkirk that were caught in 1966 and 1980. In recent years the species has also been regularly recorded by Mark Cubitt at Linlithgow Bridge in West Lothian (vice county 84) just across the River Avon from its boundary with vice county 86. On 13th August, 2010 he proved that the colony extends into Stirlingshire. Hopefully this finding will stimulate recorders to look for the species in other parts of the vice county. The moth is notoriously sedentary and, even where it is common, it is seldom caught far from its food-plant that confusingly is also called butterbur (*Petasites hybridus*). Indeed, most are caught by placing an actinic trap actually in patches of the food-plant. If greater attention were to be given to areas of food-plant that are locally frequent along river banks and in damp meadows in the region, the species might prove to be more common than current records suggest.

Large Wainscot (*Rhizedra lutosa*)

Most records for large wainscot in vice counties 86 and 87 come from the east of the region; a finding which may reflect the relative scarcity of its foodplant, common reed (*Phragmites australis*) when compared with the abundant reed canary grass (*Phalaris arundinacea*) that chokes many wetland sites in the west of the region. A large wainscot caught by Martin Culshaw near Killearn on 1st September 2010 was the first record west of the Stirling and Falkirk areas since 1984.

Golden Twin-spot (*Chrysodeixes chalcites*) (Plate 3)

Helen Dawson struck gold in December when a golden twin-spot emerged from a pupa that she found in orchids at Dobbies Garden Centre, Stirling. The species is a rare migrant from southern Europe and north Africa largely into southern England. However, it also arrives in the UK as an import in potted plants. Presumably it is as a result of such imports that the species is said to be breeding in one of the biomes in the Eden Project in Cornwall. The orchids in which this pupa was found probably came from a nursery in Netherlands so one wonders if they also have a breeding population far to the north of the moth's normal range.

Marsh Oblique-barred (*Hypenodes humidalis*)

In 1986, Iain Christie recorded marsh oblique-barred as occurring in 'a very extensive and very numerous colony' on Flanders Moss. However, it was only recorded once more before 2010 when on 11th August, ten were found in a single overnight trap set on Flanders Moss by David Pickett.

RECORDING MOTHS IN VC86 AND 87

Moth records should be sent to John T. Knowler, the moth recorder for vice counties 86 and 87 (and 99), he will be very happy to assist those who would like to start moth recording or help with moth identification; particularly if

reasonable quality photographs are sent to john.knowler@ntlworld.com Vice county recorders are responsible for the validation of records received and the author has produced a grading system which indicates those moths for which records are unlikely to be queried and those for which photographic evidence or voucher specimens are required. This can be supplied on request. An Annotated Checklist of the Larger Moths of Stirlingshire, West Perthshire and Dunbartonshire is available from the author at 3 Balfleurs Street, Milngavie, Glasgow, G62 8HW for £6.50 plus £2.00 p. & p. Cheques should be made payable to Glasgow Natural History Society.

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THE RETURN OF THE RED KITE

Michael McDonnell

Few birds rival the red kite or gled (*Milvus milvus*) for beauty and natural grace. Famed for its rusty-red forked tail, long elegant wings and agile flight, the kite is wonderfully adapted for life in our mixed woods and open country. Two hundred years ago red kites were one of Scotland's most widespread birds of prey welcome in towns and villages because they scavenged in the streets, helping to keep them clean. They were very common, breeding not only in the more remote north, but even in the counties as far south as Stirlingshire (Ritchie, 1920).

There are a number of historical references which testify to their local abundance. For instance the Rev. James Lapslie's wonderful account of the wildlife of Campsie Parish in the 1794 Old Statistical Account relates *The soaring glade or kite is native to this district: So common is the glade with us that its various modes of flight are considered as an almanac of the weather, and its note is a symbol of moral conduct. We observe when it soars high in the air it prognosticates good weather* (Lapslie, 1794). Similarly Nimmo's *History of Stirlingshire* first published in 1777 describes how: *A century ago, the golden eagle bred regularly in Campsi ... the goshawk, buzzard, and kite are common and in Strathblane parish, game of all the ordinary sorts is very plentiful, along with the kite"* (Nimmo, 1880). Just a century later the local naturalist Harvie-Brown (1876) when pointing out the reduction in kite numbers drew attention to the fact that *This splendid bird used to breed plentifully in Stirlingshire, more especially among the pinewoods of the hills around Loch Lomond.*



Figure 1. Kite or Gled (a Dunbartonshire example). Ritchie, J. (1920).

In the past, comprehensive and systematic killing on a scale almost unimaginable today was aimed at an array of British wildlife, with many of our most familiar wild birds and animals the targets. Harvie-Brown's surveys of estate vermin records showed *On one Perthshire estate alone, 9,849 weasels and stoats, 4,042 feral cats, 2,517 'hawks', 2,517 crows, 1,239 foxes, 576 ravens, 56 pine martens, 37 eagles, 26 otters and eight polecats were culled in the decade leading up to 1900* (Lovegrove, 2007).

For the red kite the wave of persecution occurred in three phases, with a low level of destruction at first, but increasing steadily through the 17th and 18th centuries to a climax of killing at the height of the 19th-century. This devastation was the result of the widely held belief that kites were responsible for a serious loss of game and livestock and even fish. In fact they pose no threat whatsoever to sporting or agricultural interests but sadly this did not stop them being eradicated in huge numbers.

Vermin Acts

Although general improvements in hygiene during this period had already reduced the numbers of kites around settlements, the first phase of red kite persecution was initiated by early farmers and other rural folk, trying to make a living from the countryside. From about 1530 to 1800, cash bounties could be claimed in many counties for pests on vermin lists. The scheme was often administered by church wardens who rewarded anybody bringing the head of a designated pest. Kites were included because they were considered a major threat to poultry and other livestock. Dixon and Scot (1886) relate that: *Kites were then very numerous here, and even destroyed poultry. The Gaelic name is Clabhan gobhlach nan cearc, or fork [tailed] buzzard of the hens.* Similarly Richie (1920) points out that: *The love of the 'greedy gled' for the poultry yard had much to do with the warfare aimed towards it.*

The red kite has a varied diet consisting of small live prey and carrion but it is a renowned scavenger. Its reputation for taking lambs probably owes much to the fact that they may use sheep wool to adorn their nests. Kites have never been known to kill lambs either in Britain or on the Continent, although they will feed from the carcass of a dead livestock after stronger scavengers have exposed the entrails. They also seek out afterbirths, docked testicles and tails left in the fields. As St. John (1846) pointed out: *"The kite, like all birds who feed much on carrion has a lofty flight and appears to examine the surface of the land for miles and miles, in the hope of detecting some dead sheep or other"*.

Although the level of killing during this period was lower than that which was to follow, the vermin acts of the 16th and 17th centuries laid the foundations for the subsequent extermination of red kites (Lovegrove, 1990).

Victorian Gamekeeping

The period of the most intense persecution of kites and other predators was in the 19th century and was driven by the growth of game shooting. St. John's (1846) account relates that the common perception of kites was that *No greater enemy or more destructive foe to young grouse can exist. Their large and ravenous young require a vast quantity of food and the old birds manage to keep their craving appetite well supplied.*



Figure 2. Victorian red kite, with grouse prey – Perthshire September, 1878 (From Victorian Booth Collection of Taxidermy) Credit: *The Royal Pavilion and Museums, Brighton & Hove archives.*

The increased effectiveness of firearms and the establishment of large shooting estates by rich landowners during this period, combined with new railway networks, ensured that kites were not safe even in Scotland's wildest places. Extreme levels of persecution inevitably followed, with many gamekeepers undertaking this process with more determination than at any other time in history. Mackenzie (1921) in his book *One Hundred Years in the Highlands* points out that there was so much vermin in those days that the so-called gamekeepers were in reality only game-killers and vermin trappers.

Kites were subsequently shot, trapped and poisoned in vast numbers and apparently *a clever trapper seldom failed in consequence of her greedy disposition* (St.

John, 1846). There are several accounts in the 1820s of the wholesale slaughter resulting from horse carcasses being laced with poison and left as bait. For example Mackenzie (1921) relates how: *The vermin consisted of all kinds of beasts and birds, a good many of which are now extinct. The fork-tailed kites swarmed, and I have heard that the first massacre of them that took place was when my father poisoned with strychnine the dead body of a young horse.....The last kite had disappeared before my time.*

According to Baxter and Rintoul (1953) 105 kites were killed in the Callander hills between December 1824 and December 1825 and by 1873 kites in the Balquidder area had become very scarce as a result of ruthless destruction by gamekeepers (Duffy, 2001). The slaughter peaked just before the First World War when many gamekeepers went off to the trenches and never returned. Although persecution continued after the war, the mass slaughter was never as intense.

Egg Collecting and Taxidermy.

As kite numbers continued to fall, the value of their eggs increased as a direct result of their rarity. The vulnerable population became increasingly a target for egg collectors. Shepherds, gamekeepers, and others who were all too aware of the value of eggs were eager to search for them and would be loathed to part with them unless they gained a very high price (St. John, 1891). *Our landowners may prevent illegal bird catching and nest destroying on their lands, and protect certain areas at all events as asylums, where wild birds may nest and rear their young in peace, without fear of disturbance from the egg collector, or those who is always on the lookout for specimens of rare birds and their eggs, of which to make merchandise.* (John, 1897)

Another cause of their virtual extinction was the fondness of the Victorians for killing and stuffing animals for taxidermy, displaying kites in glass cases rather than enjoying them in the wild. Edward Thomas Booth, was one such collector, who founded his museum in 1874. The Booth museum is today the second largest regional natural history museum in Britain, containing his lifetime collection of stuffed British birds. Mr Booth's ambition was to try and capture an example of every single British bird in existence and is believed to have eliminated the last kite nest in Scotland. After shooting the male at the nest and making the female flee, he removed the young, keeping one alive until full size, whereupon he killed it and mounted it as a stuffed specimen (Lovegrove, 1990) In addition to their skins and eggs, the feathers were also much sought after *Up to the year 1879, Messrs Anderson, fishing tackle makers, formerly of Dunkeld, used to obtain one or two kites annually from Perthshire, which they used for fly-dressing* (Harvie-Brown, 1906).

Near Extinction and First Protection

Towards the end of the 19th century concern was mounting amongst ornithologists of the need to protect the few remaining birds. For instance John



Figure 3. Victorian red kite nest scene – Perthshire June 1878 (From Victorian Booth Collection of Taxidermy) Credit: *The Royal Pavilion and Museums, Brighton & Hove archives.*

in 1897 wrote: *The serious diminution in the numbers of our British Wild Birds in recent years, and the actual extinction of many species, in so far as they have ceased to nest in our Islands within the memory of man, has at length aroused public attention to the fact that we are losing many of our useful Wild Birds altogether.* This anxiety is apparent in Harvie-Brown's response to the publication of the location of kite breeding sites at Blair Atholl *The presence of the kite in Scotland is well enough known to ornithologists, and the localities also to a few who will not persecute them; but why make known to the public, scrupulous and unscrupulous alike, the very spot where it might be the last pair breeds. I know of three nests in Scotland only, but I would be very sorry to publish their whereabouts* (Harvie-Brown, 1877).

Many raptors were protected under Orders issued by County Councils, but in many counties in Scotland it was too late to save the red kite. The Wild Birds Protection Acts of 1880 and 1881 at last came to their rescue in some degree; and, by the further Wild Birds Protection Act of 1894 and 1896, County Councils were empowered to apply to the Secretary of State for Orders for the Protection of the Eggs of Wild Birds, and also for the further Protection of the Birds themselves in their respective jurisdictions (John, 1897). Although a small triumph for conservation, the acts were still considered to be inadequate because there was no element of compulsion for councils to provide for the protection of birds. The 1880 Act adopted systems where councils applied for orders to protect species by placing them on a 'White List', whereas conservationists at the time favoured a 'Black List' system, which would protect all birds automatically and councils

would have to apply for orders to remove birds from this general protection. (Bassett, 1980) In the Perthshire Wild Birds Protection Order, the kite was protected, with the birds themselves, their eggs and nests receiving year round protection. There was no protection in Stirlingshire but kites had probably already ceased to breed in the area by that time.

By the end of the 19th century the last remaining birds, perhaps no more than five to ten pairs survived precariously in the remote areas of mid Wales. In 1920 Ritchie wrote *The kite or gled exemplifies how frail is the security of numbers when man sets his hand to interfere. It is almost impossible to believe that a bird once so common should have suffered so grievously that in 1905 the few survivors in the British Isles could be counted on the fingers of one hand.* The Wild Birds Protection Acts of 1902 and 1954 furthermore cemented the 1880 -1896 Acts. It provided that where any person was convicted of an offence under the Act, the court was empowered to dispose of any bird or bird's egg which had been obtained in contravention of the legislation (John, 1897). Such protection measures may well have helped save the fragile red kite population in Wales as kite numbers steadily increased during this period, but progress was painfully slow. By 1989 there were still only 69 pairs in Wales (Lovegrove, 1990).

Pre-reintroduction

Although it is believed that kites had been eradicated as a breeding bird in Central Scotland by about 1879/1880, there remains limited documented

356 *The Scottish Naturalist.*

The following contractions are made use of in the subjoined list :—

R.—Denotes residents, or birds living in a locality more or less during the whole year.

S.—Summer migrants that breed in the locality.

W.—Winter migrants, arriving in autumn and leaving in spring.

Sp. A.—Birds that occur only during the spring or autumn migration, or both, but that do not stay in the locality.

Oc.—Occasional or periodical, but not quite regular visitants.

Ab.—Abnormal or irregular visitants, occurring only at long intervals.

Obs.—Doubtful visitants, insufficiently identified.

c,—common ; n,—not common ; r,—rare ; l,—local.

	Aber-deen.	Kin-cardine.	Forfar.	Perth.	Fife.
b118 Goshawk	Ab.		Ab.		Ab.a
120 Sparrowhawk	R.c	R	R	R	R
b121 Kite	Oc.		Oc.	R ?	

Figure 4. – Occurrence of red kites post 1879/1880. From Drummond Hay, H.M (1886).

evidence that the occasional bird survived in some districts. Red kites still appear on the species lists in the 1885-1886 Scottish Naturalist report on the ornithology of the eastern counties of Central Scotland which included; Clackmannan, Perth, Buchan and Forth districts. Although formerly common throughout the areas about 20 years earlier, they were now classified as nearly extinct i.e. Occasional or periodical, but not quite a regular visitant. Kites were still believed to be breeding in the upper districts of Perth and were subsequently noted as resident (Drummond Hay, 1886).

A few years later there are also several reports of dead kites being handed in for preservation to local taxidermists (Simpson, 1888). The last breeding record was in Glen Garry in 1917 (Thom, 1986).

British red kites are mainly sedentary. Juvenile birds often disperse widely in the autumn and then usually return in the spring, but this is not always the case. Between the 1920s-1970s, the numbers of individual kites recorded throughout Scotland increased year on year, with two being seen together near Angus in April 1969 (Thom, 1986). In the period 1979-1988, 24 kites were reported in Scotland (Lovegrove, 1990), including one bird that was spotted in 1975 and was later shot after being ringed in Wales earlier the same year (Thom, 1986). Some of these earlier Scottish vagrants may also have originated from elsewhere in the bird's European breeding range. The ability of kites travel long distances has been established from records of our local re-introduced kites which have been identified not only at locations throughout Britain but also in Northern Spain and Portugal. A 2010 juvenile made the 920 mile trip to La Espina, in the region of Asturias, northern Spain. Earlier in December 2003 one of the kites from Stirlingshire flapped its way into the record book after being recovered 1,054 miles away near Airo, just north of Porto in Portugal.

Sightings made during the 1970s and 1980s indicated there was still significant areas of habitat suitable for the return of red kites in the Stirling District. Although the Forth's countryside had changed dramatically over the 200 years since the birds were at their peak, much of the patchwork of farmland and woodland that kites depend upon was still abundant. Hopes that re-colonisation might occur naturally were considered unrealistic because the indigenous Welsh kite population was only growing slowly and showed no real signs of extending its range out of Central Wales.

Reintroduction

Towards the late 1980s the red kite was one of only three species in the UK considered to be threatened on a global scale, resulting in them being a conservation priority species. In 1989, with the spread of more enlightened attitudes, the huge growth of public interest in wildlife and following a great deal of deliberation a reintroduction programme was commenced in Scotland and England. The RSPB together with European conservationists, government

conservation agencies (Scottish Natural Heritage and English Nature), gamekeepers, landowners and farmers worked to reintroduce the red kite. A suitable source of birds for release had been found and young kites were removed as nestlings from parts of Europe with relatively healthy populations. Following the first two releases, Central Scotland was selected for the UK's third reintroduction site. In 1996, 20 young birds were brought from Sachsen-Anhalt in the former East Germany. The young nestlings were then nurtured and acclimatised in specially constructed pens before being released into the wild at secret locations near Argaty, Doune. Over the next 4 years, another 83 birds were imported. Breeding occurred for the first time in 1998 when two pairs raised five young, the first kites born in the area for over 118 years. Since then Central Scotland's red kite population has gradually expanded in size and range, with the productivity of the population being at the top end of the European range for this species.

In 2008, a decade on from the first wild chicks, 46 pairs nested in the Stirlingshire/Perthshire area and these reared 78 chicks. Most of the young have been fitted with coloured wing tags and in some instances radio transmitters, so their movement can be carefully monitored, however there will soon, hopefully, be so many birds that this practice will be difficult to maintain in the future. During the 2010 breeding season, fieldworkers managed to locate 62 territorial pairs, with 54 pairs laying clutches and a minimum of 93 young fledging successfully. It is now thought that the number of breeding pairs in Central Scotland is higher than it has been for at least two centuries, with welcome population increases across much of the county. Birds from the original release site are now spreading and some are breeding as far as 40 miles away, with particular range expansion across west Perthshire.

Argaty

Although increasing in numbers the red kite remains vulnerable to disturbance, particularly throughout the breeding season. It is therefore essential that people who want to see the kites do so in a way that maximises their enjoyment but also protects the kites. Situated near the village of Doune, the farm at Argaty became the spiritual home of the Central Scotland red kite population. These sociable raptors gathered on the farm attracting bird watchers from far and wide and so in order to let people see and learn about these wonderful birds the idea of the Argaty project was born. This successful farm diversification provides a quality positive experience to site visitors, raising their awareness and understanding of red kites, as well as the role of farming for conservation and the wider environment.

A purpose built hide offers great close-up views of the kites coming down to the daily feed, whilst the project centre offers a flexible exhibition space, used for an array of activities and events. As well as viewing the spectacular red kites, visitors can also participate in guided excursions. This allows opportunities to see wildlife friendly farming in action and prevents, as far as

reasonably practical, disturbance by controlling access near red kite roosting and nesting sites at Argaty. New for 2011 is a live nest-cam which produces fascinating and intimate footage of these stunning birds. CCTV technology beams live video to the Argaty Red Kite visitor centre, allowing visitors an opportunity to witness the day-to-day life of a red kite family, from the incubation and hatching of the eggs, to the development of the chicks into young adults.

Since the project officially opened in 2003, with help from the RSPB, it has attracted thousands of people from all over the world to enjoy the spectacle of seeing these graceful birds soaring overhead, whilst maximising the social and economic benefits that red kites bring to the Doune area.

Conclusion

The near extinction and reintroduction of the red kite is a noteworthy tale, one which has involved a considerable amount of effort and dedication by a determined group of individuals, landowners, and conservation organisations. This long term project has become one of the World's longest running species protection programmes and has been immensely successful, gradually bringing the birds back from the abyss. The future looks good for the red kite in Britain which now has a healthy breeding population but this should not allow us to become too complacent about the situation. Old attitudes sometimes linger and even now, despite their protection by law, there continue to be setbacks, especially from illegal poisoning in some areas. Conservationists must remain vigilant for any harmful developments which may impact the red kite population of the future.

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DUNBLANE WEATHER REPORT 2010

Neil Bielby

The weather station is my suburban back garden in Ochiltree, Dunblane. This is situated 50 m to the east of the Dunblane Hydro ridge, 100 m a.s.l., in a shallow, sheltered valley (NN 78990143).

I have been recording the weather since 1995 and all averages etc. refer to the last 14 years. (Note: because there is much variation from year to year in Britain in the parameters used to define climate, climatological averages are usually taken over periods of 30 years for temperature and 35 years for rainfall. Therefore, all averages in this report should be viewed with some caution). I am indebted to Dr. John P. Holland for providing weather records from Kirkton Farm, Strathfillan (NN 359283; 170 m a.s.l.) and Killin; and to the Met Office for data from their automatic weather station at Kirkton Farm. Weather recording began in 1991 at Kirkton Farm and means etc. for this site date from that year. Killin means date from 2000. The data from Kirkton allows for some interesting meteorological comparisons between the far north-west and central areas of our region.

Daily rainfall (>0.2 mm), maximum and minimum temperatures, barometric pressure, cloud cover, wind direction and speed (Beaufort scale) are recorded. Air frosts (0.0°C and below) and snow cover are also noted. All except the maximum daily temperature are recorded at 09.00 hours. A brief description of the day's weather is also made along with exceptional and unusual weather phenomena across the UK.

2010 was colder and drier than usual with the mean temperature of 7.29°C (6.35°C Kirkton) being the lowest to date at this station, 1.19°C below average. The mean maximum temperature of 11.21°C was 0.99°C below the norm while the mean minimum temperature was 1.39°C below the norm. There were 109 air frosts, the most here and twice the average (138 at Kirkton; mean 70), while there were 32 days when the maximum temperature was at or below 0.0°C (20 at Kirkton). Snow lay on the ground at 09.00 hours on 79 occasions (52 at Kirkton). The maximum temperature recorded was 25.1°C on 16 June (23.8°C Kirkton, 22 May) with the lowest being -15.1°C on 8 December (-18.2°C Kirkton, 3 and 8 December). Total precipitation of 983.8 mm was only 89 % of the average (1676 mm Kirkton, 66 % of the average. 1414 mm Killin) with amounts of >0.2 mm being recorded on 176 days, 30 fewer than normal. There were 253 days at Kirkton with >0.2 mm of precipitation. The highest amount of daily precipitation was 33.5 mm (melted snow) on 28 November while at Kirkton it was 49.6 mm on 14 September. As usual, there were seasonal variations with winter (December-February) being much colder and drier than normal. Spring (March-May) had normal temperatures but was drier than

usual. Summer (June-August) was slightly warmer than the norm but rainfall was close to the average while autumn (September-November) was cooler and wetter. Across Scotland the first 6 months were the driest since 1941. At Kirkton it was the driest year since records began in 1991.

January was markedly colder and drier than usual. The mean temperature of -0.80°C (-0.61°C Kirkton) was 2.34°C below the norm, making it not only the coldest January at this location, but also the first with a mean temperature below 0°C . It was the second coldest month here after December 2009 (-1.03°C) and taken together, December 2009 and January 2010 were the coldest in Scotland since records began in 1914. Likewise, it was the coldest January at Kirkton. It was also dry, with the 52.5 mm of precipitation being only 43 % of the norm for this month. The 90.2 mm recorded at Kirkton made this the driest January at that location. There were 19 air frosts (20 Kirkton) and snow lay on the ground for the first 16 days of the month. It was the coldest January in the UK (and large parts of Europe – from northern Spain to Poland) for 23 years.

Regular snow showers on the 2nd added to the 14 cm of lying snow and temperatures plunged to -12.1°C that night (-17.0°C Braemar): the lowest since -14.0°C in December 1995. Temperatures plummeted to -12.0°C again on the 7th and 8th (-17.4°C at Kirkton and a record equalling -22.3°C at Altnaharra, Sutherland on the 8th where the daytime maximum only reached -13.0°C). Daytime temperatures didn't rise above freezing from the 3rd-9th, reaching only -7.4°C on the 8th (the lowest daytime maximum since December 1995). Most days were sunny and calm. Many rural schools across Scotland were closed during this period and the A9 between Perth and Inverness was blocked by snow in three places on the 5th. Although most main roads were salted regularly and kept clear, other roads weren't, making driving on these treacherous. The River Forth was frozen over at Stirling Bridge (10th). The Arctic spell lasted until the 12th which included 33 consecutive night frosts. A slow thaw ensued, accompanied by raw easterly winds up until the 15th/16th, when heavy overnight rain (brought in on an Atlantic front) caused a rapid melt of the remaining lying snow. A quiet spell followed as pressure slowly built and temperatures remained below the seasonal norm. Days were mostly overcast with occasional light rain although a passing front produced 11.3 mm during the night of the 21st/22nd. Pressure built to 1039 mb (26th) with the 27th being easily the warmest day of the month with a high of 10.0°C . However, the weather remained dull and damp until the 29th when a northerly airstream developed bringing very clear air and a marked drop in temperatures, along with night frosts, until the month end (-5.3°C , 30th). The north and east coastal regions of Scotland received heavy snow showers during this period with Aberdeenshire and Moray particularly affected.

February was drier and much colder than normal. The mean temperature of 0.04°C was 2.98°C below the norm (-0.31°C Kirkton and 2.0°C to 2.5°C below the average means across Scotland) making it the coldest February at this station (the previous being February 2001 with a mean of 1.64°C). There were

20 air frosts (22 Kirkton) with -9.6°C on the 23rd (-12.7°C Kirkton) being the lowest recorded temperature here in February while the maximum temperature of 6.8°C was also a new low (11th). The maximum temperature at Kirkton was 7.9°C (14th). It was the coldest February across the UK since 1991. Precipitation of 79.0 mm was 81 % of the monthly average with 64 mm of this being snowfall (Killin 46 mm; Kirkton 85.4 mm – the lowest since records began). Much of western Scotland received less than half the normal February precipitation. There was measurable precipitation on only 12 days (20 Kirkton) while snow lay on the ground on eight mornings.

Temperatures remained below the seasonal norm with occasional sharp frosts (-6.9°C ; -10.0°C Dalwhinnie 3rd). Snow fell during the night of the 3rd/4th with 3.0 cm lying at 09.00 hours the following day (10.0 cm Kirkton). With pressure building to 1029 mb by the 12th, the weather remained settled with several sunny days during which a little warmth could be felt. There were night frosts from the 8th to the 14th (lowest -6.9°C , 10th) with daytime temperatures struggling to 6.8°C (11th). There was a morning of rain on the 15th (3.5 mm) as barometric pressure fell. However, despite (or because of?) Scotland being in the centre of a low pressure system (986 mb) from the 14th to the 23rd, there were sharp night frosts from the 16th-23rd (-9.6°C 23rd; -19.2°C Braemar) and the days were mostly cloudless and calm. Despite the sun, daytime temperatures rarely rose above 2.0°C . A front moving up from the south on the 24th produced snow during that night. It continued snowing virtually non-stop until 09.00 hours on the 26th by which time 15.0 cm (6 in) of wet, heavy snow had accumulated in Dunblane (Bridge of Allan and Stirling by contrast, were virtually snow free with sleet/rain instead of snow, whereas Aviemore had 44.0 cm). This heavy snow caused havoc in Perthshire and NE Scotland, bringing down powerlines which left c.40,000 homes without electricity and many roads in the area impassable. These included the A9 between the Keir roundabout and Perth during the whole of the 25th due to accidents and cars abandoned in the snow. Three days of snow melted to 62.0 mm of water.

March was colder and slightly drier than normal. The mean temperature of 3.84°C (3.43°C Kirkton) was 1.05°C below the norm while the total precipitation of 64.5 mm was 84 % of the average (62 % of this was snow). Killin recorded 68.8 mm and Kirkton 112.6 mm. There were 11 air frosts (18 Kirkton) while snow lay on the ground at 09.00 hours on 16 days. Measurable precipitation occurred on only 12 days (25 Kirkton).

The weather remained cold and settled with sharp night frosts (-8.4°C Dunblane; -9.7°C Kirkton; -14.0°C Tulloch Br (2nd); -18.6°C Braemar (4th)) and mostly sunny days. Lerwick reported 18.0 cm of fresh snow on the morning of the 2nd. There was no measurable precipitation here for 17 days preceding the 16th while snow lay on the ground for 19 consecutive days until the 14th with my fairly large garden pond remaining frozen until the 18th. The weather turned unsettled from the 16th as south-westerly airstreams predominated and

regular Atlantic fronts crossed the country. It was much duller but rainfall amounts were low. Snow on gale force north-easterly winds fell during the night of the 29th/30th continuing until the morning of the 31st. A maximum of 3 inches of wet snow accumulated. As this belt of snow moved steadily north-east across Scotland, several roads were blocked and many homes in the north-east of the country experienced prolonged power cuts as the heavy, wet snow brought down lines. The Aviemore to Inverness train became stuck in a snowdrift at the Slochd summit late on the 31st with a 2nd relief train suffering the same fate. A 3rd train finally delivered passengers to Inverness at 03.00 hours on the 1st April. 45 cm of lying snow was reported from Aviemore (31st).

April was warmer than normal with the mean temperature of 9.03°C (7.00°C Kirkton) being 1.14°C above the average. Daytime maximums were close to normal but the night lows were 2.0°C above the mean. Precipitation of 65.2 mm was very slightly above average (125 mm Killin; 143.8 mm Kirkton) with measurable precipitation occurring on 13 days (23 Kirkton). There were five air frosts (11 Kirkton) and snow lay on the ground at 09.00 hours on the first 2 days of the month.

The month started cold & frosty (-4.5°C; -6.7°C Kirkton; -7.0°C Braemar 2nd) with virtually unbroken sunshine during the first 2 days with 12 hours at Kinloss (3rd). The weather then turned very unsettled with almost constant rain on strong southerly winds during the 5th/6th. Subsequently, high pressure built over the UK giving mainly sunny, calm days with no measurable precipitation until the 18th, after which it remained unsettled to the month end. Temperatures peaked at 17.6°C; 12th (20.0°C Kirkton) during this period. It turned noticeably colder from the 13th with daytime maximums not breaching 15.0°C until the 24th and dropping to -3.8°C during the early hours of the 21st. Unsettled conditions with average temperatures then ensued until the month end.

May was slightly cooler but much drier than normal. The mean temperature of 10.88°C (8.29°C Kirkton) was 0.12°C below average with the night low being 0.72°C below and the daytime high 0.48°C above their long-term norms for this month. There were three air frosts (10 Kirkton). Rainfall of 33.0 mm was only 48 % of the average making this the 3rd driest May since 1995. It was the driest month of the year at both Killin (22.0 mm) and Kirkton (33.4 mm) as well as the driest May across the UK since 1998 and the coldest for 14 years. Measurable rainfall occurred on 12 days (15 Kirkton).

An easterly/north-easterly airstream depressed temperatures until the 13th with night frosts on the 3rd, 8th and 11th (lowest -1.9°C 3rd; -5.0°C Kirkton 8th) while daytime temperatures struggled to reach 15°C (11.5°C; 2nd). There were reasonable amounts of sunshine and little rain, although there were occasional snow flurries on the 11th. An Atlantic front crossed Scotland during the afternoon/evening of the 13th producing the first significant rainfall of the

month (5.4 mm). Temperatures slowly improved to above the seasonal norm, reaching a hot 26.0°C on the 21st (23.8°C Kirkton, 22nd – the hottest day of the year here) with the only rain during this period falling during the nights of the 18th and 22nd. Daytime temperatures fell away again from the 25th reaching only 14.7°C on the 28th. However, it remained largely dry and sunny until the month end, although heavy downpours during the night of the 29th/30th produced 12.2 mm (26.0 mm Kinloss).

June was warmer and much drier than normal. The mean temperature of 15.63°C (13.81°C, Kirkton) was 1.56°C above the norm making it the warmest ever June at this station (c. +2.0°C in western Scotland). Night lows were +0.78°C and daytime highs +2.34°C. Total rainfall of 27.3 mm (43.0 mm Kirkton, 67 mm Killin) was only 46 % of the norm with measurable amounts on only seven days (10 Kirkton). Almost 50 % of this total fell on one day (13.0 mm, 8th). Average pressure of 1017 mb was 2 mb above the mean with a high of 1029 mb and low of 1005 mb. It was the driest first 6 months to a year across the UK since 1929.

The first few days of the month were mostly sunny, humid and warm with a maximum temperature of 24.9°C on the 5th (29.0°C East Yorkshire). Rain all day and night on the 8th/9th (13.0 mm) was the only blemish on the continuing spell of fine weather. High pressure built again over the UK from the 14th (1029 mb, 15th) producing another run of sunny, warm days with temperatures reaching 25.1°C on the 17th (23.0°C Kirkton). For most of this period the west of Scotland enjoyed the better weather with cloud and haar often depressing temperatures up the east coast. Northerly breezes also kept temperatures down over the weekend of the 19th/20th, falling to 0°C at Carter Bar. Spells of rain during the nights of the 27th/28th and 28th/29th heralded the end to a long spell of fine weather.

July was slightly cooler but much wetter than usual. The mean temperature of 15.58°C (13.74°C Kirkton) was 0.29°C below the norm (av. high -1.15°C; av. low +0.57°C). Total rainfall of 156.2 mm (198.0 mm Kirkton) was 89 % above the mean making it the wettest July since 2002 (156.3 mm) and the wettest month since November 2009. Measurable rainfall occurred on 19 days (27 Kirkton).

The first 3 weeks of the month were very unsettled with rain almost every day. The 4th was particularly wet, with heavy rain during the morning and an electric storm during the afternoon producing 21.0 mm. It was often windy, mostly from the southerly quadrant. While England sweltered in the highest temperatures of the year (31.7°C Gravesend, Kent. 9th), Scotland shivered, with the thermometer struggling to only 14.5°C (10th). Regular Atlantic lows continued to meander slowly across the country keeping the weather very changeable. The 14th/15th were particularly miserable with 45.2 mm of rain in 48 hours and temperatures only reaching an unseasonable 14.2°C on the 14th (11.7°C Glascarnoch). Fresh westerlies on the 16th/17th kept the showers brief but were strong enough to halt play in the Open Golf Championship at St

Andrews. Further low pressure systems produced 35.9 mm of rain between the 19th and 21st (50.0 mm in 10 hours in Perth which flooded c.100 homes in the city centre). The weather improved from the 22nd with several sunny days and only 1.0 mm of measurable rain to the month end. During this period there was a marked east/west split across Scotland with the north and west experiencing much wetter, cooler weather than the south and east.

August was cooler and drier than normal with the mean temperature of 14.42°C (12.52°C Kirkton) being 0.88°C below the average. It was the coolest August across Scotland since 1998. The 1.9°C recorded on the 30th was the lowest August temperature at this station. Rainfall of 56.4 mm (82.5 mm Killin; 136.0 mm Kirkton) was only 66 % of the norm with measurable amounts (>0.2 mm) being recorded on 16 days (27 Kirkton). The average barometric pressure was 1012 mb with a high of 1027 mb and a low of 996 mb. Most of England and Wales fared worse with the coolest August since 1993 and rainfall well above average in most regions. The maximum temperature in the UK was 26.7°C (at Lowestoft (20th) and Weybourne, Norfolk (21st)) while the minimum was -1.3°C at Altnaharra (26th). A wind gust of 70 mph was recorded on South Uist (20th).

The first 3 weeks were reasonably settled with daytime temperatures mostly above 20.0°C (23.5°C, 7th). A low pressure system produced 12.5 mm of rain on the 9th/10th while another deposited 11.0 mm during the night of the 16th/17th. Otherwise, there were only occasional small amounts of rain with several warm, sunny days. It turned cooler during the 4th week with maximum daytime temperatures struggling to reach 20.0°C (only 16.7°C, 22nd). It continued largely dry, although a low pressure system produced 12.5 mm during the 22nd-24th. A night low of -1.0°C was recorded at Altnaharra (26th) while an unstable north-westerly airstream between the 28th-30th depressed temperatures, falling to an unseasonal 1.9°C during the early hours of the 30th and struggling to a daily high of only 15.9°C later in the day. A ridge of high pressure then developed over the UK (1021 mb) and the final 2 days of the month were warm with virtually unbroken sunshine.

The **September** mean temperature of 12.20°C (11.50°C Kirkton) almost exactly matched the average but there was 36 % more rainfall with 119 mm recorded (187 mm Killin; 236.2 mm Kirkton). The daily maximum of only 9.1°C on the 27th was the lowest for the month at this station while the air frost the previous day was only the 3rd for this month over the past 16 years (three Kirkton). Measurable rainfall occurred on 16 days (24 Kirkton)

The settled, warm spell lasted until the 5th with temperatures peaking at 22.6°C on the 4th (20.5°C Kirkton; 25.0°C Kinlochewe, 3rd). Rain on strong easterlies during the morning of the 7th gave way to thundery downpours in the afternoon providing an accumulation of 11.7 mm. It remained unsettled with wet days (10th and 13th especially – a 24 hour total of 50.2 mm being recorded at Kirkton at 09.00 hours on the 14th) interspersed with brighter, drier

ones (8th and 16th). Light, northerly winds on the 17th brought an autumnal feel with a night-time low of 2.9°C and day high of 14.5°C. A vigorous Atlantic front produced heavy rain during the early hours of the 19th (17.1 mm) while another one on the 22nd/23rd (21.1 mm) was accompanied by thunder and lightning. A ridge of high pressure (1021 mb) resulted in three virtually cloudless, perfect autumn days (24th-26th) with the accompanying northerly airstream not only providing very clear air, but also the first frost of the autumn (-1.4°C, 26th; -4.3°C, Tyndrum). An easterly airstream on the 27th depressed temperatures which struggled to reach 9.1°C. An Atlantic depression then deposited 20 mm in 20 hours from 18.00 hours on the 28th. After a misty start, the final day of the month was sunny and calm.

October was slightly cooler and drier than normal. The mean temperature of 8.22°C (7.97°C Kirkton) was 0.26°C below average while the rainfall total of 126.5 mm was 93 % of the norm. In contrast, Kirkton received 291.4 mm (11 % above the mean) making it the wettest month of the year there. Measurable rainfall occurred on 15 days (26 Kirkton). There were three air frosts (eight Kirkton) and one ground frost. The mean air pressure was 1009.7 mb with a high of 1026 mb and low of 986 mb.

The month began with a succession of Atlantic fronts crossing the UK which produced rain every day until the 7th when high pressure started to build to the north of Scotland. A southerly airstream on the 7th raised temperatures to an unseasonal 17.1°C (15.0°C Kirkton; 23.1°C Chivenor, Devon, 8th) but thereafter, easterly winds brought dull and damp weather to the eastern half of Scotland while the west was mostly bathed in sunshine. The high pressure system (1025 mb) persisted until the 18th. There was little or no wind from the 11th but a dense layer of cloud, trapped under the high pressure, produced four consecutive dull days (12th-15th) and depressed temperatures (max. of 8.3°C, 12th). The 2nd frost of the autumn (3.0°C; 5.0°C Tyndrum) was the prelude to a day of unbroken sunshine (20th) but a slow moving depression with a front lying west to east across Central Scotland deposited 44.5 mm of unrelenting rain in 36 hours from 22.00 on the 21st. This cleared from the north during the morning of the 23rd as a northerly airstream developed. The fine weather with night frosts (-3.1°C; -6.1°C Kirkton 25th) lasted until the night of the 25th/26th. An Atlantic low (980 mb) then deposited 48.5 mm of rain over the following 4 days. This was accompanied by strong southwesterly winds on the 27th which closed several of Scotland's major bridges to high-sided vehicles and disrupted west coast ferries.

November was much colder and wetter than normal. The mean temperature of 2.21°C (2.33°C Kirkton) was the second coldest for this month at this station (after 2.20°C in 1996) being 2.36°C below the average. Several new records were set with the mean high (4.66°C); night minimum (-9.2°C); daytime high (9.8°C) and night high (5.5°C) all being new lows. The 16 air frosts (19 Kirkton) were also a new high for this month while snow lay on the ground for the last 6 days of the month. It was also the coldest November at Kirkton.

The 170.8 mm of precipitation (36 % of which was snow) was 68 % above the norm (251.5 mm Killin; 245.6 mm Kirkton). Measurable rainfall occurred on 22 days (20 Kirkton). In Scotland the mean temperature was c.2.0°C below the 1971-2000 average and it was the coldest November since 1985. Sunshine totals were generally above average with the west enjoying one of the sunniest Novembers on record. Across the UK it was the coldest November since 1993. A maximum temperature of 19.0°C was recorded at St James's Park, London (4th) and a minimum of -18.0°C at Llysdinam, Powys (28th).

A succession of Atlantic fronts deposited 49.8 mm of rain over the first 5 days before a ridge of high pressure brought a brief interlude of calm, sunny weather and night frosts on the 6th/7th. 'Atlantic' weather then re-established itself as two very deep lows (973 mb and 968 mb) crossed eastwards over northern Scotland on the 8th and 11th. These deposited copious amounts of rainfall with a marked west to east gradient (24 hour totals of 10.5 mm at Dunblane and 48.0 mm Kirkton at 09.00 hours on the 11th) and were accompanied by strong winds (91 mph Capel Curig, Wales) which disrupted ferry services, especially in the south-west of Scotland. These weather systems were separated by a weak ridge of high pressure on the 10th which was a calm day of unbroken sunshine. Precipitation above 500 m fell as snow, 'plastering' the hills and allowing skiing on Cairngorm for the first time this winter. A spell of calmer weather resulted in a frost of -4.9°C on the 15th (-7.2°C Tyndrum) with dense patches of fog being slow to lift in the Trossach glens. Brisk south-easterlies blew on the 17th and 18th. Torrential downpours caused flash flooding around the St Austell's area of Cornwall with cars swept away and houses flooded (17th). A combination of a 'blocking' high pressure in the North Atlantic and low pressure over the Baltic drew in northerly and north-easterly winds from the 22nd. This Arctic/Siberian airflow produced snow along the north and down the east coasts of Scotland from the 24th with 15.0 cm lying in Aberdeen by the morning of the 26th. This caused 100 schools to be closed in Aberdeenshire as well as many high level and minor roads. Central Scotland was in a 'snow shadow' and enjoyed sunny, if cold, weather until the night of the 26th/27th when 7.0 cm (3 inches) on snow fell in Dunblane. The 27th was cloudless and calm but cold, as daytime temperatures struggled to reach a 'high' of -3.4°C. Further heavy snow through the night of the 27th/28th continued falling more or less unabated until the early hours of the 29th so that by 09.00 hours, there was a level depth of 42 cm (16.5 inches) - the most ever at this station. The A9 between Dunblane and Perth was closed north of the Keir roundabout while all schools were closed in Perth and Kinross as well as many other parts of the north-east and east of Scotland. The west of Scotland largely escaped the snow and clear skies resulted in temperatures plummeting to -16.1°C at Altnaharra, Sutherland (29th). A further 4 inches of snow fell during the night of the 29th/30th raising the level depth of snow to 46 cm (17.75 inches) at 09.00 hours on the 30th (18 cm Kirkton). A November low of -9.2°C was recorded at this station on the 28th (-8.3°C Kirkton) while temperatures failed to rise above 0°C during the last 4 days of the month.

December was the coldest ever month at both this station (and at Kirkton) with the mean temperature of minus 3.76°C being 5.47°C below the average. The mean temperature at Kirkton was -4.42°C. There were air frosts every night (27 Kirkton) and the mean minimum temperature of minus 6.85°C was almost twice as low as that for December 2009 (the previous lowest at this station). The maximum day mean temperature was minus 0.67°C (the first time this has been below zero for any month here). Daytime temperatures failed to reach zero degrees Celsius on 16 occasions and the -8.0°C (7th) was the lowest daily maximum recorded at this location. Total precipitation of 32.4 mm was also a new low for December (only 34 % of the norm) with amounts greater than 0.2 mm being recorded on only 9 days (13 Kirkton). It was the 2nd driest December at Kirkton with the 60.4 mm recorded being only 21 % of the mean. Snow lay on the ground throughout the month. Average pressure was 1016 mb with a high of 1040 mb and a low of 994 mb. It was also the coldest December across Scotland since records began and the second coldest ever month after February 1947. Across the UK, it was the coldest December in over 100 years (and the coldest calendar month since February 1986) with mean temperatures some 5°C below the 1971-2000 average. It was the driest December over the UK since 1963 and the 3rd driest in a series going back 100 years. The west and north of the UK received much more sunshine than normal with western Scotland enjoying its sunniest December on record.

The Arctic weather continued with further snowfalls down the east coast of Scotland on the 1st closing the Forth Road Bridge for the first time when c.1,500 schools were also closed across the country. The days were largely sunny but temperatures plummeted to -14.0°C during the early hours of the 3rd (-18.2°C Kirkton; -18.9°C, Strathallan; -21.3°C, Altnaharra, Sutherland). A band of snow moving slowly south across Scotland brought chaos to the Central Belt on the 6th. Most of the motorway system was blocked for many hours and buses and trains were virtually brought to a standstill. Glasgow and Edinburgh airports were closed until the evening and while 90 % of Scottish schools re-opened, most in the Central Belt had sent their children home again by mid-day. In Dunblane it snowed until noon depositing a further 7 cm (snow depth at Kirkton was 23 cm from the 6th-9th). The transport chaos in the Central Belt continued through the night of the 6th/7th with many people trapped in their vehicles (over 1,000 on the M876 alone!) as temperatures plummeted to -15.0°C. The A and M 80's north from Glasgow, especially around Cumbernauld, remained at a standstill as did parts of the M8. Many other drivers abandoned their vehicles which seriously hampered attempts to clear the roads. Temperatures struggled to reach -8.0°C during daylight hours on the 7th (at these low temperatures the salt being put on the roads ceases to work because it cannot depress the freezing point sufficiently). Most of the motorway system in the Central Belt had at least one lane re-opened during the 7th apart from 20 miles of the west-bound carriageway on the M8 (from junction's one to five) which remained closed for 48 hours until noon on the 8th due to thick, rutted ice. During the early hours of the 8th the temperature fell to the lowest ever recorded at this station, -15.1°C (-18.2°C, Kirkton);

reaching only -5.0°C during a second calm day with cloudless skies. A slight thaw on the 9th became a moderate one the following day as south-westerly winds raised the temperature to 6.0°C . This daytime respite from freezing temperatures was brief however, as the mercury failed to break zero on both the 12th and 13th. Night values fell to -8.4°C (13th) and -9.3°C (18th, when -14.0°C was recorded at Tyndrum). Several days were cloudless and calm but there was little warmth in the low winter sun with the shortest day approaching. Although much lying snow remained, the only precipitation the Stirling area received from the 5th to the 18th was 2.0 mm of rain during the night of the 15th/16th. Other parts of Scotland fared worse, with northerly blizzards hitting the Northern and Western Isles along with the north and north-east of Scotland on the 17th causing travel chaos and the closure of most schools in these areas yet again.

Snow showers during the afternoon of the 19th produced a further 5 cm of snow but high pressure then developed over the country giving six consecutive virtually cloudless and calm days culminating on the 25th, when the faintest dusting of snow was evident at dawn. With largely clear skies it remained very cold with a minimum temperature of -13.6°C on the 21st (-16.3°C Tyndrum). Daytime values also remained below freezing from the 17th to the 24th reaching only -5.3°C on the 22nd. During this period, the River Forth froze over at Craigforth. Heavy rain during the night of the 26th/27th saw temperatures struggle into positive values and further unsettled, damp weather resulted in a slow thaw to the year's end when 12 cm (4.75 in) of level snow still lay at this location.

Table 1. Temperature and precipitation 2010. N. Bielby Climatological Station Dunblane.

	Temp Mean maxima	Temp Mean minima	Number of air frosts	Total precipitation (mm)	Greatest 24 hour total (mm)	Number of days of measurable rain
January	4 (4.5/6.5)	-0.1 (0.2/0.5)	15 (14/13)	108.2 (122.5/110.7)	14.5 (35.0)	19 (20)
January	1.6 (4.5/6.2)	-3.4 (0.2/-0.3)	19/20 (14)	52.5 (122.5/364.2)	11.3 (35.0)	14 (20/26)
February	3.1 (5.9/6.6)	-3.0 (0.2/ -0.1)	20/22 (11)	79.0 (98.3/247.9)	32.0 (38.0)	13 (17/23)
March	7.8 (8.5/8.3)	-0.1 (1.3/0.8)	11/18 (11)	64.5 (76.5/239.6)	21.0 (30.5)	12 (16/26)
April	12.7 (12.3/11.2)	5.4 (3.5/2.6)	5/11 (4)	65.2 (63.1/148.9)	16.0 (27.8)	13 (15/21)
May	16.7 (16.2/14.5)	5.1 (5.8/4.6)	3/10 (2)	33.0 (68.1/120.3)	12.2 (27.1)	13 (17/19)
June	21.5 (19.2/16.8)	9.7 (8.9/7.5)	0 (0/<1)	27.3 (72.8/118.1)	13.0 (28.0)	9 (15/17)
July	19.8 (21.0/18.1)	11.3 (10.8/9.4)	0 (0/0)	156.2 (82.5/124.1)	26.2 (33.5)	20 (16/27)
August	19.6 (20.1/18.1)	9.3 (10.5/8.9)	0 (0/0)	56.4 (85.5/143.1)	10.0 (35.4)	17 (15/28)
September	16.3 (16.1/15.7)	8.1 (8.4/6.9)	1/3 (<1)	119.0 (87.6/196.3)	21.0 (36.5)	18 (17/24)
October	11.6 (11.8/11.8)	4.9 (5.2/4.5)	3/ 8 (3)	126.5 (135.5/261.8)	28.5 (41.9)	15 (21/27)
November	4.7 (7.2/8.5)	-0.3 (1.9/1.8)	16/ 19 (8)	170.8 (116.3/282.0)	33.5 (39.0)	23 (20/24)
December	-0.7 (3.9/6.7)	-6.9 (-0.4/-1.2)	31/27 (16)	32.4 (95.7/281.9)	11.1 (26.8)	9 (18/20)
Year	11.2 (12.2/111.8)	3.4 (4.8/3.77)	109/138 (58)	982.8 (1104.4)/2528.2	33.5 (41.9)	176 (207/280)

The Climatological normals Dunblane/Kirkton are shown in ()'s. Number of air frosts Dunblane / Kirkton with Dunblane mean in parenthesis. Figure in parenthesis in the 'Greatest 24 hour total (mm)' refer to the highest ever value for that month. Temperatures are given in degrees Celsius.

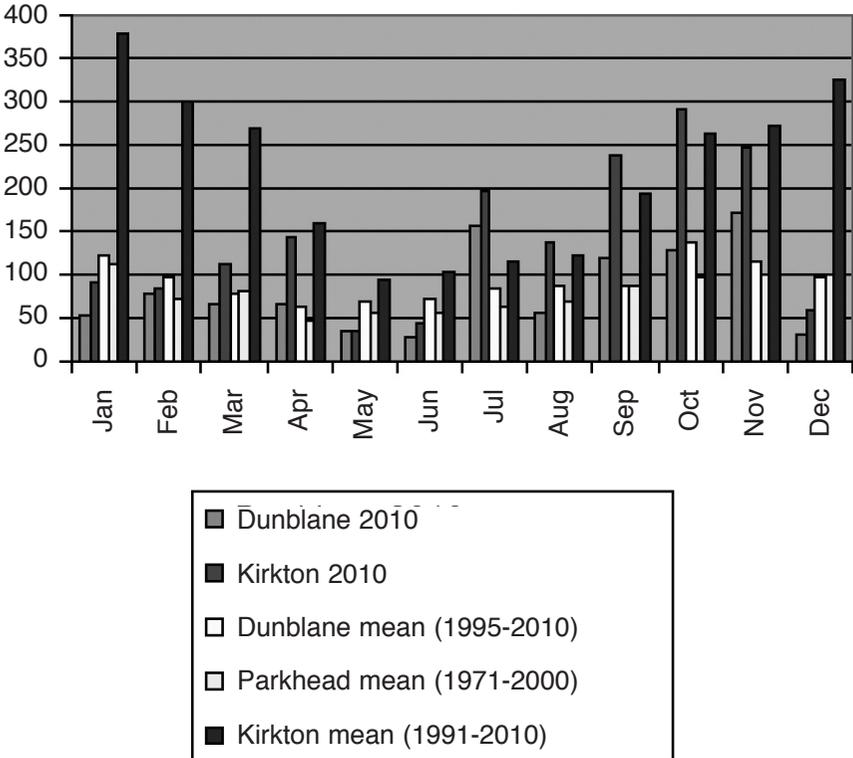


Figure 1. Rainfall 2010

LANDSLIDES IN KIPPENRAIT GLEN – OBSERVATIONS 11 APRIL TO 24 JUNE 2011

Michael F. Thomas

In 2009 I published a paper in the *Forth Naturalist and Historian Journal* documenting the geology and geomorphology of the landslides in Kippenrait Glen. This was based on observations since the late 1990s until 2009. Severe winters in 2009/10 and 2010/11 have led to significant changes to these features, with the most aggressive changes having taken place since February 2011, following the thaw in late January and successive heavy rains through March, and again in June. In my view these changes constitute a serious threat to the maintenance of the cycle/footpath along the former Glen Road, and the following is a short report with a photographic record of the recent changes.

There are three major landslides active since 1999, numbered 1, 2, 3, walking N towards the bridge on Glen Road. But as noted in my earlier paper the surrounding slopes also show marked signs of instability.

Landslide 1 (the 'main' landslide) is the largest and most active of the three major slides (but there are other smaller, or less active slides that do not yet intrude on the road pavement). Figures 1, 2, 3 show significant re-activation at the headcut, with the deposition of a fresh debris fan at mid-slope. This activity has continued since the slides first formed in 1999, but the most significant changes have occurred in 2011, with lesser events in 2010. Figure 2A shows the points at which the renewed activity threatens the integrity of the road pavement and fencing (foreground). Figure 2B shows details of the most threatening headcut, which is increasingly exposing the fence post and reducing the pavement area. Measurements taken at the site on 11 April 2011 are shown in Figure 3. The headcut at A in Figure 2 is also shown in Figure 4, which reveals a crack in the bitumen pavement that also penetrates the supporting boulder clay on which the road is built. A thin slab of the boulder clay is also shown to be detached. The likelihood that the boulder clay will fail is high and this will take the pavement with it at this point. Figure 3 shows that the retreat from the fence line has been 23 cm (0.23 m) since 2008/9 (~8 cm per annum) and that the present overhang is 10-15 cm. From Figures 1 and 2 it can be seen that most activity is actually at and beyond location C over a distance of over 5 m. The overhang here could not be measured, and so far does not encroach on the road pavement, but future recession along this section of Landslide 1 could quite rapidly threaten the roadway.



Figure 1. Landslide 1 (numbered approaching from down-valley): This shows new erosion with a debris flow (left), and encroachment on the road pavement (right and below, Figure 2).

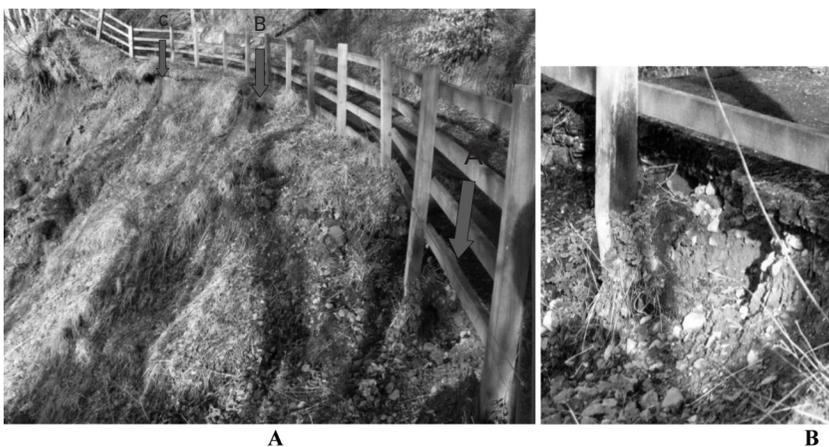


Figure 2. Three aggressive scars (head-cuts): A, B, C, showing active erosion in 2011 (picture left, A). Picture right (B) shows detail. See also Figure 3 below.

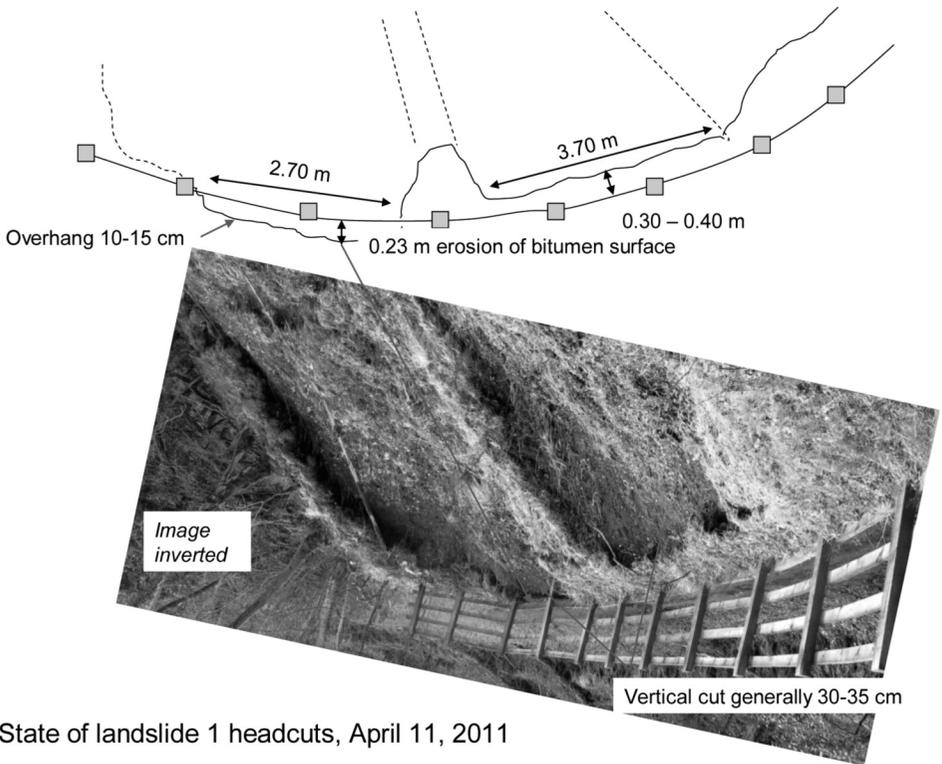


Figure 3. Diagram (not to scale) showing detail of Landslide 1 encroachment in 2011.

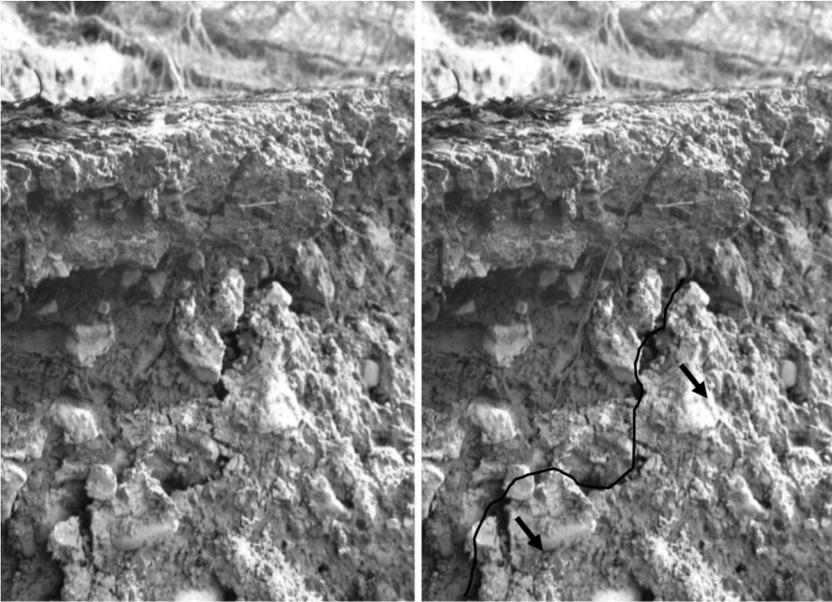


Figure 4. Landslide 1 (detail), showing the current threat to the pavement. A crack penetrates through the bitumen into the supporting boulder clay (red), while another fracture is leading to displacement of a slab of boulder clay (black).

These processes are not new. They have continued since the initial failures that took place in 1999, but a succession of mild winters has kept frost damage to a minimum until the last 2 years. What appears to happen is analogous with pothole development on road pavements, though the initial stress factors will be different. Small cracks form in the bitumen close to the landslide head-cut and water penetrates these in winter and freezes. Frequent cycles of freeze-thaw gradually lead to opening of the cracks and the separation of fragments of the bitumen. The road pavement also becomes undermined if the same process affects the supporting boulder clay, which is less cohesive and will break away under gravity, particularly when pore-water pressures increase after rainfall. Blocked drains and culverts increase the amount of water available to saturate the sub-soil, also lead to surface water flows across the road surface when temperatures are above freezing. This erodes the boulder clay beneath and is particularly serious at Landslide 2.



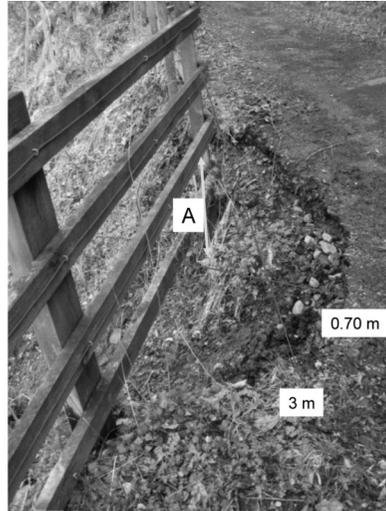
Figure 5. Changes at Landslide 1 since 2006.

Since 2009, it can be seen from Figure 5 that this landslide has become more active at A, where the road pavement is being eroded now, and at B, where the head-cut has experienced renewed erosion. In Figures 1 and 2A the active erosion at C is evident, and this is one of the most active parts of the landslide, though currently not threatening the road (cut is ~1m from the road).

Landslide 2 also shows significant changes. Here the maximum erosion from the fence line is now 70 cm (0.70 m) and encroachment occurs over a distance of ~ 3.0 m (Figure 6). One fence post is now exposed to depth of 60 cm below the road surface. Erosion by surface water appears to be the most serious threat at this site, and it can be seen that down slope from the head-cut a gully has formed (rather than an accumulation of displaced debris). This suggests that after heavy rain, in any season, there may be renewed erosion at this point. Although the bitumen surface offers resistance to erosion by flowing water it is progressively undermined by splash and eddying as occurs at most natural waterfalls. Very heavy rainfall, similar to that experienced in this area in August 2004 (when the Glen Ogle emergency occurred and the Bracklyn Falls Bridge was destroyed) could lead to significant erosion at this point within a short period of time.



This aggressive headcut at Landslide 2 is developing As a gully-head, fed by runoff from the road. This could enlarge rapidly during abnormal heavy rain, such as was experienced in August 2004.



Vertical exposure of the fence post
Below road level at A is 0.60 m

Figure 6. Landslide 2, showing significant retreat of the pavement from the fencing: 3A. The erosion and retreat here is 70 cm. 3B. Overhang of the pavement at this point is 10-30 cm.

Landslide 3 was observed in April 2011 to have a smaller but potentially aggressive head-cut with a width of 60 cm, penetrating the pavement by 30 cm. At that date there was a 10-15 cm overhang. Following heavy rains in May and June the scar had enlarged to 90 x 35 cm, a 4-5 cm slice of tarmac having broken off more or less evenly around the circumference of the head-cut. By contrast there had been no measurable retreat at Landslide 2, where the overhang was minimal in April 2011. Debris from an earlier erosion of the tarmac could be identified (Figure 6b). This supports the argument that surface water flow is the main agent of erosion at these head-cuts, creating small waterfalls that induce erosion in the weaker material supporting the pavement. Once the overhang exceeds some threshold, around 10-15 cm, collapse occurs and the process is repeated. At Stirling University >70 mm of rain fell between 21/05/11 and 08/06/2011, and on the latter date 30 min intensities reached 48.8 mm/hour and 90.8 mm/hour between 15.30 and 16.30 h. If similar rates occurred in Kippenrait Glen, then significant surface runoff would have taken place.

Conclusions

Progressive narrowing of the road pavement, with renewal of fencing, has taken place repeatedly since 1999, but at the recent rate of erosion redrawing

the fence line is unlikely to maintain the cycle path for more than 3-5 years, without remedial measures, and the safety of walkers may be threatened in less than 10 years. In 2009 I surmised that the road would be destroyed over a period of decades, but this did not take account of the effects of recent erosion at the most active sites. Thus, while the road may not be completely destroyed in a shorter period, it will be narrowed at specific locations, and further landslides cannot be ruled out. The measured retreat at A of 23 cm in 3 winters averages ~8cm per annum, which would lead to a loss of road/path width of 80 cm in 10 years.

The steep slopes of the gorge section in Kippenrait Glen, show all the signs of instability and poor drainage that have led not only to the landslides described here, and more fully in my previous study (Thomas, 2009), but also threaten the roadway from above. Gabions were placed in certain locations many years ago to protect the road from encroachment of debris. Any attempt to cut back the upper slopes to compensate for loss of the path due to erosion would clearly be dangerous in these circumstances. There have been attempts in the past to drain these upper slopes and there is a long dyke that runs down towards the Glen Road where it first approaches the gorge section from Bridge of Allan. But it is also evident that field drains from the farmland above the shoulder of the valley shed additional water onto the slopes.

It is to be hoped that engineers will find a method to protect this important route for cyclists and walkers, but I suspect that available and affordable solutions can only obtain a temporary reprieve for the Glen Road.

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PLANT REPORT 2010 – 2011

Roy Sexton et al.

Plant Local Action NeTwork is an informal grouping of botanists whose objective is to assist with the monitoring and conservation of the local flora.

Participants: Liz Albert, Bob Cook, Jennifer Davidson, Mary Gooch, Jan Harbidge, Jane Jones, Liz Lavery, Sarah Longrigg, Steve Longster, John Mitchell, Pam Murdoch, Anna Perks, Roy and Sue Sexton, John Snodin, Paul Stanley, Edna Stewart, Eleanor Strain and Ian Warburton. (Contact; Roy Sexton RoyGravedigger@aol.com)

Although much surveying and monitoring work was carried out in the summer of 2010, this year's report is dedicated to two of our rare local plant celebrities: Young's Helleborine (*Epipactis youngiana*) and the Labrador Tea (*Ledum palustre*).

The Bridge of Allan School Board's Wild Flower Competition and the Discovery of the Labrador Tea.

It must be a rare occurrence that the wild flower collection of a school child led to the introduction of a new species into the British Flora, but this appears to have been the result of the efforts of Nellie Geddes, a cobbler's daughter from Bridge of Allan. Her father, who had no background in botany, was determined that his daughter would win the prize offered by Bridge of Allan School Board for the best wild flower collection made during the summer of 1879. Amongst the plants the Geddes family gathered was a specimen of a small Ericaceous shrub they could not identify (Shearer, 1890). It was growing on the raised bog which used to occupy the area between Lecropt Kirk and the River Teith. The local naturalists of the day, including the eminent botanist Alexander Croall (curator of the Smith Museum), were also unable to identify the specimen and dismissed it as an introduction. Subsequently the mystery plants flowered and a specimen was sent to Sir Joseph Hooker, the Director of Kew, together with a letter from Nellie suggesting it might be *Ledum* and stating that it *was said to have been found in Ireland and not mentioned as being got in Scotland*. Kew confirmed the plant was *Ledum palustre* and subsequently it was listed as a native plant. For instance in *The Flora of the British Isles* Clapham et al. (1962) state : *Ledum palustre, possibly native on bogs near Bridge of Allan*. *Ledum* had been introduced into cultivation in Britain from North America more than a century earlier and was commonly known as Labrador tea on account of its use by trappers as tea substitute.

It appears that *Ledum* had been recorded in Bridge of Allan many years before the Geddes family brought it to the attention of the botanical world

(Morris, 1931). Charles Rogers in his *Guide to a Week at Bridge of Allan 1858* refers to it being discovered by Dr Alex Paterson, the local physician. Mr A. Buchan exhibited the plant during an address given to the Botanical Society of Edinburgh in 1860 on *The Occurrence of Ledum palustre near Bridge of Allan*. An accompanying short report stated: *The plant has been known for many years to exist in quantity in a bog near Bridge of Allan. The drainage of the bog is causing a rapid decrease in numbers.* Seventeen years later Dr Paterson similarly exhibited a flowering Lecropt plant to the Edinburgh Botanical Society a piece from which is preserved in the herbarium of the Royal Botanic Gardens Edinburgh (RBGE). Another example was shown at a meeting of the Royal Botanical Society in London, and specimens were sent to the Botanic gardens at Kew, Dublin and Edinburgh.

Ledum palustre is a member of the Ericaceae and is now included in the genus *Rhododendron*. It is a small evergreen shrub usually less than 1.0 m high, with leathery leaves having prominently in-curved margins and coated with rusty hairs on the lower side (Plate 1). The flowers are small (1 cm), creamy white and born terminally in showy umbels. *Ledum* is an atypical of member of the Ericaceae because its petals are largely free rather than being joined into a tube like most rhododendrons.

The genus *Ledum* is nearly circumpolar and was once divided into three species: *L. palustre*, *L. groenlandicum* and *L. decumbens*. Clapham *et al.* (1962) recognised two UK species *L. palustre* and *L. groenlandicum* on the basis of leaf shape, stamen and chromosome numbers. In the New Flora of the British Isles Stace (1997) gives the different forms only subspecies rank: the Eurasian *L. palustre subsp palustre* which occurs across Northern Europe and Asia from Scandinavia through Russia to Japan and the North American *L. palustre var groenlandicum* which is found from Alaska to Greenland. During 2010 the third edition of Stace's New Flora was published and in it the two *Ledum palustre* subspecies have been renamed *Rhododendron tomentosum* and *Rhododendron groenlandicum*; however the more familiar names have been retained in this article to minimise confusion.

The drainage of the Lecropt Moss together with the ruthless uprooting of plants by Edinburgh students for their degree collections left just four plants by 1890. However a hawker calling on the Geddes family reported that he had seen similar plants on many mosses *by way of Lake of Menteith*. Mr Geddes subsequently found six plants on Flanders Moss between Buchlyvie and Gartmore. By 1911 there were only six plants left on Lecropt Moss, which dwindled to three by 1915 and then finally by 1930 the colony had become extinct (Ribbons, 1976). The plants found by Mr Geddes on Flanders Moss also proved elusive and subsequent searches failed to re-find them, though Dr McQueen Cowan from the RBGE reported them near Buchlyvie in 1952.

In 1946 Prof. Walton showed the Glasgow Natural History Society *Ledum* at a different location in Eastern Flanders Moss. A herbarium specimen at the

RBGE dated 1947 described the site as 700 yd due north of South Flanders Farm. This is reasonably consistent with the modern colony centred on NS 6244 9794, 1 km north of the farm buildings. In 1951 Ribbons (1976) reported six plants in the area and by 1963 the colony had expanded to 30 young plants at distances of up to 20 m from the original six. Ribbons suggested their establishment was promoted by the drying of the moss and less frequent burning of the heather. Prof. J. Proctor of Stirling University, in a letter to a fellow botanist, described the colony as 25 m x 25 m in 1973 and by the time Ian Christie (1991) surveyed the colony in 1989 it had increased considerably to 81 bushes occupying an area 200 x 150 m. He also recorded the numbers of plants in each of eight contiguous 50 m x 50 m grid squares which covered the entire colony. This represents a very tiny area (0.2 %) of Flanders Moss SSSI.

Concern that the *Ledum* might rapidly spread across the moss prompted SNH to instigate two excellent Stirling University undergraduate research projects by H.E. Davies in 1991 and A. Ker (Ker, 2005). They both mapped individual plants with reference to grid posts installed on the moss and found that although there had been no increase in numbers since 1989 (Christie, 1991) the area occupied was significantly greater. Ker calculated the colony area was expanding by 7 % per annum. Our own survey (Longrigg and Sexton) in May 2009 used hand-held GPS receivers to find the position of all individual plants including some too small to have been recorded by Christie. 113 plants were found, the majority of which were located between the Grid Eastings 6240 – 6250 and the Northings 9785 – 9800 i.e. an area 150 x 100 m. Of the 113 plants only 13 fell outside the eight 50 m squares recorded by Christie and of these the furthest was 69 m to the west. *Ledum* propagates by rooting its basal branches into the surrounding mossy hummocks. This results in continuous areas of *Ledum* canopy in which it is hard to identify and count individual plants. The largest area (13 x 10 m) is shown in Plate 1. Although we only walked the area immediately around the colony, there appeared to be little long-distance spread by seed which might have endangered the moss; however David Pickett of SNH has reported outlier bushes at NS 6347 9894 and NS 6305 9796.

A further *Ledum* colony was discovered in 1936 by J.R. Aitken bordering the golf course at Callander (Ribbons, 1976). This could not be re-found but according to a herbarium sheet in the RBGE dated 1976 A.R. Cram found a large patch growing in a birch wood by the Doune road on the Callander side of Straid House. Fortunately when the wood was felled this patch was spared conifer afforestation and in 2009 John Snodin relocated the 35 m x 15 m colony centred on NN 6552 0608. Like the Flanders colony it is an almost continuous mat of interlocked plants that have presumably arisen by vegetative propagation. There are a few isolated plants round the edges that could have germinated from seeds, but these are no more than 1.5 m from the main colony so there is certainly no evidence of uncontrolled spread.

Christie (1991) pointed out in a footnote that Ribbons (1976), in his review *Ledum in Britain*, was unaware of the largest local colony which was near Airth

on Dunmore Moss. We have searched the location given by H. Davies in 1991 (NS 875 888) in Dunmore Wood but failed to find the plant, however Dunmore Moss is an extensive area and it could easily be hidden somewhere.

Over the last 150 years there has been considerable debate as to whether our local plants are the European or North American subspecies. They are distinguished in the field by the length to width ratio of the leaves which is 4-12/1 for Eurasian plants and 2.5-5/1 for North American. The stamen numbers also differ, ten being the median for European flowers and eight for North American, however our local counts proved this character was far too variable to be of value taxonomically (i.e. 4-10). The surviving herbarium sheets of plants from Lecropt are interesting. Three clearly have narrow leaves like the Nellie Geddes original Kew specimen so are consistent with the view that the Lecropt plants were *L. palustre subsp palustre*, i.e. of European origin. However there are others (including Dr Paterson's) where the leaves are more like the American subspecies. While there will always be uncertainty about the Lecropt plants, Stace (1997) states emphatically that all current UK colonies are *L. palustre subsp groenlandicum* and our length to width ratios of the leaves are certainly consistent with his conclusion (Flanders moss 3.13:1; Callander 2.75:1).

The hypothesis that *Ledum* might be a native plant has been rejected by all the authorities that have discussed it. Phytogeographically the presence of the North American sub-species rather than the European subspecies would be difficult to explain if it were native. Pollen analysis of peat cores taken from the mosses might have resolved this debate but unfortunately *Ledum* is difficult to distinguish from other Ericaceous pollen.

A Number of Theories have been Proposed for its Presence:

- Nellie Geddes suggested in her letter to Sir Joseph Hooker that the seed might have been carried by birds, a theory that still has adherents. There are a number of winter migrant species that visit from areas where both *Ledum* subspecies grow. However the small seeds are not a food source for any known migratory species although transport on their bodies cannot be ruled out.
- A case can be made that *Ledum* was planted by well meaning naturalists. Apparently Ribbons was told in 1959 that a Dr Beattie of Callander who travelled to Labrador had planted shrubs in bogs near his home. This probably refers to Dr A.J. Beattie who practiced in Callander from 1906-1938. He was also informed by an eminent botanist that the North American subspecies had been erroneously reintroduced into Scotland after the loss of the European subspecies. Perhaps the best evidence for this proposition is that a single large plant of bog laurel *Kalmia polifolia* (another North American bog species) is found adjacent to the main *Ledum* colony on Flanders Moss (NS 6246 9797). However it is argued that *Ledum* is found on too many isolated bogs throughout the UK to be

accounted for in this way (Ribbons, 1976).

- A third theory suggests spread by wind since the seed are adapted for this method of dispersal. After its introduction into cultivation in 1763 *Ledum* was grown both as an attractive shrub and for its herbal properties. The North American subspecies was much more successful as a garden plant and wind blown seed from these cultivated plants would explain why it predominates in the wild. However it seems unlikely that there was cultivated *Ledum* in close proximity to the Flanders colony.

The debate as to whether the *Ledum* on Flanders Moss is native and spreading is of significance when formulating the conservation management plan for the bog. If it is a recent introduction (neophyte) and spreading rapidly, a case can be made for removing it as an aggressive alien. However the data so far would be more consistent with it being defined as a 'low impact neophyte' in which case the removal of invading birch and pine seedlings from the moss would seem a more pressing priority.

The Broad-leaved and Young's Helleborines:

The Broad-leaved Helleborine (*Epipactis helleborine*) is one of our more statuesque native orchids (Plate 2). Typically it is up to 60 cm tall with relatively large strongly ribbed leaves spirally arranged around a robust stem. The flower spike can carry from 10 to 100 flowers which resemble miniature versions (1 cm diameter) of the more popular commercial orchids. The flower is suffused with pink and green and can vary from predominately deep reddish brown in sunny sites to pale pink with yellow green in the shade (Plate 2).

E. helleborine is found scattered in many deciduous woodlands in lowland Scotland where it seems to prefer the better lit fringes of woods and the edges of tracks passing through them. It is a most adaptable plant which will grow in the shady scrub that develops on bings and along road and railway embankments. In 2010 our attention was drawn to a large colony at Grangemouth on the M9 embankment between the motorway and the adjacent A906 just to the SE of the J6 roundabout. We also get reports from the public of helleborines growing in the most unlikely spots. Last summer colonies were found in Stirling University quadrangles, the planted beds in front of Morrison's supermarket, in raised beds around the Springkerse Business Park and the edges of a car park in Alloa. We think that bark mulches may be the source of some of these plants.

The pollination of this orchid fascinated Charles Darwin (1862). Wasps seem drawn to the plant by the sugary nectar which accumulates in a cup shaped depression at the top of the enlarged petal or labellum (Plate 2). On warm dry days you do not have to wait long to see them alighting on the flowers. They probably find the plants by sensing volatiles like eugenol and vanillin which are found in the nectar (Jakubaska et al., 2005). The purple-brown pigmentation

of the nectary may also be involved in close range visual identification since it is associated with other wasp-pollinated flowers like figwort (*Scrophularia nodosa*).

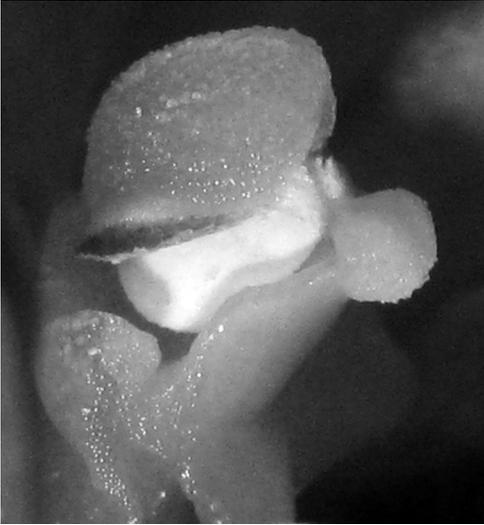


Figure 1 Detail of the centre of a broad-leaved helleborine flower showing the anther sac (top) from which the pollen masses or pollinia have dropped onto the shelf-like rostellum with the spherical glue-secreting viscidium at its tip. The stigma is partly visible at the bottom of the picture.

In the centre of the flower is a single large anther (Figure 1) which over-arches the glistening stigma. Separating the two is a shelf-like projection the 'rostellum' which produces at its tip an opalescent sac or 'viscidium' containing sticky 'glue'. The anther produces two balls of pollen known as 'pollinia' which are released when it splits, allowing them to fall onto the rostellum with their tips touching the glue sac. As the wasps drink the nectar their foreheads touch the viscidium and the two large pollen masses become firmly attached between their antennae (Plate 2, Figure 2). Initially the insects seem agitated by the presence of the pollinia and it is common to see wasps with these obvious yellow lumps on their heads racing round *Epipactis* woodlands. Eventually they are lured back to another plant and leave the pollen from their foreheads on the sticky stigma of the second flower pollinating it. This cross pollination process seems very efficient and usually all the lower flowers on a spike will have been fertilised and their pollinia removed. The shelf-like rostellum also provides a very effective barrier to self pollination preventing pollen from the anther falling directly onto the flower's own stigma. Several studies have shown that self pollination rarely occurs if the flowers spikes are 'bagged' in mesh nets to exclude wasps.

To identify the species of wasp involved in the pollination process Roy Sexton caught 12 wasps visiting local flowers and Craig MacAdam of Buglife identified them. Of the ten that had pollinia attached to their heads nine were tree wasps (*Dolichovespula sylvestris*) and one was a *Dolichovespula* whose species could not be defined. The two that visited the flowers but did not have



Figure 2 The head of a wood wasp with a pair of pollinia attached between its antennae.

pollinia were both common wasps (*Vespula vulgaris*). It is noticeable that some individuals get slow and sluggish if they stay on the flowers for any time and occasionally they fall to the ground disorientated. It has been suggested that they may be getting drunk and a number of studies have shown the nectar contains alcohol. In addition recent analysis has revealed that there are several soporific and narcotic compounds present including morphinans and oxycodone (Jakubsak et al., 2005).

Young's helleborine (*E. youngiana*) is a less robust but distinctive variant of the broad-leaved helleborine. It was initially detected at four sites in Northumberland by Richards and Porter (1975) and was also found a few years later in birch woodland colonising bings in Central Scotland. The two main Scottish colonies are near Blantyre and smaller numbers were also found on the Almond Bing (13 plants, NS 9602 7617) and the Philpstoun Bing (five plants, NT 0574 7659) both near Linlithgow. In 1982 *E. youngiana* was declared a separate species and being one of very few UK endangered endemics was accorded Red Data Book status and full legal conservation protection under Schedule 8 of the Wildlife and Countryside Act (1981). This has significance where planning applications are involved, like the quarrying of spoil. The colony at Almond Bing in Muiravonside Country Park was monitored using fixed point quadrats as part of both Falkirk and UK Priority Species Biodiversity Action Plans.

Superficially the plants look like 'peely wally' (pale, sickly) broad-leaved helleborines. They differ from the latter in that the leaves are pale, un-ribbed, in two ranks, flaccid with undulating margins and with a basal leaf which is >1.1x longer than it is broad. Unfortunately using these characters alone it is impossible to distinguish between *E. youngiana* and 'depauperate' broad-leaved helleborines whose growth has been adversely effected by localised chemical conditions on the bing. The definitive character which separates the two species is provided by the rostellum and viscidium. In *E. youngiana* the viscidium collapses and disappears soon after the flowers open and the pollinia crumble and disintegrate. The equivalent structures in *E. helleborine* remain intact much longer. In the field this is a poor character because wasps quickly find and pollinate depauperate *E. helleborines*, removing the viscidium and pollinia essential for the identification process. It requires a species expert to provide a confident identification.

It was assumed that the breakdown of the pollinia and the loss of the viscidium in *E. youngiana* would interfere with the normal wasp-mediated cross pollination process but allow the pollen to fall onto the flower's own stigma facilitating self pollination. The reproductive isolation resulting from self pollination could account for the rapid biological diversification necessary for the formation of this new species. However not all orchid taxonomists were comfortable with *E. youngiana*'s 'species' status. They found it disconcerting that the plant only seemed to be found on sites together with the common *E. helleborine*. These doubts were reinforced when the variants of individual genes were compared from *E. youngiana* populations and the *E. helleborines* that grew along side them (Harris and Abbott, 1997 and Hollingsworth et al., 2006). Both studies revealed that every population of *E. youngiana* had more genetically in common with the *E. helleborines* on the same site than they did with their fellow *E. youngiana* populations at other sites. Additionally there was little evidence of the genetic isolation associated with self pollination. The *E. youngiana* plants had virtually the same degree of gene variant mixing as the cross-pollinating *E. helleborine*. If legally challenged it would be difficult to establish that *E. youngiana* represented a cohesive, distinct, reproductively isolated species. Consequently as part of the 5th Quinquennial Review of the Wildlife and Countryside Act the Joint Nature Conservation Committee is recommending the removal of *E. youngiana* from the schedule 8 list. In addition most taxonomists are downgrading its status to that of a variety of broad leaved helleborine ie *E. helleborine* var. *youngiana* (Stace, 2010). Several of those who have been contacted for information to write this piece have expressed the hope that the Almond Bing community will not lose its protection and that monitoring will continue (part of Falkirk BAP) since this could still prove to be a rare example of evolution in action.

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FORTH AREA BIRD REPORT 2010

A.E. Thiel and C.J. Pendlebury

This is the 36th bird report for the Forth Area (or Upper Forth). The area covered by the report comprises the council areas of Falkirk, Clackmannan and Stirling but excludes Loch Lomondside and other parts of the Clyde drainage basin as well as the Endrick Water, i.e. Fintry and Balfron, all of which are currently covered by the Clyde bird report.

The report was written by Chris Pendlebury (non-passerines, excluding waders) and Andre Thiel (waders, passerines and escaped/introduced species). Chris Pendlebury, the current SOC recorder, can be contacted by e-mail at chris@upperforthbirds.co.uk, by leaving a message on 07798 711134 or by mail to 3 Sinclair Street, Dunblane FK15 0AH.

The main part of the report consists of detailed species accounts presented in a systematic list arranged in the latest taxonomic order, as adopted by the BOU, and using the now internationally agreed nomenclature for English names of Gill & Wright (2006), as also adopted by the BOU and recommended by the SOC. This is preceded by a summary of the main bird news from 2010 and a Ringing Report, both compiled by Andre Thiel.

ROUND-UP OF THE YEAR

January

The year started very cold with frequent snowfall and some sharp frost in Scotland before becoming less cold towards the end of the month. Overall mean temperatures were 2.0°C to 2.5°C below the 1971-2000 norm. It was not only the coldest January but also the one with the highest number of days of air frost since 1985. Rainfall was well below the average. The year started on the 1st with a Barn Owl in Dunblane, Eurasian Woodcocks at Laighills, Dunblane, and Doune and two Bramblings which were in Dollar for about a week. Long-stayers included the first-winter plumaged Common Loon at Loch Achray from December 2009 which stayed until the 20th and the returning Ring-billed Gull, that first appeared at Kinneil in 2007, on the 10th and the 18th. A Ruddy Turnstone at Kinneil on the 2nd heralded a very good year for the species and was quickly followed by two there on the 11th and four at Bo'ness on the 15th. A Snow Bunting was in South Alloa on the 3rd and the 4th, no doubt pushed there by the adverse weather. There were several records of over-wintering Eurasian Blackcaps during January, the first one of which was seen in Bridge of Allan on the 4th. The same day and locality also saw the first of a run of Eurasian Nuthatch records, which by the end of the year equated to the combined total of records in our area between 1999 and 2009. A Short-eared Owl was at Loch Katrine on the 5th, the same day that eight Eurasian Woodcocks and a Jack

Snipe were at Kinneil. After a quiet period things hotted up again on the 17th with three overwintering Common Greenshanks at Skinflats, a winter-plumaged Mediterranean Gull and 43 Twite at Airth and the only Glaucous Gull of the year, which was seen at Kinneil. Eleven Hooded Crows (all hybrids) at Leny House, Callander on the 19th was the largest flock recorded this year. A different Mediterranean Gull to the one above was on the River Forth at South Alloa on the 23rd and at Kersebrock Farm, Stenhousemuir, on the 30th. Large Chaffinch flocks were again present in the Dunblane area with 950 at Dykedale and 110 at Stonefield on the 24th, as were 170 Eurasian Siskins. The month ended with a Snow Goose at Airth/Skinflats from the 30th to the 10th April, which was only the second record of a bird considered to be of wild origin, though the picture is muddled by the localized presence of feral and escaped birds which travel far afield.

February

February was another very cold and snowy month. The first half was cold with snow showers and overnight frost at times with a brief milder period during the first week. The second half was very cold with locally severe frosts and persistent and heavy snowfalls towards the end of the month. As for January, mean temperatures were 2.0°C to 2.5°C below the 1971-2000 norm. It was the coldest February and the February with the highest number of days with airfrost since 1986. Rainfall was above average along the east coast with over twice the normal amount in places. The start of the month saw the largest flock of Pink-footed Geese of the year with 5000 at Alloa Inch on the 1st. An exceptional count of 548 Willow Ptarmigans was made at snow-covered Cringate Muir on the 5th. On the 7th two Greenland race Greater White-fronted Geese were at Plean. The middle of the month saw a Bittern take up a short residence at Skinflats on the 17th. This is only the second record of this species since 1974. The same day 80 Snow Buntings were counted at Cononish, Tyndrum. Netherton Marsh, Carse of Lecropt, hosted 41 Common Snipe on the 20th and two Rock Ptarmigans were at Stuc a'Chroin on the 21st. A Long-eared Owl was spotted in Thornhill on the 25th. Surprisingly, seven Redwings at Laihills, Dunblane, on the 27th was the last winter record received of this species. A count of 19 Ruddy Turnstones at Bo'ness on the 28th was one of the highest counts of that species in recent years.

March

The first 10 days of March in Scotland were largely fine and settled but fairly cold with sharp night frosts. After this the weather turned more unsettled with rain and strong wind at times. March ended very stormy with significant snowfalls. Mean temperatures were close to the 1971-2000 norm. It was a generally dry month with sunshine totals close to or above average. Fifty-nine Northern Pintails were recorded at Skinflats on the 2nd, the largest flock this year. A Snow Goose at Alloa on the 6th was probably the same bird as seen in the Airth/Skinflats area between late January and early April. Five Rock Ptarmigans were seen at Stob Garbh on the 8th. A Brant Goose at Skinflats on the 12th was one of only two records of this species this year. The 13th saw a

Northern Goshawk fly over Dunblane, while 200 Eurasian Siskins at Carron Valley Reservoir the same day was the largest flock of the year. Six Ruddy Turnstones were at Blackness the following day. A Black (Common) Scoter at Kinneil on the 16th was the 17th record of this species since systematic recording began in 1974. The first signs that spring was around the corner were a Sand Martin in Tillicoultry on the 19th and the last flock of 50 Fieldfares at Carse of Lecropt on the 21st. But winter was still very much holding on, as evidenced by the presence of a large flock of 950 Chaffinches and 20 Bramblings at Dykedale, Dunblane, on the 25th. The same day a White-tailed Eagle was at Argaty. The end of the month saw more spring migrants arrive with a Northern Wheatear at Glen Cononish and a Common Chiffchaff at Holmehill, Dunblane, on the 27th.

April

The first week of April in Scotland was changeable. This was followed by fine weather before turning more unsettled again in the second half of the month. Mean temperatures were 1.0 °C above the 1971-2000 norm. Rainfall was near normal, though it was drier in areas near the east coast. Sunshine totals were 10-20 % above average. The month started with a Jack Snipe on the River Forth at Bridge of Frew on the 1st. The first four Barn Swallows of the year at Carse of Lecropt on the 4th were comparatively late arriving but the first four Common House Martins in Bridge of Allan on the 6th were early. A Black (Common) Scoter at Kinneil on the 8th was probably the same bird as the one recorded there in March. Other migrants arrived on the 10th: Willow Warbler and Eurasian Blackcap at Skinflats, Ring Ouzel at Loch Katrine – the only one seen this year –, while the first records of Common Cuckoo were made at Lanrick, Doune, on the 15th and of Garganey at Cambus on the 16th. Remnant winter visitors included a Whooper Swan at Flanders Moss on the 16th and 30 Snow Buntings at Twisten Hill on the 18th. A colour-ringed Black-tailed Godwit ringed in Iceland and subsequently seen in Ireland and Lincolnshire was spotted at Kinneil, which is a staging post for these birds, on the 20th. There was a strong passage at Skinflats on the 21st that saw three Whimbrel and 71 White Wagtails, including six of the *alba* race. The first Sedge Warbler arrived at Polmaise Lagoons, Fallin, on the 22nd and the first Common Grasshopper Warbler at Skinflats on the 23rd. A Tree Pipit at Beinn Dubhchraig on the 24th was the earliest of a rather late arrival this year. Following a run of Eurasian Nuthatch records since 1999 and the first confirmed breeding record in our area in 2009, there was a second brood at Doune Lodge on the 25th. The first Garden Warbler of the year was logged at Carron Valley Reservoir on the 27th, while a pair of Common Redstarts at Ardcarnaig, L Doine, on the 29th was slightly late.

May

The first half of May was cool due to a northerly/north-easterly wind. There were several showery days and some overnight frost. Temperatures rose from mid-month culminating in a very warm spell between the 20th and the 23rd. The last week temperatures were near normal again with occasional rain or showers, mainly in the north and west. The mean temperatures for May were

close to/slightly below the 1971-2000 norm. May was dry in the west and south-east but near normal in the north and north-east. The beginning of May saw a Spotted Redshank at the Blackdevon wetlands – the only spring migrant of this species –, a slightly late Common Whitethroat at Biggins Farm, Dunblane, and 80 Red Crossbills at Carron Valley Reservoir, the largest flock recorded this year, all on the 2nd. A Whinchat at Sheriffmuir Inn on the 3rd was slightly later than usual, as were the first Common Swifts in Bridge of Allan, Kennet and Skinflats on the 4th. The same day also saw 32 mostly *islandica* Black-tailed Godwits at Skinflats with two Whimbrel at Kinneil on the 5th. The same day three male Wood Warblers arrived at Bracklinn, Callander, also late; this was one of only three records of this declining species. Five Ospreys at Lake of Menteith on the 7th would have been an impressive sight. A pair of Eurasian Nuthatches was confirmed nesting in the same location in Mine Wood, Bridge of Allan, as in 2009 on the 18th, making this the third confirmed nesting attempt in two years. The species appears to have established a toehold in our area and further sightings elsewhere may be an indication that the species will now spread as a breeding species here. This range expansion is somewhat reminiscent of the colonization and subsequent rapid spread by Eurasian Collared Doves in the 1950s and 1960s. A Common Greenshank at Loch Dochart on the 20th was the only one recorded away from the Grangemouth area. On the theme of late arriving migrants, three Spotted Flycatchers made it to Auchessan, Glen Dochart, on the 20th. Finally, a Eurasian Pied Flycatcher at Bracklinn, Callander, on the 29th was surprisingly the only one reported this year.

June

High pressure over/west of the UK brought plenty of fine and dry weather. There were less settled spells in the second week and towards the end of the month. Mean temperatures were 1.0°C to 2.0°C above average. There was below average rainfall, with less than half of normal rainfall in areas near the west and east coasts. June was fairly quiet but Skinflats was the place to be. A Northern Pintail was there on the 3rd. A Lesser Whitethroat, which only sang briefly and typically stayed in dense shrub cover, was found there on the 7th and heard again on the 9th. This represents only the seventh record for the recording area since 1974. Then on the 9th there was a spectacular gathering of at least 500 Common Swifts. A Common Crane flew south at Craigannet Hill, Carron Valley Reservoir on the 10th. Three fully grown juvenile Tawny Owls were found at Ballinluig, Balquhiddy, on the 18th. Back at Skinflats a first-winter Little Gull was present between the 20th and the 27th. A Common Rosefinch at Pool of Muckhart was present between the 21st and the 25th. This is the seventh record of this species in the recording area since 1974, all records having occurred since 1997. A Common Cuckoo egg in a Meadow Pipit nest at Wharry Burn near Cauldham, Sheriffmuir, on the 22nd was a rare find. Finally, a Common Sandpiper, again at Skinflats, on the 23rd was the first autumn migrant of this species followed by three at Kinneil on the 30th.

July

July was unsettled with frequent showers or longer spells of rain. The 4th

was wet and windy with thunderstorms and 52.2 mm of rainfall was recorded at Tyndrum. Cool easterly winds on the 14th saw the temperature in Leuchars, Fife, plummet to 14°C. In contrast a temperature of 21°C was recorded at Gogarbank, Edinburgh, on the 23rd. Despite this, mean temperatures were close to or slightly above the 1971-2000 norms. July was very wet with over twice the normal amount of rainfall recorded in eastern Scotland, making it the fourth wettest month in 100 years. The traditional passage sites of Skinflats and Kinneil were the hotspots in July. Wader passage continued at Skinflats with a Common Greenshank on the 3rd, rising to three there on the 21st and 3 at the tidal exchange on the 26th. A Little Gull was there on the 9th. The only Common Quail of the year was one heard calling at Flanders Moss on the 14th. Common Sandpipers were recorded on passage at Skinflats on the 15th with six there on the 18th, five at Kinneil on the 22nd and five at Loch Venachar on the 23rd. A Little Egret appeared in the Grangemouth area on the 20th where it would range between the Kincardine Bridge, Skinflats tidal exchange, Skinflats and Kinneil until the 23rd November. Single Whimbrel passed Skinflats tidal exchange on the 21st and Kinneil on the 22nd. Fourteen Ruddy Turnstones at Kinneil the same day was a good count. Two days later an adult Little Stint was at Kinneil where it stayed till the 25th, the day a Little Ringed Plover was logged at Skinflats.

August

August was dominated by changeable weather with plenty of cloud and showers and widespread rain at times. Bishopton, Glasgow, saw temperatures of 23°C on the 7th and the 15th. The mean temperature was, however, somewhat below the 1971-2000 average and it was the coolest August since 1998, though similar to August 2007. Rainfall ranged from more than 30% above average in parts of the north-east to 25% below normal in parts of the south and west. Overall it was much drier than the last three Augusts. Not to be outdone by its neighbour, Kinneil scored highest in August. A Whimbrel was on passage at Skinflats tidal exchange on the 1st, the same day that five Common Sandpipers were at the Avon mouth, Kinneil, increasing to six on the 6th. On the latter day the last recorded Grasshopper Warbler of the year was singing at Skinflats. Good numbers of Common Greenshanks were present throughout August with maxima of seven at Kinneil on the 8th and the 26th and a Ruddy Turnstone was also there on the 8th. A sure sign that the breeding season was over was the last Common Swift in Bo'ness on the 13th. A Garganey at Kinneil and Skinflats on the 13th was the third of the year. Other early leavers were the last five Sedge Warblers and the last three Common Whitethroats at Kinneil on the 14th where up to two Spotted Redshanks were recorded from the 19th onwards. The same day, the Ring-billed Gull from 2007 returned to Kinneil for its fourth consecutive autumn/winter stay.

September

September was changeable with some warm days in the first half and localised frosts during the last week, temperatures in Tyndrum dropping to -4°C on the 26th. Some overnight temperatures during the last week were the lowest for September in the last 20-30 years. Despite this, mean

temperatures were about 1.0°C above the 1971-2000 average. Rainfall was close to average in most parts but over 150 % of normal fell in some areas, such as north Aberdeenshire and Fife. Tyndrum saw 50 mm of rainfall in 24 hours on the 13th. The Spotted Redshanks from August remained at Kinneil to the 24th. Seawatching at Bo'ness on the 7th was productive with 12 Parasitic Jaegers and a Northern Fulmar passing by. The same day the last 20 Sand Martins were logged in Dunblane. The 8th was another good day, this time for waders, with two Whimbrel at Skinflats tidal exchange, a Sanderling and a Little Stint at Kinneil and the start of an excellent Curlew Sandpiper passage with eight at Kinneil, which increased to 19 at Skinflats on the 11th. There was a noticeable passage of Meadow Pipits on the 9th with 120 birds at Powfoulis and 40 at the Skinflats tidal exchange. An immature White-tailed Eagle from the Fife reintroduction programme frequented the Skinflats area from the 9th into October. The period just after mid-month was memorable, starting on the 18th with a Long-eared Owl near Dollar, the first returning 15 Whooper Swans at Gartmorn Dam, the last Eurasian Blackcap and a good count of 31 Northern Gannets at Kinneil. A Black-necked Grebe was found at the River Carron, Larbert, on the 19th, only the second for the recording area. The same day the last Whinchat of the year was at Cardross Bridge, Flanders Moss, the last Spotted Flycatcher at Skinflats tidal exchange, which was rather late, and two Brant Geese at Kinneil, while an impressive 94 Red-throated Loons were logged flying over Skinflats. The second record of Grey Phalarope for the recording area, at Skinflats on the 19th and the 20th, came almost exactly 19 years after the first at Tullibody Inch. On the 20th two Arctic Loons were seen at an undisclosed location in the Trossachs and a count of 448 Canada Geese at Loch Rusky was the highest ever in our recording area. A colour-marked Black-tailed Godwit ringed in Sakka, Iceland, was seen at Kinneil on the 25th. A Great Skua flew over Kinneil on the 26th and two Little Egrets arrived there on the 30th and stayed into October.

October

October saw widely varying temperatures. There were a few warm days, such as the 7th when Gogarbank, Edinburgh, reached 18°C, while on the 12th Glasgow only saw a temperature of 9°C, and some chilly nights with a few early season frosts, with temperatures in Tyndrum early on the 20th dropping to -5°C. Overall, however, temperatures were near normal. Rainfall was also near normal with the majority falling in the latter part of the month, with Tyndrum recording 48 mm in 24 hours on the 29th. October was marked by a cross-over between the last summer migrants leaving and the first winter visitors returning. The month started with a White tailed Eagle at Aberfoyle on the 1st and the first Redwing of the winter at Kippenross, Dunblane, on the 2nd. The 3rd saw the last, rather late departing, Barn Swallows at Ashfield and in Dunblane and Willow Warblers at Kinneil. Likewise Common Chiffchaffs at Burghmuir and Broomridge, Stirling, on the 4th were the last of the year. A flock of 600 Greylag Geese at South Alloa on the 5th/6th was the largest counted this year. A Curlew Sandpiper at Kinneil on the 9th was the last one seen, while at least two Jack Snipe were at the Carse of Lecropt the next day. Continuing the

theme of arrivals and departures, a Northern Wheatear at Stob Binnein, Crianlarich, on the 11th was the last of the year, while two Common House Martins at Cambus Pools on the 12th were by up to a month later than in the previous 5 years. If any reminders were needed that autumn had truly arrived, it came in the form of 68 Barnacle Geese at Skinflats on the 13th and the return of the drake Green-winged Teal to Kinneil on the 14th. This bird has wintered there annually since 2006. The Mediterranean Gull first seen in January at Airth, South Alloa and Stenhousemuir was seen again in South Alloa on the 17th, the same day that 25 Fieldfares arrived at Kinneil. The latter heralded arrivals of flocks numbering a few hundred, culminating in a massive flock of at least 1,500 birds at the Blackdevon wetlands on the 26th. Ten Bramblings were at Loch Watston on the 17th and the 18th saw the vanguard of another large arrival, this time of Bohemian Waxwings, with 18 birds spotted in Bo'ness. However, this year there was a rapid build-up until late November after which most birds continued south. A second immature White-tailed Eagle from the Fife reintroduction scheme was seen at King's Seat, Ochils, on the 31st.

November

An unsettled month with showers or longer periods of rain and strong winds at times. The second half of the month turned colder and the last week was very cold with sharp frosts and frequent snow showers in the east. The average temperature for November was 1.9°C below the 1971-2000 norm, making November the coldest month since 1985. Rainfall was at least 50 % above normal in the east. A band of rain on the 11th deposited 47 mm of rainfall at Tyndrum in 24 hours. November was marked by large flocks of birds. It started with a Common Chiffchaff in Fallin, no doubt an overwintering bird, and a Eurasian Rock Pipit at Skinflats. The 2nd saw the largest flock of Bohemian Waxwings of the year, 875 in number, in Dunblane. A Snow Bunting was seen at Airth on the 4th and a European race Greater White-fronted Goose at Skinflats on the 11th. The large flocks of Chaffinches in the Dunblane area were again present at Stonehill with 750 there on the 13th. Fifty-eight Common Snipe at Netherton Marsh, Carse of Lecropt, on the 14th was an excellent count, as was a count of 35 Rock Ptarmigans at Ben Challum the same day. The Bean Goose flock peaked at 232 at Parkhead on the 18th. The next day saw a flock of about 500 Fieldfares at the Dollar-Tillicoultry stretch of the River Devon. Some 150 Lesser Redpoll at Kinneil on the 20th was the largest flock of this species seen this year, as was a Dunlin WeBS count of 4770 at Skinflats on the 21st. The same day 31 Red-breasted Merganser were on the River Forth at South Alloa and 40 Twite at Skinflats on the 23rd. Conversely, 17 Common Pochards at the Lake of Menteith on the 23rd was surprisingly the largest count this year of this declining species. Back to large flocks and 380 Common Linnets at Stonehill, Dunblane on the 27th. The month finished with ten Bramblings in Aberfoyle on the 28th.

December

December was exceptionally cold with mean temperatures on the mainland about 5°C below the 1971-2000 norm. Strathallan, Perthshire, recorded a

temperature of -18°C on the 7th and even in the Glasgow and Edinburgh areas the temperature did not climb above -5°C . It was the coldest December in 100 years and the second coldest calendar month on record after February 1947. There were severe frosts and the number of days with air frost was the highest in December for over 50 years. Although December was the fifth driest in 100 years, precipitation was close to average in parts of eastern Scotland. Much of this fell as snow, especially in the first and third week. Nunraw Abbey in the Lothians recorded 54 cm of snow on the 7th. It was also the second sunniest December since 1929. A Little Auk off Bo'ness, the eighth record of this species, started off the month on the 1st. On the 4th 60 Snow Buntings were seen at Craig Leith, Alva. Things then turned quite until the 16th when up to two Eurasian Rock Pipits were at Skinflats followed by one at Blackness on the 17th. The same day two Ruddy Turnstones were logged at Blackness. The 19th produced good counts of 40 Common Snipe on the West Row-Forth confluence stretch of the River Teith and 51 Common Mergansers on the River Forth at Stirling, the highest inland count. Very few Bohemian Waxwings stayed into December, the last one being a single bird in Fallin on the 25th. The Common Linnets at Stonehill, Dunblane, which made use of seeded kale, grew to 950 on the 25th. The year finished with a Brambling at Ashfield on the 30th and a Eurasian Blackcap in Bridge of Allan and 31 Greater Scaup off Kinneil/Bo'ness on the 31st.

RECORD SUBMISSION AND REPORT FORMAT

Annual Bird Reports depend largely on contributions from the local birdwatching community. Due to the ever growing (and welcome) volume of data that are submitted, some data that may be of relevance in one year may not be so in another year. Whether or not a particular record is included is determined to a large degree by the space allocated to the bird report in any one year. This should, however, not discourage contributors from submitting data that they feel are of relevance to their local area, as it will only become obvious whether a particular record should be included once the entire dataset is available. Several observers send in a list largely or entirely for their home locality. Much of this information is not suitable for inclusion in these annual reports but is valuable to have on record, e.g. for conservation action. These data are kept in a special file. There are fifteen such lists from across the whole district, ranging from Falkirk to Killin. Several contributors send in data, often of common species, from repeated transect visits to the same locality, e.g. Airthrey, Bridge of Allan; King's Park, Stirling, etc. This has become more common since the advent of the BTO's Birdtrack on-line project. Such data reflect birds per walked route rather than flock sizes. These data are especially useful, if collected repeatedly and using the same effort between visits and years, in which case they allow valid comparisons between seasons and years to be made. Contributors are therefore encouraged to provide a measure of effort, e.g. duration of visit, length of transect, something that is currently often lacking.

Assessment of autumn wader passage is done by adding up the maximum number of birds recorded in each successive half month for all distinct sites.

The aim is to eliminate as far as possible the distorting effect of using total bird-days where observer coverage and effort can vary significantly between sites and months. The figures are thus an estimate of the minimum number of birds in each half month. The procedure is likely to underestimate the true total during periods of high turn-over and to overestimate it when birds stay on and are double-counted in successive half months. There is no practical way of quantifying these effects, although the data for well covered sites occasionally show clear examples of both.

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, as it greatly speeds up cross-checking and summarizing of data. A standard spreadsheet is available from Chris Pendlebury. The vast majority of contributors now submit their data in this format, which is most appreciated.

Following past appeals for more complete information, most records now include the name of the nearest village and an increasing number of records are also submitted with 6-figure grid references. This is very much appreciated, as it enormously speeds up cross-checks and is a valuable resource for conservation action.

The sometimes sparse information available for some common breeding species is augmented by data from the Breeding Birds Survey (BBS). For less common species data can sometimes be summarized in terms of the numbers of pairs or apparently occupied territories for particular locations. The organizers for both the estuary and the inland waters parts of the national wetland bird survey (WeBS) have also made available the results from these for this report. Where appropriate, these data are included in the species accounts.

For some species the records sent in are unrepresentative of their general distribution. This applies particularly to common species or to those that are secretive or breed in inaccessible locations. The status of species is detailed in a check list, published previously in the *Forth Naturalist and Historian*, Vol 15. In this report a coded summary of general distribution is included after the species name. This sometimes apparently contradicts the records that follow the species account. This is, however, merely a reflection of the number of records submitted for any particular year. The codes used in this report are:

- B Breeding status: widespread (present in more than five 10 km squares)
- b Breeding status: local, scarce (present in fewer than five 10 km squares)
- W Winter status: widespread or often in groups of more than ten
- w Winter status: local, scarce or usually fewer than ten in a group
- P or p Passage (used for species usually absent in winter); P and p used for widespread and local/scarce, respectively, as in winter status above

S or s Summer visitor (used for species present in summer but which do not normally breed); S and s used for widespread and local/scarce, respectively, as in winter status above.

Thus, BW would be appropriate for European Robin, B for Barn Swallow, p for Ruff and SW for Great Cormorant. No status letter is used if a species occurs less than annually.

Vetting of records of species that are locally rare or otherwise notable is carried out by a panel of five members, which currently consists of C. Pendlebury, C. Henty, D. Orr-Ewing, D. Douglas and A. McIver. The panel has produced a list of species, the records of which need to be supported by either a full description or sufficient evidence to remove any reasonable doubt. The list is available from Chris Pendlebury. Any species which is a vagrant to the area and some of those which are asterisked (*) in this report fall into this category. At the discretion of the panel a description may also be required for more common species. The first twenty occurrences of a species in the recording area are highlighted. Vetting of Scottish rarities is done by the Scottish Birds Rarities Committee (SBRC; see Lesser Spotted Woodpecker update later in this report) and of national rarities by the British Birds Rarities Committee (BBRC). Descriptions need to be submitted to these committees, as appropriate.

The British Ornithologists' Union (BOU) has appealed in the past for introduced/escaped species to be recorded locally. As the published information on these species is not necessarily complete, it is important to monitor changes in the status of these species more accurately. The BOU therefore encourages observers to record and monitor all naturalized species (particularly but not exclusively breeding records and interactions with native species) and escaped species seen in the wild to assist it in making future recommendations for category C status of the British list, if a self-sustaining, naturalized population is established.

Finally, an appeal for photos of rare, uncommon or otherwise noteworthy birds. All good quality photos will be considered for inclusion in the report, subject to space limitations.

The following abbreviations have been used in this report: Ad(s) - adult(s), AoT - apparently occupied territory, b/lkm - birds per linear kilometre, Br - bridge, BoA - Bridge of Allan, BoD - Braes of Doune, ca - circa, c/n - clutch of n eggs, conf - confluence, BBS - Breeding Bird Survey, CP - Country Park, E - east, Est - estuary, Fm - farm, F - Female, G - Glen, GP - gravel pit, imm - immature, incl - including, juv - juvenile, L - Loch, N - north, NR - Nature Reserve, nr - near, M - Male, max - maximum, ON - on nest; pr - pair; Res - Reservoir, R - river, Rd - road, S - south, SP - summer plumage, W - west, WeBS - Wetland Bird Survey, Y - young, > flying/flew.

CONTRIBUTORS

This report has been compiled from records submitted by the contributors listed below. Where initials are given, the contributors are listed in the species entries of birds which are rare, uncommon or otherwise noteworthy.

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Thanks go to all of the above as well as to M. Bell and N. Bielby who made available WeBS and BBS count data. Apologies to anybody who has been inadvertently missed out of the above list.

RINGING REPORT

This is the seventh ringing report. The following section lists birds ringed and/or reported in the recording area during 2010 (plus some earlier ones). A large part of these come from the BTO web site. Contributors are encouraged to report all ringed, especially colour-ringed, birds to the relevant organizers 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 the understanding of bird ecology and migration patterns. In addition data should also be submitted to the bird recorder for inclusion in the bird report.

During 2010 twenty-nine reports of birds ringed or recovered in the recording area, involving 17 species, were submitted, as follows:

	Number of reports	Number of species
Birds ringed in Forth Area and recovered elsewhere	9	7
Birds ringed elsewhere and recovered in Forth Area	8	5
Birds ringed and recovered in Forth Area	7	6

Recoveries are listed in the same order as for the systematic list. After the species heading, data are presented as follows:

Ring number	Date ringed	Location ringed	Observer
	Date recovered	Location recovered	Distance and direction

Additional information

• **MUTE SWAN**

Z80610	21 Aug 1993	Union Canal, Lathallan	BTO
	08 Jan 2010	Union Canal, Linlithgow (West Lothian)	7 km E

Ringed as a nestling. Found freshly dead.

• **GREAT CORMORANT**

5149142	20 Jun 2010	Rockcliffe Marsh (Cumbria)	BTO
	04 Sep 2010	Old Polmaise Estate, Fallin	136 km NNW

Ringed as a nestling. Shot.

• **RED KITE**

GC36393	15 Jun 2008	Argaty, BoD	BTO
	27 Apr 2010	BoD wind farm	8 km N

Ringed as a nestling. Dead.

	Summer 2010	Argaty, BoD	RSPB
	1 Dec 2010	L Assapol, Mull	

Tagged as a nestling.

• **EURASIAN SPARROWHAWK**

EL75208	02 Jul 2010	Tamaviod	BTO
	01 Sep 2010	Cumbernauld (Strathclyde)	31 km SSE

Ringed as a nestling female. Found freshly dead (hit glass).

• **COMMON BUZZARD**

MA16714	16 Jun 2010	Argaty, BoD	BTO
	05 Dec 2010	Lamlash (Strathclyde)	100 km SW

Ringed as a nestling. Wing-tag seen.

• **OSPREY**

G8361	12 Jul 2000	Confidential site, near Doune	BTO
	03 Apr 2009	Burton (Cheshire)	333 km S

Ringed as a nestling. Colour rings seen.

1366586	07 Jul 2008	L Ard Forest	BTO
	11 May 2010	Neilston, near Glasgow (Strathclyde)	43 km S

Ringed as a nestling. Alive.

1412301	28 Jun 2008	Confidential site, near Killin	BTO
	25 May 2010	Balgavies L (Tayside)	97 km E

Ringed as a nestling. Colour rings seen.

•COMMON KESTREL

ER88721 15 Jun 2010 Confidential site, North Bank BTO
 05 Dec 2010 Aberfoyle Forest 54 km WNW

Ringed as a nestling. Freshly dead (natural causes).

•NORTHERN LAPWING

DD06584 04 Jun 2006 Townhead, North Third BTO
 18 May 2010 Townhead Fm, Shielbrae 0 km

Ringed as a nestling. Freshly dead.

•BLACK-TAILED GODWIT

WN-GO 5 Jul 2006 Langhús, Fljót, Skagafjörður, N ICELAND DT
 31 Jan 2008 Slatty's Bridge, Glounthaune Station, Cork,
IRELAND
 25 Jun 2008 Alkborough Flats, Lincolnshire
 20 Apr 2010 Kinneil

Orange/Yellow 13 Jul 2009 Sakka, Svarfardalur, Dalvik, ICELAND DT
 Orange/Redflag 15 Sep 2009 Harra, Orkney
 08 Aug 2010 The Shunan, West Mainland, Orkney
 25 Sep 2010 Kinneil

•BARN OWL

GN66841 24 Jun 2010 L Ard Forest BTO
 08 Dec 2010 Drummore, Stranraer (Dumfries & Galloway) 166 km S

Ringed as a nestling. Sick (hit by car).

•TAWNY OWL

GC66834 06 Jun 2010 L Ard Forest BTO
 18 Jun 2010 L Chon 8 km NW

Ringed as a nestling. Injured.

•GREAT SPOTTED WOODPECKER

CH79876 10 Jul 2008 Woodhouse, Easter Howgate (Lothians) BTO
 20 Mar 2010 Baquhatstone, Slamannan 38 km W

Ringed as an adult male. Found freshly dead.

•BLUE TIT

V561988 18 Mar 2009 Callander BTO
 18 Apr 2010 Near Callander 0 km

Ringed as an adult. Found freshly dead (hit by car).

•GREAT TIT

TC80010 30 May 2010 Lendrick W, Brig O'Turk BTO
 23 Nov 2010 Brig O'Turk 0 km

Ringed as a nestling. Freshly dead (caught by cat)

V674892 13 Feb 2008 Menteith Cottage, Aberfoyle BTO
 10 Jun 2010 Duke's Pass, Aberfoyle 2 km

Ringed as a first-year female. Freshly dead (caught by cat)

X420597 20 Sep 2008 Menteith Cottage, Aberfoyle BTO
 17 Apr 2009 Tarbet, Cnoc, L Lomond (Strathclyde) 19 km W

Caught by ringer

	01 Oct 2009	Tarbet, Cnoc, L Lomond (Strathclyde)	19 km W
Caught by ringer	21 Mar 2010	Tarbet, Cnoc, L Lomond (Strathclyde)	19 km W
Caught by ringer			

•COMMON STARLING

LB50039	08 Nov 2009	Wellington Park, Montrose (Tayside)	BTO
	27 May 2010	Larbert, Falkirk	116 km SW
Ringed as a full-grown female. Freshly dead (caught by cat)			

•EURASIAN SISKIN

X113748	24 Mar 2009	Amberley (Gloucestershire)	BTO
	06 Apr 2010	Aberfoyle Forest	516 km NNW
Ringed as first-year male. Caught by ringer.			

V328139	17 Apr 2009	Warsop (Nottinghamshire)	BTO
	05 Apr 2010	Aberfoyle Forest	389 km NNW
Ringed as a first-year male. Caught by ringer.			

R444861	21 Feb 2010	Orrell (Wigan)	BTO
	05 Apr 2010	Aberfoyle Forest	314 km NNW
Ringed as an adult male. Caught by ringer.			

BLB111156601	14 Feb 2009	Zele Heikant, Oost-Vlaanderen, BELGIUM	BTO
	21 Jun 2009	Braentrian, Ardeonaig	807 km NW
Ringed as a full-grown male. Caught by ringer.			

UPDATE – LESSER SPOTTED WOODPECKER

The SBRC has recently reviewed the only accepted record of Lesser Spotted Woodpecker (*Dendrocopos minor*) on the Scottish List. This referred to two birds seen on 23rd September 1968 near Aberfoyle. Lesser Spotted Woodpeckers had apparently also been seen on a few occasions on a bird table in a garden there in the autumn and winter months of 1966-67. No birds were seen in 1969 but three Lesser Spotted Woodpeckers returned on 5th and 6th January 1970 in hard frost and deep snow (*Scottish Birds*, 6: 210-212). Following previous erroneous claims of Lesser Spotted Woodpeckers elsewhere, SBRC was initially reluctant to accept the 1966-68 records but the description provided of the three 1970 birds, thought to be of the *D. m. minor* northern race, convinced the SBRC, which accepted it as the first record of Lesser Spotted Woodpecker onto the Scottish List. However, a recent review of this record by the SBRC has led to its rejection. As this was the only record of Lesser Spotted Woodpecker in Scotland, the species has been removed from the Scottish List. Consequently it is also no longer part of the Forth list.

SYSTEMATIC LIST

Codes - S, F and C refer to Stirling, Falkirk and Clackmannanshire Council Areas.

MUTE SWAN *Cygnus olor* (B,W)

Inland WeBS counts: 277 in Jan, 219 in Feb, 177 in Mar, 218 in Sep, 255 in Oct, 200 in Nov and 156 in Dec.

Forth Est (WeBS): 13 in Jan, 5 in Feb, 9 in Mar, 6 in Sep, 9 in Oct, 12 in Nov and 11 in Dec.

F Breeding: pr and 3 Y Callendar Park, Falkirk and pr and 4 Y Kinneil House pond 18 Sep; pr and 5 Y Forth/Clyde canal, Bonnybridge 19 Sep. Max: 28 Skinflats 24 Apr.

- C Breeding: pr and 6 Y Gartmorn Dam 27 Jul; pr and 1 Y Aberdona 9 Sep; 2 pr and 5 Y each R Devon, Alva 19 Sep; pr and 6 Y Blackdevon wetlands 23 Nov. Site max: 30 Gartmorn 14 Mar and 42 on 12 Oct; 32 R Devon, Tullibody 15 Dec; 21 R Devon, Alva 19 Dec.
- S Breeding: pr and 3 Y Howietoun Fisheries May-Sep; pr and 6 Y Ochlochry Pond, Dunblane Aug/Sep; pr and 3 Y Coustry Pond, Blairdrummond 6 Sep; pr and 2 Y Cromlix 6 Sep; pr and 3 Y Brae of Cessintully pond, Thornhill 20 Sep; 4 ads and 7 Y Cambusmore 26 Sep. Site max: 100 Airthrey L, BoA 4 Mar; 101 Lecropt Carse 23 Dec.
- WHOOPEE SWAN *Cygnus cygnus* (W)
 Inland WeBS counts: 21 in Jan, 33 in Feb, 36 in Mar, 0 in Sep, 14 in Oct, 44 in Nov and 2 in Dec.
- F Winter/spring: 5 Airth 30 Jan; 5 Stenhousemuir 7 Feb. Autumn/winter max: ad Skinflats 19 Sep, increasing to 10 by 31 Oct; 7 Kinneil 23 Oct and Airth 3 Nov.
- C Two ads Blackgrange 12 Feb. 20 Gartmorn Dam 9 Mar with 15 there 18 Sep. 4 Blackgrange 10 Oct.
- S Winter/spring max: 7 L Lubnaig 9 Jan; 17 L Dochart 3 Feb; 3 L Coulter 21 Feb; 18 R Forth, Craigforth 14 Mar; 1 Flanders Moss 16 Apr; 4 Lecropt Carse 10 Oct. Autumn/winter max: 22 Carron Valley Res 19 Nov; 7 L Lubhair Nov/Dec; 7 Lecropt Carse 24 Dec.
- BEAN GOOSE *Anser fabalis* (W)
 F Recorded in the vicinity of the Slamannan Plateau. Winter/spring, Slamannan: maxima of 30 in Jan and 74 in Feb (AMF, DBr). Autumn/winter: max 213 by Slamannan 11 Nov, 232 Parkhead 18 Nov (RS, BRG).
- PINK-FOOTED GOOSE *Anser brachyrhynchus* (W)
 Spring departure: 12 Skinflats 4 May. Autumn arrival: 22 over Gartmorn CP 14 Sep.
 Forth Est (WeBS): 229 in Jan, 1068 in Feb, 977 in Mar, 325 in Sep, 2 in Oct, 67 in Nov and 0 in Dec.
- F Winter/spring max: 4100 Dunmore 2 Mar. Autumn/winter max: 4650 Airth 10 Oct.
- C Winter/spring max: 5000 Alloa Inch 1 Feb. Autumn/winter max: 1500 Cambus 12 Oct.
- S Winter/spring max: 2000 Plean 7 Feb; 2000 Thornhill 10 Feb; 2630 Manor Powis 8 Mar. Summer: 1 Deanston 1 Jun. Autumn/winter max: 1400 Cowie 8 Oct; 1669 Aberfoyle 23 Nov; 600 Cambuskenneth 2 Dec.
- GREATER WHITE-FRONTED GOOSE *Anser albifrons*
 F One European race bird Skinflats 11 Nov (RS).
 S Two Greenland race birds Plean 7 Feb (DT).
- GREYLAG GOOSE *Anser anser* (b, W)
 Spring departure and autumn arrival are muddled by the presence of resident feral birds.
 Forth Est (WeBS): 39 in Jan, 37 in Feb, 2 in Mar, 488 in Sep, 15 in Oct, 70 in Nov and 1 in Dec.
- F Winter/spring max: 50 Skinflats 7 Feb. Summer max (feral): 200 Skinflats 15 Aug. Autumn/winter max: 100 Skinflats 12 Sep; 600 S Alloa 5/6 Oct.
- C Winter/spring max: 272 Cambus 10 Jan; 190 Gartmorn Dam 14 Mar. Summer: 1 Gartmorn Dam 17 Jun. Autumn/winter max: 350 Blackgrange 10 Oct; 328 Alva 19 Nov.
- S Winter/spring: 100 Plean 7 Feb; 46 between Airthrey L, Ashfield, Lecropt Carse and Manor Powis in Feb/Mar. Summer: 160 Carron Valley Res 29 Jun. Autumn/winter: 111 Fallin 25 Sep, 113 L Watston 7 Nov, 118 Carron Valley Res 19 Nov, 65 Lecropt Carse 24 Dec.

*SNOW GOOSE *Anser caerulescens*

- F One Airth/Skinflats 30 Jan to 10 Apr (GG, AB *et al.*).
 C One Alloa 6 Mar (JSN, CJP).

Altogether there have been 13 records of this species, involving an estimated 9-10 separate occurrences. Most, if not all, of these were probably escapees. The above records were assessed by the Upper Forth Rareties Committee and are only the 2nd and 3rd records of birds considered to be of wild origin, though probably involved the same bird.

CANADA GOOSE *Branta canadensis* (b W)

- Inland WeBS counts: 394 in Jan, 180 in Feb, 97 in Mar, 977 in Sep, 761 in Oct, 420 in Nov and 208 in Dec.
 Forth Est (WeBS): 0 in Jan, 0 in Feb, 6 in Mar, 4 in Sep, 28 in Oct, 3 in Nov and 0 in Dec.
 F Max: 60 Skinflats 12 Sep; 77 St Helen's L, Bonnybridge 2 Oct; 350 S Alloa 5 Oct; 145 Little Denny Res 1 Nov.
 C Max: 11 Gartmorn Dam 19 Sep with 2 pairs there 7 Apr.
 S Breeding: pr ON Auchenlaich, Callander 4 May; 5 Y Sauchinburn House, Bannockburn 24 May. Max: 78 Ashfield 20 Feb; 297 L Coulter 1 Sep. 448 L Rusky 20 Sep (new high count for recording area); 64 N Third Res 23 Sep; 400 L Venachar 14 Oct; 163 Lake of Menteith 23 Nov.

*BARNACLE GOOSE *Branta leucopsis* (w)

The picture is muddled by feral birds. In our area there is no way of distinguishing between wild migrants and feral birds resident in Britain.

- F Skinflats: 2 on 17 Jan, 1-4 in Feb, 4-5 on 1-14 Mar (MVB, AB *et al.*). Airth/Dunmore: 1 on 30 Jan, 6 on 13 Feb, 2 on 2 Mar (DT, MVB). Oct: max at S Alloa of 17 on 6th (ACC); 68 Skinflats on 13th and 68 Airth on 15th (SP).
 C Two Haugh of Blackgrange 1 Jan (BD). 3 Alloa 1 Feb. 4 Kennet Pans 14 Feb with 1 there 14 Mar (MVB). 3 Tullibody 7 Mar.
 S Two Plean 7 Feb (DT). Tullibody: 3 on 8 Mar and 2 on 16 Mar (MVB, KW). 1 Cowie 8 Oct (BD). 4 Aberfoyle 20 Oct (NB). 8 Drip Moss 3 Nov (NB).

*BRANT GOOSE (BRENT GOOSE) *Branta bernicla*

- F One Skinflats 12 March (EG). 2 Kinneil 19 Sep (JRC).

COMMON SHELDUCK *Tadorna tadorna* (b, W)

- Forth Est (WeBS): 664 in Jan, 636 in Feb, 574 in Mar, 2451 in Sep, 1954 in Oct, 554 in Nov and 307 in Dec.
 F Moulting flock: 4095 Kinneil and 374 Skinflats 6 Aug, included total of 210 juvs (MVB).
 C Max: 30 Blackdevon wetlands 26 Apr; 35 R Forth, Cambus 21 Nov.
 S Pr Plean CP 5 Jul.

EURASIAN WIGEON *Anas penelope* (b, W)

- Inland WeBS counts: 184 in Jan, 237 in Feb, 176 in Mar, 90 in Sep, 194 in Oct, 199 in Nov and 40 in Dec.
 Forth Est (WeBS): 483 in Jan, 217 in Feb, 260 in Mar, 9 in Sep, 206 in Oct, 301 in Nov and 330 in Dec.
 F Winter/spring max: 180 S Alloa and 120 Kinneil 17 Jan; 100 Skinflats 26 Feb. Summer: 1-2 M Skinflats May to Jun. Autumn/winter max: 123 S Alloa 7 Oct; 74 Skinflats 21 Nov; 118 Bo'ness 18 Dec; 105 Kinneil 31 Dec.
 C Winter/spring max: 68 R Devon, Dollar 23 Jan; 143 R Forth, Alloa 8 Mar; 20 Gartmorn Dam 9 Mar. Autumn/winter max: 18 Gartmorn Dam 19 Nov; 66 Blackdevon wetlands 23 Nov.
 S Winter/spring max: 69 Lecropt Carse 24 Jan. Autumn/winter max: 62 L Dochart/Lubhair 16 Oct; 70 Cambusmore 21 Nov.

GADWALL *Anas strepera* (s, w)

- F Two Kinneil 14 Feb (JRC). Skinflats: pr on 24 Apr; 5 on 3 Jul (AB, GG). 2 Kinneil 25 Sep and 4 Oct (DT). 2 S Alloa 4 Dec (BD).
- C Cambus: M 8 Mar, pr 21 Apr and 22 May, 1 on 24 Sep and 3 on 21 Dec (CJH, MVB, ACC). Gartmorn Dam: 1 on 9 Mar and 2 on 22 Apr (PA).
- S Two R Forth, Fallin 20 Feb (ACC).

EURASIAN TEAL *Anas crecca* (b, W)

- Inland WeBS counts: 904 in Jan, 966 in Feb, 767 in Mar, 445 in Sep, 987 in Oct, 810 in Nov and 823 in Dec.
- Forth Est (WeBS): 1140 in Jan, 1428 in Feb, 1114 in Mar, 482 in Sep, 866 in Oct, 921 in Nov and 849 in Dec.
- F Winter/spring max: 842 Kinneil 14 Feb. Autumn/winter max: 323 Skinflats and 454 Kinneil 19 Dec.
- C Winter/spring max: 55 R Devon, Dollar 23 Jan; 50 Cambus 8 Feb; 159 R Forth, Alloa 8 Mar. Autumn/winter max: 183 Kennet Pans 19 Sep; 82 Silverhills Pond, Kersiepow 10 Oct; 120 Blackdevon wetlands 19 Dec.
- S Winter/spring max: 91 L Coulter 29 Jan; 411 R Forth, Stirling/Fallin 20 Feb; 102 L Venachar 7 Mar. Summer: 2 Carron Valley Res 29 Jun. Autumn/winter max: 140 L Venachar 14 Oct; 85 L Dochart/Lubhair 16 Oct; 166 R Forth, Stirling 19 Dec

*GREEN-WINGED TEAL *Anas carolinensis*

- F M Kinneil from 14 Oct to 31 Dec (GO, AB, RS *et al.*). This bird has been recorded annually since December 2006 and may even be the same bird as recorded on the R Forth near Stirling in 2004. This is the 8th record of this species, thought to involve 2-3 individuals.



Green-winged Teal at Kinneil

Photo by Anne Carrington-Cotton

MALLARD *Anas platyrhynchos* (B,W)

For such an omnipresent species few breeding records have been submitted. Inland WeBS counts: 1514 in Jan, 1794 in Feb, 826 in Mar, 1730 in Sep, 2774 in Oct, 2433 in Nov and 1027 in Dec. Forth Est (WeBS): 296 in Jan, 255 in Feb, 94 in Mar, 160 in Sep, 243 in Oct, 243 in Nov and 140 in Dec.

- F Max: 52 Carronshore 9 Jan; 109 R Forth, S Alloa 17 Jan; 87 Skinflats 10 Oct; 124 Kinneil 21 Nov.
 C Max: 294 Kersiepow, Alva 10 Oct; 70 Gartmorn Dam 6 Dec.
 S Max: 109 Airthrey L, BoA 11 Oct; 80 Callander 15 Oct; 62 Lake of Menteith 20 Oct; 361 Lecropt Carse 23/24 Dec.

NORTHERN PINTAIL *Anas acuta* (W)

Forth Est (WeBS): 57 in Jan, 47 in Feb, 42 in Mar, 0 in Sep, 2 in Oct, 42 in Nov and 15 in Dec, all at Skinflats and Kinneil.

- F Max: 59 Skinflats 2 Mar. 1 Skinflats 3 Jun.
 S One Airthrey L 31 Mar (ACC).

GARGANEY *Anas querquedula*

- F One Kinneil 13 Aug (DT).
 C One Cambus 16 Apr (BDv).

These are the 18th and 19th records of this species in our recording area.

NORTHERN SHOVELER *Anas clypeata* (p)

- F Kinneil: pr 2 and 18 Jan; up to 4 in Feb; 1 on 19 Aug; up to 4 in Sep; 3 on 19 Oct and up to 6 in Nov (DT, AB *et al.*). Skinflats: 3 M on 14 Mar and 3 on 15 Aug (MVB, AB).

COMMON POCHARD *Aythya ferina* (W)

Inland WeBS counts: 1 in Jan, 2 in Feb, 0 in Mar, 0 in Sep, 3 in Oct, 22 in Nov and 1 in Dec.

- F One Skinflats 17 Jan. One Airth 24 Jan (BD). 2 M and 1 F Skinflats 28 Apr (RD). 6 Kinneil 19 Sep (DOE).
 C Gartmorn Dam: 1 on 6 Jan to 5 May, 2 there 9 Mar and 1 Apr; 1 on 21 Sep; 10 on 19 Nov (TGP, PA, ACR). 10 R Forth, Cambus 21 Nov.
 S Seventeen Lake of Menteith 23 Nov (NB).

TUFTED DUCK *Aythya fuligula* (B, W)

Inland WeBS counts: 203 in Jan, 232 in Feb, 237 in Mar, 143 in Sep, 469 in Oct, 279 in Nov and 73 in Dec.

- F Max: 24 Callendar Park, Falkirk 9 Jan; 23 Skinflats 16 May; 21 Little Denny Res 1 Nov; 30 S Alloa 4 Dec. Also 3 Carronshore 9 Jan and 1 Kinneil (on Forth) 16 Jan.
 C Winter/spring max: 42 R Devon, Menstrie-Tullibody 17 Jan; 148 Gartmorn Dam 14 Mar. Summer: 5 prs Blackdevon wetlands 26 Apr; 20 Gartmorn Dam 5 May. Autumn/winter: 257 Gartmorn Dam 24 Oct; 40 R Devon, Alva/Tullibody 18/19 Dec.
 S Winter/spring max: 35 L Ard 25 Jan; 56 Airthrey L, BoA 15 Feb; 21 L Watston 13 Mar. Autumn/winter max: 48 Blairdrummond 3 Nov; 29 Airthrey L, BoA 18 Nov; 32 Lake of Menteith 23 Nov.

GREATER SCAUP *Aythya marina* (s, w)

Forth Est (WeBS): 31 in Jan, 19 in Feb, 21 in Mar, 3 in Sep, 7 in Oct, 16 in Nov and 0 in Dec.

- F Kinneil/Bo'ness: up to 31 in Jan; up to 19 in Feb; up to 21 in Mar; 8 on 5 May; 1 on 21 Jun and 22 Jul; 2 on 31 Jul; up to 4 in Sep; up to 8 in Oct; up to 20 in Nov; 31 on 31 Dec (RS, DT, AB *et al.*). Skinflats: 13 on 12 Apr; 5 on 10 Oct (MVB). 1 Airth 24 Oct (BD).

COMMON EIDER *Somateria mollissima* (w, s)

Forth Est (WeBS): 10 in Jan, 13 in Feb, 17 in Mar, 0 in Sep, 13 in Oct, 0 in Nov and 42 in Dec.

- F Blackness: max of 12 in Jan and Mar; max of 9 on 5 Apr; max of 9 on 11 Sep; 13 on 10 Dec (AMF). Kinneil: up to 7 in Jan; 7 on 13 Feb; 1 on 8 May; max of 30 on 31 Oct; max of 10 on 20 Nov; max of 42 on 19 Dec (DT, CJP, AB). R Carron, Grangemouth: 3 on 17 Jan; 9 on 14 Feb; 8 on 14 Mar (MVB).

*LONG-TAILED DUCK *Clangula hyemalis*

- F One Kinneil 16 Mar. One Kincardine Br 19 Dec (MVB).

S F and first-winter Lake of Menteith 20 Oct and first-winter there 23 Nov (NB).

*BLACK SCOTER (COMMON SCOTER) *Melanitta nigra*

- F One Kinneil 16 Mar and 8 Apr (DT). These are the 17th and 18th records for the recording area since systematic recording began in 1974, though both may be the same bird.

COMMON GOLDENEYE *Bucephala clangula* (W)

Inland WeBS counts: 468 in Jan, 310 in Feb, 137 in Mar, 2 in Sep, 41 in Oct, 290 in Nov and 467 in Dec.

Forth Est (WeBS): 38 in Jan, 75 in Feb, 26 in Mar, 2 in Sep, 0 in Oct, 17 in Nov and 38 in Dec.

- F Max: 25 Skinflats 2 Mar; 13 Kinneil 17 Oct; 36 R Forth, S Alloa 19 Dec.
 C Max: 32 Gartmorn Dam 14 Mar; 189 R Devon, Tullibody 15 Dec and 65 R Devon, Alva 19 Dec.
 S Max: 109 R Forth, Stirling 16/17 Jan; 37 L Lubnaig 20 Feb; 100 Lake of Menteith 23 Nov.

RED-BREASTED MERGANSER *Mergus serrator* (B, W)

Inland WeBS counts: 20 in Jan, 11 in Feb, 6 in Mar, 7 in Sep, 5 in Oct, 1 in Nov and 2 in Dec.

Forth Est (WeBS): 34 in Jan, 36 in Feb, 20 in Mar, 28 in Sep, 42 in Oct, 71 in Nov and 16 in Dec.

- F Max: 23 Skinflats 17 Jan; 37 Kinneil 10 Oct; 31 R Forth, S Alloa 21 Nov.
 C One Blackdevon wetlands Feb/Mar. 2 Gartmorn Dam 23 Feb.
 S Max: 7 R Devon, Tullibody 20 Jan; 15 Callander 9 Aug.

COMMON MERGANSER (GOOSANDER) *Mergus merganser* (B, W)

Inland WeBS counts: 119 in Jan, 110 in Feb, 101 in Mar, 58 in Sep, 88 in Oct, 118 in Nov and 124 in Dec.

Forth Est (WeBS): 0 in Jan; 1 in Feb, 0 in Mar, 0 in Sep, 28 in Oct, 5 in Nov and 4 in Dec.

- F Max: 15 Kinneil 22 Jul and 6 Aug.
 C Max: 14 R Devon, Tillicoultry 20 Oct.
 S Breeding: 12 Y R Forth, Aberfoyle 26 May; 7 Y R Dochart, Innishewan 30 Jun. Max: 51 R Forth, Stirling 19 Dec.

WILLOW PTARMIGAN (RED GROUSE) *Lagopus lagopus* (B, W)

- S Max: 548 Cringate Muir 5 Feb (DB).

ROCK PTARMIGAN *Lagopus mutus* (B, W)

- S Two Stuc a'Chroin 21 Feb (RR). 5 Stob Garbh 8 Mar (JK). 1 Creag Mhor, G Lochay 26 Mar (DOE). 1 Beinn Dubhchriag 18 Sep (PJW). 35 Ben Challum 14 Nov (LH).

BLACK GROUSE *Tetrao tetrix* (B, W)

- S Records from: Carron Valley; Callander; L Katrine (DF, DAC, MVB).

GREY PARTRIDGE *Perdix perdix* (B, W)

- F Two Tod Hill, Larbert 3 Jun (RS). 3 Kersebrock Fm, Stenhousemuir 17 Oct (BD). 14 Airth 18 Nov (SP). Skinflats max: 15 Newton Road 5 Dec; 16 at Stonehouse

- Fm 17 Dec (AB, SP). 6 S Alloa 26 Dec (BD, HD).
- C Two Tullibody 3 Feb (DAC). 8 Craigton, Kennetpans 7 Nov (SP). 2 Blackdevon wetlands 10 Nov (CJH). 2 Arns, Clackmannan 19 Nov (NB).
- S Cowie: 5 Gallamuir 17 Oct; 13 Cowiehall Fm 7 Nov; 9 Castleton 31 Dec (BD). 10 Pleanmill Fm, Plean 17 Oct (BD). 7 Back O'Muir Fm, Bannockburn 31 Oct (BD).
- *COMMON QUAIL *Coturnix coturnix*
- S One calling Flanders Moss 14 Jul (AR).
- COMMON PHEASANT *Phasianus colchicus* (B, W)
Very large numbers released on shooting estates, otherwise widespread but in smaller numbers.
- S Twenty-two Craigarnhall, Dunblane 14 Nov.
- RED-THROATED LOON *Gavia stellata* (b, w)
- F Two Kinneil 13 Feb (DT). 94 circled over Skinflats and 3 off Bo'ness 19 Sep (MVB, DOE, GG). 1 Skinflats 10 Oct (MVB). 3 off Bo'ness 1 Dec (GG).
- *ARCTIC LOON (BLACK-THROATED DIVER) *Gavia arctica*
- S Two at an undisclosed location in the Trossachs 20 Sep (TL).
- *COMMON LOON (GREAT NORTHERN DIVER) *Gavia immer*
- S First-winter at L Achray 17 Dec 2009 to 20 Jan (SH).
- LITTLE GREBE *Tachybaptus ruficollis* (B, w)
Inland WeBS counts: 41 in Jan, 40 in Feb, 17 in Mar, 119 in Sep, 99 in Oct, 55 in Nov and 41 in Dec.
- F Breeding: 1 and 2 Y Little Denny Res 1 Sep. Site max: 7 Black L, Limerigg and 7 Drumbowie Res 1 Sep. 8 R Carron, Larbert 19 Dec.
- C Breeding: 8 ads and 2 Y Kersiepow Ponds, Alva 9 Sep. Otherwise max: 5 R Devon, Alva 14 Nov.
- S Breeding sites: ad and 1 Y Ochlochty Pond, Dunblane 4 Jul; ad and 2 Y Polmaise Lagoons, Fallin 22 Jul; ad and 2 Y Cromlix House pond 6 Sep. Max: 29 Cambusmore 26 Sep; 19 L Dochart/Lubhair 16 Oct; 14 L Ard 19 Oct.
- GREAT CRESTED GREBE *Podiceps cristatus* (b, W)
Inland WeBS counts: 0 in Jan, 0 in Feb, 10 in Mar, 39 in Sep, 32 in Oct, 22 in Nov and 0 in Dec.
Forth Est (WeBS): 5 in Jan, 17 in Feb, 2 in Mar, 3 in Sep, 6 in Oct and 0 in Nov and Dec.
- F Max: 24 Kinneil 13 Feb.
- C Max: 5 prs Gartmorn Dam 3 Mar.
- S Max: 26 and 9 imms Lake of Menteith 20 Sep.
- *BLACK-NECKED GREBE *Podiceps nigricollis*
- F One R Carron, Larbert 19 Sep (AE).
- This is the first record since 1974 and probably only the second for the recording area following one in 1972.
- *NORTHERN FULMAR *Fulmaris glacialis*
- F One off Bo'ness 7 Sep (GG).
- NORTHERN GANNET *Morus bassanus* (p)
- F One Kinneil 9 May (GG). Bo'ness: 9 on 7 Sep and 44 on 19th (GG). Skinflats, Sep: imm on 7th; 2 on 8th; 3 imms on 13th; imm on 19th; 20 on 20th (NC, SP, MVB, AB). Kinneil: 31 on 18 Sep; 1 on 9 Oct (DT). Imm Airth mudflats 21 Sep (SP).
- S Two imms < W Fallin 24 Sep (MVB).
- GREAT CORMORANT *Phalacrocorax carbo* (S, W)
Counts from roost at S Alloa/Longcarse needed.
Inland WeBS counts: 46 in Jan, 45 in Feb, 19 in Mar, 57 in Sep, 79 in Oct, 64 in Nov and 38 in Dec.
Forth Est (WeBS): 26 in Jan, 60 in Feb, 30 in Mar, 96 in Sep, 62 in Oct, 67 in Nov

and 23 in Dec.

F Max: 28 Skinflats 19 Sep.

C Max: 41 R Forth, Cambus 20 Sep.

S Max: 20 Lake of Menteith 20 Oct and 23 Nov; 16 R Forth, Stirling 11 Oct; 14 Ashfield 13 Dec.

*BITTERN *Botaurus stellaris*

F One Skinflats 17 Feb to 10 Mar (TG, RS).

This is only the 2nd record of this species since modern recording began in 1974, the first having also been recorded at Skinflats in 1997.

*LITTLE EGRET *Egretta garzetta*

F One ranging between Kincardine Br, Skinflats tidal exchange, Skinflats and Kinneil from 20 Jul to 23 Nov; with 2 Kinneil 30 Sep to 17 Oct (NC, RS, ACC *et al.*).

C One Cambus 11 Oct (AM). 1 Gartmorn Dam 12 Oct.

The above records in the Grangemouth area and Cambus/Gartmorn probably all relate to the same bird, as the dates for the different locations are exclusive of each other. These and the two birds at Kinneil therefore become the 9th and 10th records, respectively, for the recording area.

GREY HERON *Ardea cinerea* (B,W)

Inland WeBS counts: 59 in Jan, 60 in Feb, 35 in Mar, 92 in Sep, 101 in Oct, 75 in Nov and 46 in Dec.

Forth Est (WeBS): 19 in Jan, 13 in Feb, 12 in Mar, 44 in Sep, 73 in Oct, 36 in Nov and 22 in Dec.

F Breeding: 8 AON Dunmore Woods 24 Apr (AB); 1 nest with 2 Y Kinneil Woods. Max: 33 S Alloa 7 Oct.

C Max: 12 R Devon, Dollar-Tillicoultry 24 Sep and 15 Dec; 8 Gartmorn Dam 1 Apr.

S Max: 14 Lecropt Carse 24 Dec.

RED KITE *Milvus milvus* (b ,W)

S Breeding: of 25 prs 21 laid eggs, 15 prs successfully fledging 28 Y (DOE). Argaty, BoD max: 49 on 26 Nov (MMcD). Away from BoD: 1 Lochearnhead Jan/Feb; 1 Stirling Jan/Feb; 1 G Ogle 8 Feb; 1 Kippen 23 Feb; 1 Dunblane 2 Mar.

*WHITE-TAILED EAGLE *Haliaeetus albicilla*

At least two imms from the Fife reintroduction scheme were seen in the recording area in 2010.

F One Fife reintroduction scheme imm bird ('yellow Z') Skinflats area 9 Sep to 10 Oct (NC, AB, DOE *et al.*).

C One Fife reintroduction scheme imm bird ('yellow C') King's Seat, Ochils 31 Oct (KB).

S One Argaty, BoD 25 Mar (MMcD). 1 Aberfoyle 1 Oct (DOE).

There have been 15 records of this species, both wild and reintroduced, since 1974, the first one having occurred in 1999. Deciding which records refer to the same bird(s) is sometimes difficult. It is estimated that potentially 10 different individuals have been involved.

NORTHERN HARRIER (HEN HARRIER) *Circus cyaneus* (b, w)

S One Carron Valley Res 2 May (RG). 1 L Katrine 4 Sep (MVB). 1 ringtail Flanders Moss 17 and 19 Sep (DOE, JB). 1 M Plean CP 18 Sep (DOE). 1 ringtail L Mahaick, BoD 3 Nov (NB).

*NORTHERN GOSHAWK *Accipiter gentilis*

S One flew over Dunblane 13 Mar (CS).

EURASIAN SPARROWHAWK *Accipiter nisus* (B, W)

Recorded throughout the majority of the recording area. Contributors are encouraged to submit breeding records.

COMMON BUZZARD *Buteo buteo* (B,W)

Inland WeBS counts: 44 in Jan, 53 in Feb, 33 in Mar, 25 in Sep, 47 in Oct, 46 in Nov and 34 in Dec.

Recorded throughout much of the recording area. Contributors are encouraged to submit breeding records.

GOLDEN EAGLE *Aquila chrysaetos* (b, w)

S One Ben Oss 24 Apr (GG). 1 G Balquhiddier 4 May (FAM). 1 BoD 23 Jul (DOE). 2nd winter imm BoD 10 Oct (AB).

OSPREY *Pandion haliaetus* (B)

F One Stenhousemuir 3 May.

C Gartmorn Dam: 1 on 1 Apr, 2 on 31 Aug and 1 on 16 Sep.

S First records: 1 Doune 27 Mar; 1 Drumloist 29 Mar; 1 L Rusky 1 Apr. Other records from BoA, Stirling, L Coulter, Flanders Moss, Carron Valley Res (max of 2), L Ard; Lake of Menteith (max of 5 on 7 May) and G Dochart.

COMMON KESTREL *Falco tinnunculus* (B,W)

Recorded throughout most of the recording area. Contributors are encouraged to submit breeding records.

MERLIN *Falco columbarius* (b?, w)

F One Dunmore 4 Jan (BD, HD). 1 BoD 5 Apr (DOE). F/imm Skinflats 29 Oct (AB). 1 Blackness 5 Nov (SP). 1 Skinflats 15 Nov (SP).

S Breeding: G Finglas Res area (DOE). One Lecropt Carse 21 Mar (DT). M Flanders Moss 16 Apr (JTMT). 1 Thornhill Carse 13 Oct (CJH). 1 Drip Moss 6 Nov (NB). 1 Fallin 22 Nov (BD).

PEREGRINE FALCON *Falco peregrinus* (B, W)

F One Kinneil and Dunmore 2-16 Jan. 1 Kinneil/Skinflats/Airth/S Alloa 1 Aug to 5 Dec. 1 Tod Hill, Larbert 1 Oct.

C One Tillicoultry 6 Jan. 1 Castlebridge Business Park, Forestmill 27 Jan. 2 Alva G 22 Aug. 1 Blackgrange 25 Sep. 1 Cambus 12 Oct.

S One Dunblane cathedral Jan, 1 Stirling/BoA/Dunblane Jan-Mar. 1 Fallin 25 Sep. 1 Carron Valley 11 Oct. 1 Ashfield 20 Dec.

WATER RAIL *Rallus aquaticus* (b, w)

F One to two Kinneil 28 Feb to 20 Apr (DT, AB) and 8 Aug to 20 Nov (DT). 2 Carronshore 13 Nov (AB). 1 Skinflats 5 Dec (AB, ACC).

C One Craigrie pond, Clackmannan 21 Feb (RGo). 2 Cambus 8 Mar (MVB). 1 Blackdevon wetlands 26 Oct (SP). 1 R Devon, Tillicoultry 10 Dec (NB).

S One Crianlarich 11 Jan (IMcP). 1 L Watston 17 Oct (DOE).

COMMON MOORHEN *Gallinula chloropus* (B,W)

Inland WeBS counts: 66 in Jan, 68 in Feb, 42 in Mar, 93 in Sep, 88 in Oct, 100 in Nov and 51 in Dec.

F Breeding: 3 Y Kinneil 17 Jul. Max: 10 Callendar Park, Falkirk 23 Feb; 12 R Carron, Stenhousemuir 18 Dec.

C Breeding: 4 ads and 2 Y Cambus 9 Sep. Max: 6 Cambus 24 Sep; 8 R Devon, Alva 19 Dec.

S Breeding: 1 ON Auchlenlaich Farm, Callander 4 May. Max: 10 R Teith, Callander 19 Jan; 12 Culthenhove Dam 21 Feb; 14 Airthrey L, BoA 16 Nov.

COMMON COOT *Fulica atra* (B, W)

Inland WeBS counts: 205 in Jan, 176 in Feb, 105 in Mar, 56 in Sep, 89 in Oct, 130 in Nov and 57 in Dec.

F Max count: 25 Callendar Park, Falkirk 29 Dec. Also 1 Skinflats 20 Aug.

C Winter/spring max: 107 Gartmorn Dam 24 Jan. Autumn/winter max: 20 Gartmorn Dam 27 Nov.

S Breeding: 2 prs fledging 5 Y Ochlochty Pond, Dunblane Jun. Site max: 65

Airthrey L, BoA 19 Jan; 38 Lake of Menteith 23 Nov.

*COMMON CRANE *Grus grus*

- S One > S at Craiggannet Hill, Carron Valley Res 10 Jun (JJS). Accepted by the Upper Forth and Clyde Rarities Committees. This is the 2nd record for the recording area following the first one in 2003.

EURASIAN OYSTERCATCHER *Haematopus ostralegus* (B, W)

WeBS Forth estuary peaks were 461 in Feb and 401 in Dec.

- F Kinneil: 155 on 15 Jan increased to 165 on 2 Mar, with at least 120 there 22 Jul, 230 on 6 Aug, 200 on 17 Oct and 265 on 21 Oct. Skinflats tidal exchange: 15 on 27 May, with 19 on 19 Jul, 28 on 26 Jul, 35 on 2 Aug, 36 on 7 Sep and a WeBS peak of 75 at Skinflats on 19 Sep. Blackness: 16 on 24 Apr with 43 there 1 Sep, 61 on 7 Sep, 78 on 20 Sep, 166 on 4 Oct and 208 on 5 Nov.
- C Return inland: 9 River Devon, Alva 21 Feb.
- S Return inland: heard overhead Stirling 18 Jan; 1 R Forth, Allan Water-Stirling Br conf 31 Jan; 2 Airthrey & 1 Keir roundabout, BoA 6 Feb; 27 Craigforth, Stirling 6 Feb and 31 there 20 Feb; 20 Airthrey, BoA 7 Feb; 5 Ashfield 17 Feb with 16 there (Craigton Fm) 20 Feb and 47 on 13 Mar. 61 Carse of Lecropt 5 Mar; 21 Cocksburn Res 10 Mar; 5 L Watston 13 Mar; 81 R Teith, W Row-Forth conf 13 Mar; 2 Keltie Water by Gart GP and 6⁺ L of Menteith 14 Mar. Pr Dunblane golf course 19 May hatched 3 chicks, thought to have been killed 2 days later.

*LITTLE RINGED PLOVER *Charadrius dubius*

- F One Skinflats Lagoons 25 Jul (BRG).
- S One pair bred unsuccessfully at an undisclosed location in June (DMB).

These are the 16th and 17th records, respectively, for the area since modern recording began in 1974.

COMMON RINGED PLOVER *Charadrius hiaticula* (b, W)

WeBS estuary peaks were 9 in Mar and 26 in Oct.

- F Smaller numbers at Kinneil than in 2009: 2 on 17 Jan, 3 on 20 Apr, 5 on 5 May, 4 there at Avonmouth 19 Jul, 1 on 14 Aug and 5 Sep. Larger numbers now at Skinflats tidal exchange: 44 on 27 May, 95 on 1 Jun, 55 on 2 Jun, 23 on 7 Jul. Skinflats: 9 at Carron mouth 14 Mar, 29 on 6 Aug and 7 on 28 Aug. Blackness: 13 on 27 Jan, 10 on 5 Mar, 47 on 27 May, 17 on 11 Sep, 32 on 16 Oct, 11 on 5 Nov and 8 on 10 Dec.
- C Two Kennetpans 19 Sep.
- S Two Carron Valley Res 29 Jun.

EUROPEAN GOLDEN PLOVER *Pluvialis apricaria* (B, W)

WeBS estuary peaks were 0 in the first winter period and 305 in Oct. Generally a poor autumn with reduced numbers.

- F Skinflats tidal exchange: 3 on 2 Mar, 4 there 19 Sep, 1 on 7 Oct rose to 10 on 10 Oct and 6 on 2 Nov. Skinflats: 12 on 28 Aug, 31 on 19 Sep, 85 on 10 Nov and 85 on 10 Oct. Kinneil: ca. 100 on 20 Apr, 30 on 24 Sep, 68 on 25 Sep, ca. 200 on 3 Oct, 500 on 17 Oct, ca. 100 on 12 Nov and ca. 400 on 20 Nov. Blackness: 25 on 7 Aug, 31 on 11 Sep, 134 on 16 Oct and 4 on 17 Dec. Elsewhere 9 Kersebrock Fm, Stenhousemuir 17 Oct.
- S Eight Carse of Lecropt 16 Apr with 1 there 28 Apr. 8 L Tay, Ardeonaig 17 May. 4 Rosehill, Plean 17 Oct.

GREY PLOVER *Pluvialis squatarola* (W)

WeBS estuary peaks were 2 in Jan and 18 in Oct. Generally a better year than 2009.

- F Two Kincardine Br 17 Jan and 2 Blackness 27 Jan were the only counts during the first winter season. Skinflats: 1 on 28 Aug; at tidal exchange there: 2 on 20 Sep, 1 on 10 Oct and 2 on 2 Nov. Blackness: 7 on 19 Oct and 6 on 5 Nov.

Kincardine Br: 18 on 10 Oct and 2 on 19 Dec. Elsewhere: 8 Airth 8 Oct and 12 Kinneil 20 Nov.

NORTHERN LAPWING *Vanellus vanellus* (B, W)

WeBS estuary peaks were 109 in Feb and 774 in Oct. Again comparatively low numbers, as noted since 2007.

- F Blackness: 38 on 20 Jul, 27 on 20 Sep, 17 on 28 Oct, 28 on 24 Nov and 6 on 17 Dec. Skinflats: 70 on 3 Jul, 380 on 6 Aug, 265 on 20 Aug, 311 on 19 Sep, 179 at tidal exchange 7 Oct and 151 on 10 Oct. Kinneil: 100 on 22 Aug, 500 on lagoon 25 Aug, 300 on 5 Sep, 389 on 9 Sep, ca. 450 on 25 Sep, ca. 350 on 9 Oct and 12 Nov.
- C No data received for Tullibody Inch where large numbers recorded previously. 50 R Devon, Alva 21 Feb. 250 R Forth, Fallin-Cambus 27 Feb with 190 there 20 Nov. 250 Cambus Pools with 300 there 20 Nov.
- S At least 7 prs displaying Carse of Lecropt 20 Mar with 4 AoT (1 chick) there N of Westleys 2 May. 27 L Watston 13 Mar. 3 prs Drumloist, BoD 3 Apr.

RED KNOT *Calidris canutus* (W)

WeBS estuary peaks were 1814 in Feb and 293 in Nov, the latter much lower than in 2009.

- F Good counts from Kinneil but none at Skinflats: 2550 on 15 Jan, ca. 400 on 17 Jan, 300 on 7 Feb, ca. 2000 on 28 Feb and 1350 on 2 Mar. Elsewhere 1 Airth 17 Jan, 66 Blackness 20 Mar. Late return of small numbers again. Kinneil: 2 on 8 Aug, 10 on 22 Aug, 20 on 5 Sep, 90+ on 18 Sep, ca. 100 on 9 Oct, 50 on 17 Oct, 5 on 10 Oct and ca. 600 on 20 Nov. Blackness: 22 on 23 Oct, 6 on 5 Oct and 2 on 17 Dec.

SANDERLING *Calidris alba*

None were recorded during the WeBS estuary counts.

- F One Kinneil 8 Sep (DMB).

*LITTLE STINT *Calidris minuta*

- F Ad Skinflats lagoons 24 and 25 Jul (AB, BRG). Single Kinneil 8 and 9 Sep (DMB, NB).

CURLEW SANDPIPER *Calidris ferruginea* (p)

During the WeBS estuary counts 10 were recorded in Sep and 1 in Oct

- F Kinneil: 8 on 8 Sep with singles there 11, 18, 25, 26 Sep and 9 Oct (DMB, BRG, GG, DT). Excellent numbers at Skinflats lagoons: 19 on 11 Sep, 22 on 13 Sep and 1 on 22 Sep (BRG, MVB).

Autumn passage, area summary (minimum number/half month)			
Jul	Aug	Sep	Oct
0	0	30	1
0	0	2	0

*PURPLE SANDPIPER *Calidris maritima* (w)

- F One Kinneil 5 Nov (CF).

DUNLIN *Calidris alpina* (b?, W)

WeBS estuary peaks were 2389 in Jan and 6112 in Nov, the latter much higher than in 2009.

- F Kinneil: much higher numbers with 3000 on 15 Jan, 1500 on 17 Jan, 200 on 7 Feb, 1430 on 2 Mar. Autumn return: 20+ on 17 Jul, 95+ on 22 Jul, 35 on 22 Aug, then ca. 1200 on 9 Oct, 1200+ on 17 Oct, 1940 on 21 Oct, ca. 1200 on 20 Nov and 400 on 12 Dec. Skinflats: 1264 on 14 Feb. Autumn return: 90 on 15 Jul, then a good WeBS count of 4770 on 21 Nov and 1723 on 19 Dec. Smaller numbers at Skinflats tidal exchange: 13 on 27 May, 20 on 2 Jun, 20 on 9 Jul, 5 on 7 Sep and 60 on 8 Oct. Blackness: 8 on 20 Mar, 9 on 27 May, 28 on 7 Aug, 31 on 20 Sep, 87 on 19 Oct, 174 on 20 Nov and 76 on 17 Dec.
- S Two Carron Valley Res 21 Sep. 5 Carse of Lecropt, NW of Westleys 29 Sep.

RUFF *Philomachus pugnax* (w, p)

WeBS estuary peaks were 1 in Feb and 1 in Sep.

- F An adult overwintered at Skinflats where it was seen on 17 Jan and 14 Feb (AB, MVB). Autumn passage started there with singles on 24 Jun, 20 Aug (juv), 28 Aug, 5 Sep with a single at the tidal exchange on 8 Sep (BRG, AB, GG, DOE, NC). Kinneil: 6 on 8 Aug, 4 on 19 Aug, 3 on 21 and 22 Aug, 2 on 24-26 Aug, 1 on 29 Aug and 3 on 9 Sep (DT, BRG, AB, RS, NB). 2 juvs. Kersie Mains Fm, S Alloa 24 Oct (BD).

Autumn passage, area summary (minimum number/half month)							
Jul		Aug		Sep		Oct	
0	0	6	5	4	0	0	2

JACK SNIFE *Limnocyptes minimus* (w)

- F Singles Kinneil 5 Jan, 17 Oct and Kinneil Wood pond 10 Dec (RS, DT).
 C As in 2009, single on R Devon, Tillicultry-Alva stretch 19 Mar and 10 Oct (GEL)
 S R Forth: singles Br of Frew 1 Apr and Teith-Allan conf 10 Oct. Single Carse of Lecropt, Longleys 10 Oct and 2 L Rusky 20 Oct (NB, DT).

COMMON SNIFE *Gallinago gallinago* (B,W)

The WeBS estuary peak during the first winter season was 3 in Mar with none during the second winter period.

- F Five Kinneil 5 Jan. 1 at Skinflats tidal exchange 29 Nov. 11 St. Helen's Loch, Bonnybridge 1 Nov.
 C Six Craigrie Pond, Clackmannan 21 Feb.
 S R Forth: 11 Stirling Br-Upper Taylorton 17 Jan and 23 there 11 Oct; 5 Teith-Allan Water conf stretch 20 Feb; 8 Stirling Br-A91 20 Feb, 9 there 14 Mar and 22 on 15 Nov. 41 Netherton Marsh, Carse of Lecropt 20 Feb with 58 there 14 Nov. 1 chipping Sheriffmuir 6 May. 6 Polmaise Lagoons 16 Sep. 10 Cambusmore/Gart GP 24 Oct. 26 L Coulter 1 Nov. 40 R Teith, W Row-Forth conf 19 Dec.

EURASIAN WOODCOCK *Scolopax rusticola* (B, W)

Grossly under-recorded during the breeding season.

- F One Pineapple Wood, Airth 4 Jan. 8 Kinneil 5 Jan. 1 past Carron House, Carronshore 9 Jan. Skinflats: 1 at lagoons 15 Nov and 3 there 5 Dec with 1 at tidal exchange 30 Nov.
 C Single Gartmorn Dam 6 Jan with 3 there 6 Dec. R Devon: singles Alva-Tullibody Br 14 Nov and B934-Crook of Devon 30 Dec.
 S One Doune 1 Jan and 1 at Sauchans there 13 Mar. Singles Laighills, Dunblane 1 Jan and Firbush, L Tay 6 Jan. BoA: 2 Airthrey 8 Jan with 1 there 2 Dec and 3 Mine Wood 26 Dec. 2 L Watston 13 Mar. Singles Westleys, Carse of Lecropt and R Forth, Teith-Allan conf 14 Nov; Ewich, Strath Fillan 15 Nov; Monument Wood Sheriffmuir 20 Nov; flying in daylight low over Broomridge housing estate, Stirling 8 Dec; Craigforth, Stirling 12 Dec and Ballockneck Burn, Buchlyvie 17 Dec.

BLACK-TAILED GODWIT *Limosa limosa* (W)

WeBS estuary peaks were 141 in Jan and Mar and 359 in Sep.

Several birds at Kinneil carry colour rings, with birds ringed in France and Iceland using this site as a stop-over. Please scrutinize flocks carefully and submit details to the BTO and the recorder.

- F Recorded all year in the Grangemouth area. Monthly peaks at Kinneil: 114 on 15 Jan, 86 on 9 Feb, 137 including a colour-ringed bird on 20 Apr, 48 on 5 May, 10 on 3 Jun, 214 on 22 Jul, 300 on 25 Aug, ca. 300 on 25 Sep, 280 on 21 Oct, 76 on 7 Nov and 32 on 17 Dec. Much smaller numbers again at Skinflats with monthly peaks of singles on 24 Jan and 14 Feb, 3 on 15 Mar, 93 on 26 Apr, 32 mostly *islandica* birds on 4 May, 42 on 5 May, 29 on 21 Jul, 8 on 20 Aug, 20 on 23 Oct and 5 on tidal

exchange 2 Nov. Elsewhere 8 Airth foreshore 17 Jan with 10 there 14 Mar.

C Twenty-eight Blackdevon wetlands 7 May.

BAR-TAILED GODWIT *Limosa lapponica* (W)

WeBS estuary peaks were 162 in Feb and 291 in Nov.

F Kinneil: 218 on 15 Jan, 150 on 7 Feb, 10 on 13 Aug, 2 on 20 Sep, 33 on 17 Oct and 100 on 21 Nov. Blackness: 35 on 11 Sep, 41 on 19 Oct, 12 on 20 Nov and 2 on 10 Dec. 20 Airth foreshore 12 Mar. 60 Bo'ness 11 Nov.

C Six Kennetpans 21 Nov.

WHIMBREL *Numenius phaeopus* (p)

None recorded during the WeBS estuary counts. A poor year for this species.

F Skinflats: 3 at lagoons 21 Apr with singles at tidal exchange 21 Jul and 1 Aug and 2 there 8 Sep (BRG, RS, NC). Kinneil: 2 on 5 May, 1 on 22 Jul (DT).

Autumn passage, area summary (minimum number/half month)							
Jul		Aug		Sep		Oct	
0	2	1	0	2	0	0	0

EURASIAN CURLEW *Numenius arquata* (B, W)

WeBS estuary peaks were 585 in Feb and 1004 in Oct.

F Skinflats tidal exchange unless otherwise marked: 377 on 17 Jan (WeBS), 88 on 21 Jan, 156 on 29 Mar, 83 on 15 Jul, 380 on 10 Oct (WeBS), 125 on 7 Oct, 153 on 10 Oct, 136 on 2 Nov and 170 on 23 Nov. Kinneil: 390 on 6 Aug, ca. 450 on 13 Aug, 536 on 9 Sep, ca. 270 on 9 Oct and 30 on 12 Dec. 95 Dunmore 2 Mar. 254 Airth 4 Nov.

C Cambus Pools: 42 on 10 Jan, 133 on 2 Mar, 20 on 24 Sep, 74 on 19 Oct and 150 on 20 Nov. 112 Kennetpans 14 Mar. 137 R Forth, Fallin-Cambus 20 Nov.

S Carse of Lecroft: 110 on 7 Mar, ca. 60 on 21 Mar, 2 there N of Westleys 2 May. 94 Craigton Fm, Ashfield 15 Mar. 130 R Teith, W Row-Forth conf 13 Mar. 51 Cambuskenneth 12 Apr.

COMMON SANDPIPER *Tringa hypoleucos* (B)

F Skinflats lagoons: singles on 21 Apr and 4 May, 1 on 23 Jun, 4 on 15 Jul, 6 on 18 Jul and 2 on 3 Aug. At Tidal exchange there: singles 19-21 Jul, 2 on 1 Aug and 3 on 2 Aug. Kinneil: 3 on 30 Jun, 5 on 22 Jul, 5 on 1 Aug (Avon mouth), 6 on 6 Aug and 2 on 22 Aug. 2 Blackness 7 Sep.

C One Gartmorn 22 Apr.

S One Fallin 13 Apr. 3 Carron Valley Res 2 May. 1 G Balquhidder 4 May. 2 Cononish, Tyndrum 5 May. 1 Kilbryde, BoD 19 Jun. 1 Airthrey 15 Jul. 5 L Venachar 23 Jul. 2 Blairdrummond 25 Jul. 2 Ardchyle, G Dochart 1 Aug.

Autumn passage, area summary (minimum number/half month)							
Jul		Aug		Sep		Oct	
5	18	7	2	1	0	0	0

*SPOTTED REDSHANK *Tringa erythropus* (p)

F Kinneil: 1-2 recorded between 19 Aug and 24 Sep (DT, GO, BRG, AB, CJP, CJH, DT, PT, RS, DMB, NB, DOE).

C One Blackdevon wetlands 2 May (DMB).

COMMON GREENSHANK *Tringa nebularia* (w, p)

WeBS estuary peaks were 11 in Mar and 6 in Sep.

F Present at Skinflats all year, except May, June and December. Monthly maxima: 3 on 17 Jan (WeBS); 3 on 14 (WeBS) and 20 Feb; 3 on 13, 14 (WeBS) and 28 Mar; 1 on 10 and 24 Apr (MVB, DAC, AB, RS). Autumn passage monthly maxima: 3 on 21 Jul and at tidal exchange there 26 Jul; 1 on 15 Aug; 4 at tidal exchange 2 Sep and lagoons 5 Sep (RS, NC, AB, NC, DOE). Winter maxima: 3 at tidal

exchange 10 Oct; 2 at lagoons 15 Nov (NC, SP). Kinneil monthly maxima: 1 on 4 Jan, 2 on 26 Apr (RS). Autumn passage maxima: 1 on 8, 17, 22 and 31 Jul; 7 on 8 and 26 Aug; 9 on 24 Sep (DT, RS, GG). Winter monthly maxima: 3 on 3 and 9 Oct; 1 on 7, 11, 12, 20, 21 and 24 Oct (DT, RS, SP, AB, MMCG). Elsewhere 1 Blackness 20 Sep and 3 Airth 3 Oct (AMF, SP).

S One L Dochart 20 May (NB).

Autumn passage, area summary (minimum number/half month)							
Jul		Aug		Sep		Oct	
3	4	8	7	9	13	9	2

COMMON REDSHANK *Tringa totanus* (B, W)

WeBS estuary peaks were 2417 in Feb and 2656 in Oct.

F Skinflats estuary (WeBS): 964 on 17 Jan, 1073 on 14 Feb, 1037 on 14 Mar, 400 on 15 Jul, 1116 on 19 Sep, 951 on 10 Oct with 32 at tidal exchange on 8 Oct, 1215 on 21 Nov and 570 on 19 Dec. Kinneil: ca. 400 on 22 Jul, 1170 on 6 Aug, 350+ on 8 Aug, 400 on 4 Sep, 677 on 9 Sep, ca. 400 on 9 Oct and 200 on 12 Dec. Blackness: 54 on 20 Mar, 127 on 11 Sep and 82 on 20 Nov. 30 Bo'ness town centre and foreshore 13 Mar.

C Four Cambus Pools 14 Mar. 2 Alva Floods and R Devon, Tillicoultry-Alva, both 19 Mar. 2 prs Blackdevon wetlands 14 Jun. 3 R Forth, Fallin-Cambus 20 Nov.

S Carse of Lecropt: 24 on 21 Mar. 1-4 along various sections of the R Forth in Jan, Feb, Mar and Nov. In breeding season: 2 Killin Marshes 10 May.

RUDDY TURNSTONE *Arenaria interpres* (W)

Occurred in high numbers this year. None recorded during the first winter season but a WeBS estuary peak of 11 in Sep.

F Kinneil: 1 on 2 Jan, 2 on 11 Jan, 14 on 22 Jul, 1 on 8 Aug and 17 Dec (RS, DT, GG). Blackness: 6 on 14 Mar, 1 on 7 Sep, 2 on 16 Oct, 5 on 5 Nov and 2 on 17 Dec (AMF). Bo'ness: 4 on 15 Jan and 19 on 28 Feb (MVB, DT). 6 Carron mouth, Grangemouth; 19 Sep (MVB).

*GREY PHALAROPE *Phalaropus fulicarius*

F One Skinflats 19 to 20 Sep (RAB, GO, CJP, DOE, RS, AB). This is the 2nd record for the area since modern recording began in 1974, following a bird at Tullibody Inch on 15 Sep 1991.



Grey Phalarope at Skinflats

Photo by John Nadin

- *PARASITIC JAEGER (ARCTIC SKUA) *Stercorarius parasiticus* (p)
 F Off Bo'ness: singles on 2, 3 and 5 Sep and 12 on 7 Sep (GG). Singles Kinneil 3 and 10 Oct (DT, JRC).
- *GREAT SKUA *Stercorarius skua*
 F One > Kinneil 26 Sep.
- *BLACK-LEGGED KITTIWAKE *Rissa tridactyla* (P, w)
 F Three Kinneil 8 Jul (DT). 21 off Bo'ness 7 Sep (GG). 4 Kinneil 9 Oct (DT).
 Correction: the records in 2009 for Skinflats and Doune were erroneous.
- COMMON BLACK-HEADED GULL *Larus ridibundus* (B,W)
 Inland WeBS counts: 734 in Jan, 999 in Feb, 392 in Mar, 555 in Sep, 762 in Oct, 873 in Nov and 607 in Dec.
 Forth Est (WeBS): 404 in Jan, 121 in Feb, 111 in Mar, 435 in Sep, 839 in Oct, 254 in Nov and 669 in Dec.
 F Max: 780 R Forth, S Alloa 7 Oct; 549 Kinneil 19 Dec.
 C Max: 300 Alva 21 Feb; 100 Gartmorn Dam 19 Nov; 320 Alloa 26 Nov.
 S Max: 160 L Watson 13 Mar.
- *LITTLE GULL *Larus minutus*
 F First-winter Skinflats 20-27 June and 9 July (RS, AB *et al.*).
- *MEDITERRANEAN GULL *Larus melanocephalus*
 F Ad winter Airth 17 Jan; same bird (green colour ring on left leg) S Kersie, S Alloa 17 Oct (BD, HD). Different bird R Forth, S Alloa 23 Jan and Kersebrock Fm, Stenhousemuir 30 Jan (BD, HD). Ad Blackness 8 Oct (EMcG).
- MEW GULL (COMMON GULL) *Larus canus* (B,W)
 Inland WeBS counts: 179 in Jan, 336 in Feb, 169 in Mar, 25 in Sep, 220 in Oct, 1046 in Nov and 112 in Dec.
 Forth Est (WeBS): 172 in Jan, 73 in Feb, 111 in Mar, 94 in Sep, 46 in Oct, 52 in Nov and 259 in Dec.
 F Max: 150 Kinneil 17 Jan and 190 there 19 Dec.
 C Max: 30 Gartmorn Dam 19 Nov.
 S Breeding: pr ON Auchenlaich, Callander 4 May; 21 nests L Tay 21 Jun. Max count: 150 L Watston 13 Mar.
- *RING-BILLED GULL *Larus delawarensis*
 F Ad at Kinneil from 2009 to 18 Jan and from 19 Aug to 16 Oct (DT, DMB, GO); returning bird since 2007. This is the 8th record of this species, involving 4 different birds.
- LESSER BLACK-BACKED GULL *Larus fuscus* (b, S)
 Inland WeBS counts: 0 in Jan, 7 in Feb, 45 in Mar, 50 in Sep, 162 in Oct, 158 in Nov and 2 in Dec.
 Forth Est (WeBS): 0 in Jan, 1 in Feb, 33 in Mar, 32 in Sep, 24 in Oct, 7 in Nov and 0 in Dec.
 F Max: 22 Skinflats 26 Feb; 25 R Forth, S Alloa 14 Mar; 43 Little Denny Res 2 Oct; 64 Carronshore 14 Nov.
 C Max: 80 Cambus 15 Aug.
 S Max: 320 Thornhill Carse 11 Sep.
- HERRING GULL *Larus argentatus* (b, W)
 Inland WeBS counts: 43 in Jan, 319 in Feb, 46 in Mar, 23 in Sep, 25 in Oct, 36 in Nov and 16 in Dec.
 Forth Est (WeBS): 467 in Jan, 406 in Feb, 412 in Mar, 263 in Sep, 331 in Oct, 534 in Nov and 188 in Dec.
 F Max: 465 Kinneil 17 Jan; 520 Kinneil 21 Nov.
- *GLAUCOUS GULL *Larus hyperboreus*
 F One Kinneil 17 Jan (JRC). This is possibly the same bird as seen there in late

December 2009. As such it is the 19th record of this species, thought to involve 17 individuals.

GREAT BLACK-BACKED GULL *Larus marinus* (S,W)

Inland WeBS counts: 6 in Jan, 7 in Feb, 7 in Mar, 5 in Sep, 8 in Oct, 5 in Nov and 2 in Dec.

Forth Est (WeBS): 42 in Jan, 9 in Feb, 2 in Mar, 8 in Sep, 5 in Oct, 42 in Nov and 21 in Dec.

F Max: 42 Kinneil 17 Jan and 41 on 21 Nov.

C Six Blackgrange 10 Oct. 1 Cambus 20 Nov.

S One Carron Valley Res 2 May. 1 Lake of Menteith 20 Oct.

SANDWICH TERN *Sterna sandvoicensis* (P)

F WeBS count of 270 on 19 Sep included 135 at Skinflats, 29 at Kinneil and 81 at Bo'ness.

COMMON TERN *Sterna hirundo* (B)

F First on 4 May at Skinflats. Max: 68 (16 juvs) Kinneil and 45 Grangemouth both 6 Aug (MVB).

*GUILLEMOT *Uria aalge*

F One off Bo'ness 7 Sep (GG).

S One Cambusmore 26 Sep (NB).

*RAZORBILL *Alca torda*

F One off Bo'ness 7 Sep (GG). 2 off Kinneil 10 Oct (JRC).

*LITTLE AUK *Alle alle*

F One off Bo'ness 1 Dec (GG). This is the 8th record of this species since 1974.

COMMON PIGEON (FERAL PIGEON) *Columba livia* (B,W)

F Small numbers recorded in Blackness; Haircraigs, Bonnybridge and Kinneil.

C Small numbers recorded in Blackgrange.

S One hundred and seventeen Waterside, Kinbuck 30 Jan. Small numbers also recorded in Stirling and Dunblane.

STOCK DOVE *Columba oenas* (B, W)

F One Kinneil on 3 Jan: in Jan and ca. 30 on 28 Feb. 3 Skinflats 3 Jul with 140 there at Brakenlees 24 Nov. 2 Powfoulis 22 Sep.

C Woodland Park and Drove Road, Alva: 2 on 18 Mar and 1 there 27 Jun. Also recorded Gartmorn Dam 29 May.

S Holmehill, Dunblane: up to 3 on several dates in Feb, April to Aug, Nov and Dec. Prs Biggins Fm, Dunblane 2 May and Deanston 25 Jul. Also present Airthrey, BoA Feb and Blairlogie Apr.

COMMON WOOD PIGEON *Columba palumbus* (B, W)

BBS¹: recorded at 4.6 b/lkm

C Hillend, Clackmannan: 475 on 6 Feb. In breeding season: 41 Gartmorn 30 Apr and 50 R Devon, Alva 2 May.

S Dunblane: 580 Stonehill 19 Jan, ad feeding Y Ochiltree 19 Mar, 990 Kippenross Cottages 25 Dec. Pr with Y Keir Street, BoA 2 Jul.

¹ Due to the small and varying number of squares, turn-over of surveyors and different percentages of habitats covered each year, inter-annual comparisons are unlikely to be valid. Breakdown into habitat categories is not valid due to the unrepresentativeness of the squares surveyed and the varying percentage of each habitat category covered each year. Figures should therefore be seen as reflecting the situation in any one year for those squares covered.

EURASIAN COLLARED DOVE *Streptopelia decaocto* (B, W)

Greatly under-reported, especially breeding records.

F Up to 10 Blackness in Feb, Mar, Sep and Nov.

S Breeding season: 3 Callander 29 May. Winter: 12 Hilton Fm, Dykehead 6 Nov.

COMMON CUCKOO *Cuculus canorus* (B)

Arrival² in Apr: 1 Lanrick, Doune 15th was 9 days earlier than in 2009, 10 days earlier than in 2008 and 2007. This was followed by 2 singing males at Flanders Moss 24th; singles Carron Valley Res 27th and 2nd May; Bows, BoD and Ardcarraig, L Doine 29th.

F One singing near Strathavon Fm, Darnrig Moss 15 May.

C One R Devon, Alva 5 Jun.

S May: 3 Flanders Moss 6th, with 2 there 26th and 1 on 1st Jun; 1 Tigh Mor, L Achray 5th; 1 L Rusky 7th; 1 L Katrine 8th; singles Bracklinn, Callander 9th and 24th; 1 Brig o'Turk 15th; 1 L Arklet 17th; 1 mobbed by Meadow Pipits, L Lubhair 20th; 2 Auchessan, G Dochart 20th; 2 M and F looking for nest Poldar Moss 21st with M there 2nd Jun; 1 Cringate Muir 25th; 1 Keltie Water - Alt-na-Criche, Callander 29th. June: 1 G Finglas 2nd; 1 Sheriffmuir 4th; M calling Wharry Burn near Cauldhame, Sheriffmuir 6th with F there and egg in Meadow Pipit nest 22nd; 1 Gart/Cambusmore GP 7th.

BARN OWL *Tyto alba* (b, w)

Despite the harsh winter of 2009/10, birds were reported from a wider area than in 2009. Good number of breeding pairs (6 prs producing 15 fledglings) in the Doune area in a year of generally poor breeding attempts. Next year may show how these birds fared in terms of breeding success and whether the prior apparent spread continued.

F Linlithgow: singles Melonsplace 22 Sep and Champany 22 Nov. 1 M9/M876 junction Stenhousemuir 8 Nov.

C One Alloa East 30 Nov.

S Singles Dunblane 1 Jan, Ashfield 21 Jan with 1 long dead Carse of Lecropt 31 Jan. Breeding season: 3 prs bred Argaty, BoD. Nest Upper Lanrick, Doune 27 Apr. 1 Stirling 9 Jul. Winter: singles Stirling 2 and 21 Nov; Airthrey, BoA 30 Nov.

TAWNY OWL *Strix aluco* (B, W)

F One, Liddle Drive, Bo'ness 5 Jan.

C One Gartmorn 14 Feb.

S Dunblane: singles on 3 Jan, on 26 and 27 Mar, 26 Apr and 27 May (Holmehill) and on 8 May. Singles Argaty, BoD 10 Jan, Doune 18 Jan and Airthrey, BoA 5-7 Feb. 5 calling in afternoon Corrie, L Ard Forest 20 Mar. Breeding pr Drumloist 3 May. 1 Bracklinn, Callander 24 May. 3 fully grown juvs Ballinluig, Balquhiddier 18 Jun.

LONG-EARED OWL *Asio otus* (b, w)

C One near Dollar 18 Sep (KB).

S One Thornhill 25 Feb (DOE).

SHORT-EARED OWL *Asio flammeus* (b, W)

A single record this year. For this rather local breeder, a more systematic survey of known breeding areas and potential breeding sites would be of value.

S One L Katrine 5 Jan (DOE).

² Spring arrival and autumn departure dates are not recorded systematically at the same locations with the same effort and coverage across years. Changes between years should therefore be seen as indicative only and not be interpreted as reflecting true phenological variation.

COMMON SWIFT *Apus apus* (B)

Spring arrival in May: 3 Coneyhill, BoA; 1 over A977 NE of Kennet and 10 Skinflats 4th were 3-7 days later than in the last 5 years (27th April-1st May). This was followed by 3 Aberfoyle and 5 Holmehill, Dunblane 8th and Stirling centre 11th.

Autumn departure in August: 18 Coneyhill, BoA 2nd decreased to 2 on 5th with 7 there at Keir Street on 8th and 1 Bo'ness 13th. This was between 7 days later and 17 days earlier than during the preceding 5 years (6th-30th August).

- F Twenty-four Bo'ness 23 May. 110 Skinflats 7 Jun with 500⁺ there 9 Jun. 4 nests Blackness 20 Jul.
- C Two Ben Cleuch 23 May.
- S Fifteen Dunblane 13 May. 8 King's Park, Stirling 25 May and NW Callander 29 May. 44 Ochiltree/Hydro, Dunblane 29 Jul.

COMMON KINGFISHER *Alcedo atthis* (b, w)

- F R Carron: singles Carronshore 9 Jan and 19 Sep; Stenhousemuir 17 Jan; 3 on M876-Larbert stretch 19 Sep with 2 there 14 Oct. Carronshore Burn, Carronshore: 1 on 20 Nov. Skinflats tidal exchange: singles 19 Sep; 7 Oct; 3, 5 and 17 Nov. Elsewhere singles Kinneil 28 Feb and Falkirk 10 Jun.
- C R Devon: 1 B934-Crook of Devon stretch 19 Oct and 23 Nov; Dollar-Tillicoultry stretch: singles 31 Jan, 24 Sep and 19 Nov; Tillicoultry-Alva stretch: singles 20 Feb, 19 Mar, 10 Oct, 4 Dec: Alva-Tullibody Br stretch: 10 Sep and 9 Oct; A907-Cambus Weir: 1 on 15 Dec. R Black Devon: 1 Blackdevon wetlands 26 Oct. Elsewhere singles Gartmorn Dam 27 Jul; Inglewood Pond, Alloa 9 Sep; Cambus Pools 24 Sep (2) and 20 Nov.
- S L Lubnaig: 1 on 11 Feb. L Venachar: 1 at E end 6 Jan. Eas Gobhain: singles at Callander 19 Jan and 26 Sep. R Teith: singles Callander 19 Dec, Doune 1 Jan, W Row-Forth conf 13 Mar and 10 Oct. R Forth: 1 Carse of Lecropt 10 Oct with 2 there 14 Nov, 2 R Teith-Allan conf 14 Nov. Allan Water: 1 Dunblane 2 Jan with 2 there 20 Oct and 1 on 30 Oct; 2 BoA 4 Aug with 1 there 14 Oct. Elsewhere: 1 Blairdrummond 25 Jul.

EUROPEAN GREEN WOODPECKER *Picus viridis* (B, W)

Mainly concentrated in SE of recording area but a couple of records from further afield this year.

- C Alva: singles along R Devon 4 Apr and 8 Aug, at Woodland Park and Drove Rd 11 Apr and 24 Oct. 1 R Devon, Dollar-Tillicoultry 24 Sep.
- S Dunblane: singles Holmehill 6 Jan and 26 Apr; Hydro 5 Apr; Ledcameroch 30 Nov and 2 Dec. Singles Rednock, Port of Menteith 13 Mar; Argaty, BoD 28 Mar; Sheriffmuir 17 Apr; Mine Wood, BoA 24 Apr; Pier Rd, Killin 10 May; Letter, L Katrine 2 Jun; Airthrey, BoA 9 Jul; Badivow, L Ard Forest 25 Sep.

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

- F Kinneil: singles 18 Jan and 14 Aug with 2 there 17 Oct and 3 Dec, 1 at Kinneil House 24 Apr. Singles Bryce Avenue, Carron 1 to 7 Jan; Liddle Drive, Bo'ness 3 and 5 Jan; Wallacestone, Polmont 25 Jan; Birkhill, Grangemouth 7 and 13 Apr; Tod Hill, Larbert 3 Jun; F with 2 juvs Black Loch, Limerigg 28 Jun. Dunmore Woods: 1 on 6 Jul with at least 4 there 21 Sep.
- C Singles Gartmorn 6 Jan and Tullibody 3 Feb. 1 calling Castlebridge Business Park, Forestmill 27 Feb, 13 May, 13-15 and 29-30 Dec. 2 Woodland Park and Drove Rd, Alva 11 Apr.
- S BoA: M and F Alexander Drive 4 and 31 Jan; 1 Cocksburn Res 23 Jan; 1 Airthrey 7 Feb and 3 Nov; 1 Mine Wood 24 Apr; 2 BoA on 16 May; M Keir Street 24 May with a juv there on feeder 13-16 Jul and 16 Oct. Singles Corrie, L Ard Forest 20 Mar; Ledcameroch, Dunblane 21 Mar; drumming Plean CP 3 Apr; Carron

Valley Res 2 May and 19 Nov; L Achray 3 May and 16 Oct. 2 Flanders Moss 8 May with 3 at Cardross Br there 19 Sep. 2 Ardeonaig, L Tay 17 May. F and 2+ juvs Auchessan, G Dochart 14 Jun. 1 Ben Venue car park 17 Jun. 2 Holmehill, Dunblane 25 Sep.

SKY LARK *Alauda arvensis* (B, W)

BBS: recorded at 1.6 b/lkm.

- F One hundred and twenty Brackenlees, Skinflats 1 Oct.
- C Forty-eight Park Fm, Clackmannan 26 Oct.
- S Carse of Lecropt: ca.80 on 20 Feb with ca. 50 there 29 Sep. 54 Arnieve, Blairdrummond Moss 23 Feb.

SAND MARTIN *Riparia riparia* (B)

BBS: recorded at 1.0 b/lkm. Arrival in Mar: 1 Tillicoultry 19th was in the middle of the arrival window during the preceding 5 years, being between 15 days late and 11 days early (range: 4th to 30th Mar). The next birds were 7 BoA 21st and 2 Doune 28th. Autumn departure: 25 Ardochyle, G Dochart 1st Aug, an unspecified number R Teith at Callander 9th and 20 Dunblane after thunderstorm 7th Sep. This was well within the departure window of the last 5 years, being between 21 days later and 31 days earlier (range: 17th Aug to 8th Oct).

- F Seventy Skinflats 17 Apr.
- C Fifty Gartmorn 22 Apr.
- S Forty BoA 9 Apr. 45 at Laighills, Dunblane colony 23 Apr. Ca. 50 apparently active nest holes Ardcarnaig, L Doine 29 Apr. Ca. 50 active nest holes R Balvag, Balquhiddier 4 May. Ca. 25 active nest holes Low Botaurmie, G Lochay 10 Jun. Ca. 15 active nest holes Ardenoig, L Tay 21 Jun.

BARN SWALLOW *Hirundo rustica* (B)

BBS: recorded at 2.9 b/lkm.

Spring arrival in Apr: 4 Carse of Lecropt 4th was towards the late end of the arrival window of the last 5 years, being 29 days late and 2 days earlier (range: 6th Mar to 6th Apr). This was followed by singles at BoA 5th, Blairdrummond 6th and Fallin 7th; 2 Dunblane 7th; 3 Bryce Avenue, Carron 7th and 2 G Finglas Res 11th.

Autumn departure in Sep: 50 Cardross Br, Flanders Moss and 90 Skinflats tidal exchange 19th; 2 Gartmorn 21st; 4 Cambus Pools 24th; 4 Blackgrange 25th. In Oct: 2 Hutchison, Ashfield and 1 Laighills, Dunblane 3rd. This was between 2 and 30 days earlier than during the last 5 years (range: 5th Oct to 2nd Nov).

- C Thirty R Devon at Alva 12 Sep.

COMMON HOUSE MARTIN *Delichon urbica* (B)

Arrival in Apr: 5 Allan Water, BoA 6th was between 1 and 10 days earlier than during the preceding 5 years (range: 7th to 16th). This was followed by 5 Bryce Avenue, Carron 7th; 1 Lionthorn, Falkirk 9th.

Departure in autumn: 70 Cardross Br, Flanders Moss 19th; 15 Skinflats tidal exchange 20th; 4 Dykedale, Dunblane 29th and 2 Cambus Pools 12th Oct. This was between 2 and 31 days later than during the preceding 5 years (range: 11th Sep to 10th Oct).

- F Thirty Skinflats lagoons 9 Jun.
- C Twenty Cocksburn, BoA 26 May.
- S Keltie Water, Callander: 8 Allt-na-Criche, 12 Braeleny Fm, 25 Pumping Station and 10 NW Callander 29 May. Ca. 30 Innishewan, G Dochart 14 Jun. 4 nests Coneyhill, BoA 20 Jun.

TREE PIPIT *Anthus trivialis* (B)

Arrival in Apr: 1 Beinn Dubhchraig 24th was towards the latter end of the arrival window of the last 5 years, being 12 days later and 3 days earlier (range 12th to 27th). This was followed by 4 Carron Valley Res 27th and 1 Ardcarnaig, L Doine 29th.

- S Bracklinn, Callander: 2 on 5 May with 1 there 29 May. 1 Flanders Moss 8 May. 1 Ben Cleuch 23 May.
- MEADOW PIPIT *Anthus pratensis* (B, W)
BBS: recorded at 5.4 b/lkm. Scarce mid-winter.
- F At least 30 Skinflats lagoons 24 Apr were passing through with White Wagtails. 120 Powfoulis and 40 Skinflats tidal exchange 9 Sep.
- S Thirty Laighills, Dunblane 1 Apr. 33 Fintry 9 Sep.
- EURASIAN ROCK PIPIT *Anthus petrosus* (w)
F One Skinflats 11 Nov with 2 there 16 Dec. 1 Blackness 17 Dec (SP, AMF).
- GREY WAGTAIL *Motacilla cinerea* (B, w)
F R Carron: 1 Carronshore 21 Feb and 19 Dec; 1 Carron, Stenhousemuir 21 Feb; 2 on M876-Larbert stretch 14 Nov
- C Singles R Devon, Alva-Tullibody Br 17 Jan and 21 Feb. 2 Alva Glen 23 May. 2 Cambus Pools 24 Sep. 1 Castlebridge Business Park, Forestmill 6 Dec was tailless.
- S Allan Water: singles BoA 19 Feb and Darn Road 28 Feb. 1 Dunblane W 10 May. 4 Laighills, Dunblane 3 Jul. 2 R Teith, Callander 9 Aug. Polmaise lagoons, Fallin: singles 21 Oct and 18 Nov.
- WHITE WAGTAIL (PIED WAGTAIL) *Motacilla alba yarrellii* (B, w)
Very few winter records received compared to the 2005-2009 period: 2 Jan records (mean: 4.4): singles Ledcameroch, Dunblane 1 Jan and Tullibody 17 Jan. 1 Feb record (mean: 4.4): 6 River Devon, Alva 21 Feb. 3 Nov records (mean: 4.0): 1 Airthrey, BoA 3 Nov and unspecified numbers Carse of Lecropt and BoA 14 Nov. No Dec records received (mean: 5.0).
- F Skinflats lagoons: 7 on 15 Mar, 65 on 21 Apr, 19 on 23 Apr. 68 in newly sown field at Powfoulis 22 Sep.
Birds of the Continental European race *M.a.alba*.
- F Skinflats: 6 on 21 Apr, 37 on 24 Apr with 3 there 4 May.
- BOHEMIAN WAXWING *Bombycilla garrulus* (w)
Following the invasion of late 2008 with small flocks staying around until early April 2009, late October 2010 saw yet another good crop of Waxwings, again primarily in the Falkirk-Grangemouth and the Stirling-Dunblane-Doune areas. However, this time flocks built up rapidly until late November before moving on south with few birds left during the very cold December.
- F Bo'ness: 18 at Grangepans 24 Oct, 14 there 14 Nov and 40 at golf club 6 Dec. Bryce Avenue, Carron: 30 on 31 Oct, 12 feeding on Rowan berries 13 Nov and 45 on 20 Nov. Falkirk: 30 on 1 Nov, 35 on 2 Nov, 150 feeding on Rowan St. Mungo's school 3 Nov, 90 on 5 Nov, 60 on 7 Nov, 40 on 10 Nov down to 30 on 15 Nov and 10 Gartcows 25 Nov. Grangemouth: 20 on 2 Nov, 49 on 10 Nov and 140 on 12 Nov. Airth: 32 on 7 Nov, 80 on 15 Nov and 30 on 24 Nov. Polmont: 60 on 8 Nov, 100 on 12 Nov, 200 on 13 Nov and unspecified numbers Glemis Gardens 18 Nov. 150 Laurieston 9 Nov and 100 on 15 Nov. 50 Dunmore 15 Nov. 15 Skinflats tidal exchange 24 Nov.
- C Sixty Tillicoultry 27 Oct. 140 Sauchie 4 Nov. 10 Alva 13 Nov. 35 Alloa W Business Park 14 Nov. 80 in two groups along the Dollar-Tillicoultry stretch of the R Devon 19 Nov.
- S Twenty-two Craigton Fm, Ashfield 22 Oct. Dunblane: 30 Highfields 24 Oct, 30 on 26 Oct, 75 on 27 Oct, 300 on 28 Oct, 420 on 29 Oct, 430 on 30 Oct, 300 on 31 Oct, 875 on 2 Nov, 150 on 3 Nov, 60 on 12 Nov, 100 on 13 Nov, 38 Newton Crescent 16 Nov and 30 there 21 Nov. BoA: 35 Airthrey 25 Oct, 50 on 27 Oct, 150 Cornton 30 Oct, 220 on 1 Nov, 250 on 2 Nov, 220 on 7 Nov and 25 on 3 Dec. Stirling: 300 on 28 Oct, 180 on 31 Oct, 100 on 1 Nov, ca. 150 Viewforth and 100

Royal Infirmary 2 Nov, 300 Springkerse 4 Nov, 500 on 4 Nov, 140 Springkerse and 80 Brucefields golf course 6 Nov, 35 Viewforth 13 Nov with ca. 35 there 18 Nov, ca. 15 Broomridge 5 Dec and 1 Forthside Way 12 Dec. Doune: 200 on 30 Oct, 80 on 4 Nov, 53 on 7 Nov, 110 on 13 Nov and 15 Buchany 20 Nov. Fallin: 8 on 1 Nov, 65 on 4 Nov, 22 on 7 Nov and 1 on 25 Dec. Elsewhere: 40 Blairdrummond 26 Oct with 100 there 28 Oct. 17 Aberfoyle 27 Oct and 50 on 5 Nov. 11 Drymen, L Ard Forest 31 Oct. 2 Gargunnoch 1 Nov. 50 Argaty, BoD 2 Nov. 200 Bannockburn 7 Nov. 44 Cowie 7 Nov.

WHITE-THROATED DIPPER *Cinclus cinclus* (B, W)

- F Six R Carron, M876-Larbert stretch 14 Nov. 3 (1 in song) Bonny Water, Underwood, Banknock 13 Dec.
- C R Devon: 1 at Alva 4 Apr; 10 on B934-Crook of Devon stretch 28 Sep with 8 there 23 Nov and 7 on 30 Dec; 8 Dollar-Tillicoultry 23 Jan with 5 there 20 Oct and 9 on 19 Nov; 5 Tillicoultry-Alva 20 Feb. 2 Cambus Pools 20 Nov.
- S R Teith: 1 Callander 9 Aug with 9 there 19 Dec; 6 Lanrick Estate 10 Jan with 5 there 17 Oct and 19 Dec. 1 Ardoch Burn, Kilbryde, BoD 10 Oct. Allan Water, Dunblane: 1 on 17 Mar, 3 territories there (up to 4 in past) 23 Apr, singles 9 and 10 May.

WINTER WREN *Troglodytes troglodytes* (B, W)

Widespread and common but under-recorded. BBS: recorded at 0.98 b/lkm.

- C Eight Woodland Park and Drove Rd, Alva 11 Apr. 10 Cambus Pools 24 Sep.
- S Nine Holmehill, Dunblane 8 May and 10 on 24 Jul.

DUNNOCK *Prunella modularis* (B, W)

Widespread and common but under-recorded. BBS: recorded at 0.5 b/lkm.

- S Ten King's Park, Stirling 9 Mar and 5 on 24 Apr.

EUROPEAN ROBIN *Erithacus rubecula* (B,W)

Widespread and common but under-recorded. BBS: recorded at 0.8 b/lkm.

- S Thirteen King's Park, Stirling 13 Mar. Dunblane: 15 on 9 May with 10 at Holmehill 27 May, 13 there 25 Sep and 12 on 24 Oct. BoA: 20 on 16 May and 12 Airthrey 11 Oct. 15 Callander W 15 Oct.

COMMON REDSTART *Phoenicurus phoenicurus* (B)

Arrival in Apr: pr Ardcarraig, L Doine 29th was 2 to 12 days later than in the preceding 5 years (range: 17th to 27th). This was followed by singles Tigh Mor, L Achray 2nd and 4th May and males at Doune Lodge and Flanders Moss 6th May (NB, FAM, DOE).

- F Skinflats: singles 31 Jul and 6 Aug and juv on 15 Aug (ACC, MVB, AB).
- S Singles Bracklinn, Callander 9 May and Dun Dubh Wood, Aberfoyle 17 May. Pr nested in Flanders Moss viewing platform 1 Jun (DOE, DT, JTMT).

WHINCHAT *Saxicola rubetra* (B)

Spring arrival in May: 1 Sheriffmuir Inn 3rd was later (by 1 to 6 days) than in the past 5 years (range: 27th April to 2nd May). This was followed by 1 Flanders Moss 6th and 3 Bracklinn, Callander 9th and 3 M Braeleny, Callander 11th. Autumn departure: 1 Cardross Bridge, Flanders Moss 19 Sep was within the departure window, being between 42 days later and 22 days earlier than in the preceding 5 years (range: 8th August to 11th October). The large differences are no doubt a reflection of observer coverage rather than true variation.

- F One Skinflats 24 Jul.
- C Three Ben Cleuch 26 Jun.
- S Keltie Water, Callander: 3 Allt-na-Criche and 1 Creagan an Lin both 29 May.

EURASIAN STONECHAT *Saxicola torquata* (b, w)

Fewer records this year, like in 2009, are a reflection that the species did not

cope well with the recent cold winters.

- F M Parkhead, Slamannan 18 Nov.
- C One Blackdevon wetlands 23 Nov.
- S One Carse of Lecropt 5 Mar. 2 L Rusky 14 Mar. M Sheriffmuir Inn 5 May with pr there 4 Jun. 1 L Katrine 8 May. Pr and 4 juvs Botaurnie, G Lochay 10 Jun. Pr bred Doune Lodge 29 Jul. 2 Ardchyle, G Dochart 1 Aug. 4 Bochastle Hill, Kilmahog 1 Sep.

NORTHERN WHEATEAR *Oenanthe oenanthe* (B)

Spring arrival in Mar: 1 G Cononish 27th was well within the arrival window of the preceding 5 years, being between 6 days late and 10 days early (range: 21st Mar to 6th Apr). This was followed by M Doune Lodge 28th.

Autumn departure in Sep/Oct: singles Kinneil 4th, 16th and 20th; Cardross Bridge, Flanders Moss 19th and Stob Binnein, Crianlarich 11th Oct. This was towards the end of the departure window of the preceding 5 years, being 36 days later and 2 days earlier (range: 5th Sep to 13th Oct).

- F Fourteen Skinflats 24 Apr. 2 Torwood Castle, Stenhousemuir 3 May. Singles Kinneil 5 May and Tod Hill, Larbert 11 and 25 Aug.
- S One Blairlogie 10 Apr, 2 Sheriffmuir 23 Apr, 3 M Doune Lodge 25 Apr. Singles Cocksburn Res, BoA 29 Apr, Sheriffmuir Inn 1 and 6 May, L Katrine 8 May. F Carse of Lecropt 2 May was presumed to be of the *leucorhoa* (Greenland) race.

*RING OUZEL *Turdus torquatus* (b)

- S One L Katrine 10 Apr (DOE).

COMMON BLACKBIRD *Turdus merula* (B, W)

BBS: recorded at 2.9 b/lkm.

- F Three fledged Y Bryce Avenue, Carron 10 May. 20 Skinflats Lagoons 5 Dec.
- C River Devon at Alva: 10 on 2 May, 5 Jun, 17 Jul with 12 there 11 Oct. 10 Woodland park and Drove Rd, Alva 9 May. 10 Gartmorn 6 Dec. 12 Cambus Pools 21 Dec.
- S Dunblane: Holmehill 11 on 20 Feb, 10 on 13 Mar and 8 May and 11 on 24 Oct; also 10 on 9 May. 23 feeding on fallen apples Leewood Crescent 18 Dec. Stirling: 12 King's Park 9 Mar with 27 there 24 Apr, 10 on 27 Apr, 14 on 4 and 11 May and 11 on 25 May. BoA: 10 Airthrey 11 May and 20 there 16 Oct; also 12 on 16 May.

FIELDFARE *Turdus pilaris* (W)

Spring departure in Mar: 3 Sauchans, Doune 13th and ca. 50 Carse of Lecropt 21st. This was between 4 and 54 days earlier than in the preceding 5 years (range: 25th Mar to 14th May). The large differences are no doubt a reflection of observer coverage rather than true variation. Autumn arrival in Oct: 25 Kinneil 17th. This was within the range of the preceding 5 years, being between 10 days later and 5 days earlier (range: 7th to 22nd Oct). This was followed by 16 Stirling 19th. ca. 70 R Devon, Dollar-Tillicoultry; 20 Ashfield; 445 in three flocks Auchinlay, Dunblane; ca. 100 L Rusky; ca. 70 Wester Corshill, Thornhill all on 20th. 70 Blackdevon wetlands 21st.

- F Skinflats: 500 passing tidal exchange 25 Oct, 300 at lagoons 5 Dec and 65 there 19 Dec. 100 Powfoulis 29 Oct. 150 Airth 28 Nov.
- C 80 Hillend, Clackmannan 8 Feb. 1,500+ Blackdevon wetlands 26 Oct. Ca. 500 R Devon Dollar-Tillicoultry 19 Nov.
- S Eighty Craigmarnhall, Dunblane 27 Oct. 120 Br of Goodie, Thornhill Carse 27 Oct. 90 Cambuskenneth 28 Oct. Ca. 300 Carse of Lecropt 14 Nov.

SONG THRUSH *Turdus philomelos* (B, W)

Under-recorded.

Again fewer winter records. No Jan, Feb and Nov records. Dec: 1 Cambus and 10 Skinflats lagoons 5 Dec. No records from the breeding season.

- C Ten Blackgrange WeBS 10 Oct.
 S Twenty Airthrey, BoA 11 Oct.
- REDWING *Turdus iliacus* (W)
 Spring departure: No true departure dates were received. 7 Laighills, Dunblane 27 Feb was the latest record.
 Autumn arrival in Oct: 1 Kippenross, Dunblane, 2nd, was within the typical window of the preceding 5 years, being 5 days later and 10 days earlier (range: 27th Sep to 12th Oct). This was followed by 4 The Crescent, Dunblane 3rd, 2 Wester Cambushinnie, Kinbuck 5th. Then 100+ Carse of Lecropt; 40 Newton Crescent; Dunblane; 4 Kilbryde, BoD, all 10th; 20 Airthrey, BoA 11th and 25 Cambus pools 12th.
- F Sixty passing Skinflats tidal exchange 25 Oct.
 C Forty R Devon at Alva 17 Oct and 7 Nov. 20 Gartmorn Dam 18 Oct. 50 Blackdevon wetlands 26 Oct.
 S BoA: 41 golf course 14 Oct, 40 Airthrey 25 Oct, 35 eating *Pyracantha* berries Coneyhill 23 Dec.
- MISTLE THRUSH *Turdus viscivorus* (B, W)
 Under-recorded. Few noteworthy records received this year.
- F Twenty Skinflats lagoons 5 Dec.
 S Breeding season: singing Viewforth, Stirling and Plean CP 6 Kilbryde, BoD 10 Oct. 8 Airthrey, BoA 11 Oct and 3 Nov.
- COMMON GRASSHOPPER WARBLER *Locustella naevia* (b)
 Spring arrival in Apr: 1 Skinflats 23rd was within the remarkably stable arrival window of the preceding 5 years (range: 17th to 27th). This was followed by 2 at Skinflats and one at Bein Dubhchraig on 24th and 3 there on 25th and 1 at Gartur, Cambusbarron 29th.
- F Skinflats: 1 on 2 May with 3 there 4 May, 1 singing on 3 Jun, 1 there on 7 Jun, 3 singing on 27 Jun, singles 15 Jul and 31 Jul and 1 singing 6 Aug. Kinneil: 1 on old tip 5 May, 1 on 8 May and 1 near lagoon on 22 Jul. 1 singing Darnrig Moss 22 Jun.
 C Three M Blackdevon wetlands 14 Jun.
 S M Drumloist 3 May. 3 M Flanders Moss 6 May. 1 Fallin 9 May. 1 singing Innishevan, R Dochart 30 Jun.
- SEDGE WARBLER *Acrocephalus schoenobaenus* (B)
 Spring arrival in Apr: 1 Polmaise Lagoons, Fallin 22nd was at the early extremity of the remarkably stable arrival window over the preceding 5 years (range: 22nd to 30th). This was followed by 1 Greenyards, Dunblane 2 May; 1 singing Skinflats 4 May, 4 Gartmorn and 6+ Kinneil 5 May; M Flanders Moss 6 May and 3 Kinneil 8 May.
 Autumn departure in Aug: 5 Kinneil 14th was in the early part of the wide departure window of the preceding 5 years, being between 4 days later and 39 days earlier (range: 10th Aug to 22nd Sep). The large differences are no doubt a reflection of observer coverage rather than true variation.
- F Skinflats: 5 singing 16 May with singles 22 May (lagoons) and 3 Jul. 1 Falkirk stadium 20 Jun.
 C Two singing Cambus Pools 22 May with 2 also there 6 Jun. 1 Gartmorn Dam 29 May with 3 there 17 Jun. 1 R Devon at Alva 5 Jun.
 S One Cambuskenneth 10 and 31 May. 1 Cocksburn Res, BoA 12 May and family Polmaise Lagoons, Fallin 22 Jul.
- EURASIAN BLACKCAP *Sylvia atricapilla* (B)
 Winter records: BoA: singles (as in 2009) in Alexander Drive 4 Jan, 31 Jan and 28 Feb; in unspecified locations 10 Jan and 25 Feb; Airthrey 16 Nov and Keir Street

31 Dec. 1 Causewayhead, Stirling 20 Feb. 1 Airth 11 Oct and 25 Nov. M Callendar Grange, Falkirk 27 Dec. Spring arrival in Apr: 1 singing Skinflats 10th was well within the arrival window of the preceding 5 years (range: 5th to 13th), though the picture is potentially muddled by over-wintering birds. This was followed by singles Liddle Drive, Bo'ness and Burghmuir, Stirling 13th; 4 Gartmorn and M Springwood Avenue, Stirling 22nd; Carriden House Bo'ness (2), Bo'ness sewage works (3), W of Blackness, in song Dunmore Woods, Kinneil (3); singing Coneyhill, BoA and King's Park, Stirling all on 24th; 3 Holmehill, Dunblane 26th and 2 King's Park, Stirling 27th.

Autumn departure in Sep: 1 Kinneil 18th is similar to the only available dates in 2006 (13th) and 2008 (24th).

- F One singing Skinflats 4 May.
 C Gartmorn: 4 on 5 May with 1 there 14 and 29 May and 3 on 17 Jun. Alva: singles at R Devon 2 May and 11 Jul and 2 Woodland Park and Drove Road 9 May.
 S Stirling: 1 King's Park 25 May. BoA: M Keir 3 May, F Alexander Drive 8 May. Dunblane: 2 Holmehill 8 May with 1 there 27 May and 24 Jun, 2 on 24 Jul and 1 on 24 Aug with 2 elsewhere in Dunblane 9 May. 3+ Dun Dubh Wood, Aberfoyle 17 May. 2 Bracklinn, Callander 29 May. 1 singing Plean CP 27 Jun.

GARDEN WARBLER *Sylvia borin* (B)

Spring arrival in Apr: 1 Carron Valley Res 27th was well within the range of the past 5 years, being between 8 days later and 6 days earlier (range: 19th April to 2nd May). This was followed in May by 1 singing Skinflats 4th, 3 Gartmorn Dam 5th and 2 Dunblane 8th and 9th.

Autumn departure: no dates received.

- F Pr (M in song) Skinflats 16 May. 1 singing Blackness 17 May.
 C Alva: singles in Glen 23 May, at R Devon 5 Jun and Woodland Park and Drove Rd 27 Jun. 4 Gartmorn 17 Jun.
 S Three Dun Dubh Wood, Aberfoyle 17 May. 1 Dykehead, Flanders Wood 1 Jun. 1 singing Plean CP 7 Jun.

LESSER WHITETHROAT *Sylvia curruca*

- F One Skinflats 7 and 9 Jun in dense shrub cover. Only two bursts of song in 2 hours on 9 Jun (GG, AB). This is the 7th record for the recording area since modern recording began in 1974.

COMMON WHITETHROAT *Sylvia communis* (B)

Spring arrival in May: 1 Biggins Fm, Dunblane 2nd was slightly (between 2 and 9 days) late compared to the previous 5 years (range: 23rd to 30th Apr). This was followed by 2 singing Torwood, Stenhousemuir 3rd; 2 singing Skinflats 4th; 8 Kinneil 5th with 13 there 8th; 1 Dunblane 9th.

Autumn departure in Aug: 1 Dykedale, Dunblane 10th, then 3 Kinneil 14th. This was within the early part of the departure window of the past 5 years, being between 12 days later and 40 days earlier (range: 2nd Aug to 24th Sep). The large differences are no doubt a reflection of observer coverage rather than true variation.

- F Seven singing Skinflats 16 May. 4 fledged Y fed by ad there 12 Jun.
 C Two Gartmorn Dam 14 Jun. 4 R Devon at Alva 11 Jun.
 S One BoA 16 May. 3 King's Park, Stirling 25 May. 1 Duke's Pass, Aberfoyle 17 Jun.

WOOD WARBLER *Phylloscopus sibilatrix* (B)

Fewer and fewer records are being received. This is in line with the general national decline.

Spring arrival in May: 3 M Bracklinn, Callander 5th (DOE) were between 5 and 18 days later than in the preceding 5 years (range: 17th to 30th Apr).

- S One Dun Dubh Wood, Aberfoyle 17 May. 4 Auchessan, G Dochart 20 May

included 1 collecting nesting material (DT, NB).

COMMON CHIFFCHAFF *Phylloscopus collybita* (B)

Winter records: 6 Kinbuck 26 Jan. 1 Fallin 1 Nov.

Spring arrival in Mar: 1 Holmehill, Dunblane 27th was between 14 days later and 4 days earlier than in the preceding 5 years (range: 13th to 31st). This was followed by 2 Dunblane 28th, then in Apr 1 Gartmorn Dam 1st, Lake of Menteith and 2 singing Plean CP 3rd.

Autumn departure: singles singing Inverhaggernie, Crianlarich and Lochdochart House, L Lubhair and 1 Skinflats 20th Sep; Cambus Pools 24th Sep; 2 Holmehill, Dunblane 25th Sep; 1 Ochiltree, Dunblane 3rd Oct and singles Burghmuir, Stirling and Broomridge, Stirling 4th Oct. These were towards the later end of the departure window, being between 17 days later and 2 days earlier than in the preceding 5 years (range: 17th Sep to 6th Oct).

- F Skinflats: 2 singing 10 Apr and 3 on 4 May. 2 W of Blackness; 1 Kinneil; 3 Carriden House and 5 sewage works Bo'ness and 1 Dunmore Woods all 24 Apr. 3 singing Torwood, Stenhousemuir 3 May. 10 Falkirk stadium 20 Jun.
- C Alva: 1 Woodland Park and Drove Rd 11 Apr and 6 R Devon 11 Jul. 6 Gartmorn Dam 22 Apr.
- S Stirling: 1 Laurel Hill 5 Apr. 1 Broomridge 8 Apr, 1 Burghmuir 9 Apr, 2 King's Park 9 Apr with 4 there 24 Apr and 1 on 27 Apr. 1 Blairlogie 10 Apr. 2 Holmehill, Dunblane 10 and 26 Apr. 1 Dun Dubh Wood, Aberfoyle 17 May.

WILLOW WARBLER *Phylloscopus trochilus* (B)

BBS: recorded at 1.3 b/lkm. Spring arrival in Apr: 1 singing Skinflats 10th was within the arrival window of the past 5 years, being between 7 days later and 4 days earlier (range: 3rd to 14th). This was followed by singles Woodland Park and Drove Rd, Alva and G Finglas Res 11th, 5 Kippen curling pond 12th and 3 singing Gartmorn Dam 14th. Autumn departure: 2 Skinflats 20th Sep, 1 Allan Water 26th and 2 Kinneil 3rd Oct. The latter was towards the later end of the departure window, being between 19 days later and 3 days earlier than in the preceding 5 years (range: 14th Sep to 6th Oct).

- F Bo'ness: 3 Bo'mains Meadow, 3 town centre and foreshore, 3 sewage works, 1 Carriden House, 13 Kinneil, 3 Kinneil House and 2 W of Blackness, all 24 Apr. At least 5 singing Skinflats 24 Apr with 2 singing there 16 May. 25 Falkirk stadium 20 Jun.
- C Gartmorn Dam: 26 on 22 Apr, 22 on 5 May and 15 on 17 Jun.
- S Singles L Venachar and Thornhill 17 Apr. 11 Cocksburn, BoA 21 Apr. 11 King's Park, Stirling 24 Apr with 7 there 27 Apr. 11 Bracklinn Falls, Callander 29 May. 10 Keltie Water, Callander 29 May. 1 juv Polmaise lagoons, Fallin 22 Jul. 20 Airthrey, BoA 26 Aug.

GOLDCREST *Regulus regulus* (B, W)

Under-recorded. Few notable records were received this year.

SPOTTED FLYCATCHER *Muscicapa striata* (B)

Spring arrival in May: 3 Auchessan, G Dochart 20 May were later (by 1 to 11 days) than during the past 5 years (range: 9th to 19th). This was followed by 2 Dykehead, Flanders Moss 1 Jun. Autumn departure: 1 Fallin 9 Sep and 1 Skinflats tidal exchange 19 Sep. This was later (by 4 to 26 days) than during the preceding 5 years (range: 24th Aug to 15th Sep).

- F One Tod Hill, Larbert 3 Jun. 1 Skinflats 22 Aug.
- C One railway path, E Clackmannan 27 Jun.
- S Two Plean CP at possible nest site 2 Jun. Pr Doune Lodge 24 Jun. 1 Kippenross was the only record at this former regular breeding site. Pr with Y Anie, L Lubnaig 24 Jul. Pr with br/4 Blairdrummond 25 Jul. Pr with Y Keir, BoA 1 Aug.

EURASIAN PIED FLYCATCHER *Ficedula hypoleuca* (b)

- S M Little Drum wood, Loch Venachar 15 May and 1 Bracklinn, Callander 29 May were the only records received (JM, SM).

LONG-TAILED BUSHTIT (LONG-TAILED TIT) *Aegithalos caudatus* (B, W)

- F Nest at Kinneil 5 May. 14 Blackness 4 Oct. 11 Liddle Drive, Bo'ness 7 Dec.
 C Cambus Pools: 12 on 24 Sep, 20 there on 13 and 21 Dec. 10 Gartmorn Dam 6 Dec.
 S Thirteen Dunblane 7 Feb. Ad with 5 fledged Y Plean CP 7 Jun. 22 Airthrey, BoA 22 Sep. 10 Doune 31 Oct.

BLUE TIT *Cyanistes caeruleus* (B, W)

Under-recorded. BBS: recorded at 1.8 b/lkm.

- S Holmehill, Dunblane: 20 on 20 Jan, 24 on 7 Feb, 21 on 20 Feb, 10 on 27 Mar, 15 on 26 Apr, 28 on 14 Aug and 17 on 25 Sep. 20 King's Park, Stirling 24 Apr. 16 BoA 16 May.

GREAT TIT *Parus major* (B, W)

Under-recorded. BBS: recorded at 1.3 b/lkm.

- C Eight R Devon at Alva, 17 Jan.
 S Dunblane: 15 Holmehill 20 Feb with 11 there 10 Apr. BoA: 12 on 16 May. 1 singing Coneyhill on first day of thaw 30 Dec.

COAL TIT *Periparus ater* (B, W)

Widespread but under-recorded. No notable records received.

EURASIAN NUTHATCH *Sitta europaea*

Following its first appearance in 1999 and the first record of breeding in 2009, there were two breeding records this year and further sightings elsewhere. The species appears to have established a toehold in our area now.

- S BoA: 1 Alexander Drive 4 Jan; M and F calling at 2009 nest site in Mine Wood 4 May with F in nest 18 May; at railway station 13 May; Keir 1 Aug and 14 Nov (MVB, RSx, MA, DOE). Dunblane: singles Ledcameroch 2 Apr, 2 May and 29 Oct. Pr with nest Doune Lodge 25 Apr (CS, DOE). Pr present year-round Kippenross estate, Dunblane, following arrival in December 2009 but no breeding confirmed. The above represent the 12th to 22nd records in the recording area.

EURASIAN TREECREEPER *Certhia familiaris* (B, W)

Under-recorded.

- F Breeding season: Pineapple, Dunmore.
 C Breeding season: Gartmorn Dam.
 S Breeding season: W Dunblane, Balquiderrock Wood, Stirling. 3 Holmehill, Dunblane.

EURASIAN JAY *Garrulus glandarius* (B, W)

- F Three Bo'ness 13 Mar. 2 Dunmore woods 24 Apr.
 C One Dollar 2 Jan. 2 Dollarbeg 25 Mar. 3 R Devon, Dollar-Tillicoultry 20 Oct with 1 there 19 Nov. 1 Alva Woodland Park 24 Oct.
 S Singles Monachyle, L Voil 1 Feb, L Watston 13 Mar. BoA: 1 Hermitage Wood 16 Apr, 3 Mine Wood 24 Apr, 1 Keir Estate-Arnhall 13 May, 3 Airthrey 3 Nov. 2 G Balquhidder 4 May. Dunblane: singles in W 8 May, golf course 20 May, Ledcameroch 5 Dec. 2 Cringate Muir 25 May. Callander: 1 Keltie Water 29 May, 1 R Teith 9 Aug. Plean CP: 2 on 7 Jun, 3 on 22 Nov. 1 Cardross Br, Flanders Moss. Singles Carron Valley Res 21 Sep and 19 Nov. 1 Milton, L Ard 24 Oct. 2 Craigforth, Stirling 24 Oct. 2 Doune 31 Oct.

EURASIAN MAGPIE *Pica pica* (B, W)

Continues to be very scarce NW of Dunblane. Abundant around Stirling but is not usually as frequent in the west; large groups now widespread in Falkirk District. Only small groups recorded this year.

- F Eight Chasefield 21 Feb and 7 Mar.

- C Alva: 7 R Devon 7 Feb and 7 Woodland Park and Drove Rd 24 Oct.
 S Six Holmehill, Dunblane 20 Jan and 12 there 25 Sep. 1 Argaty, BoD 14 Feb. 10 King's Park, Stirling 9 Mar. 1 Lake of Menteith 23 Nov. 2 Callandrade, Callander 19 Dec.
- WESTERN JACKDAW *Corvus monedula* (B, W)
 Under-recorded. BBS: recorded at 3.0 b/lkm.
- S BoA: pr nested in chimney Keir Street, producing 2 juvs 18 May. 470 in roost flight over golf course 14 Oct with 340 there 28 Oct. Dunblane: 120 Craigarnhall 10 Oct.
- ROOK *Corvus frugilegus* (B, W)
 BBS: recorded at 2.1 b/lkm. Systematic counts of known rookeries (e.g. BoA, Gartmorn, Forth and Clyde Canal, Lake of Menteith, etc.) needed.
- F One hundred Glenhead, L Coulter Res 23 May.
 C Orchard Fm, Cambus: 22 nests 21 Apr.
 S Dunblane rookeries on 1 Apr: Victoria Hall 18 nests, Strathmore Avenue 10 nests, Holme Hill 69 nests, Kippendavie Rd 85 nests, Duthieston House/Queen Victoria School 47 nests. 150 Cocksburn Res 27 Jan. Dunblane: 130 Holmehill 20 Feb with 100 there 13 and 27 Mar and 10 Apr; 150 in unspecified location 9 May; 100 Ledcameroch 28 Nov. 600 Mackeanston, Thornhill 22 Feb.
- CARRION CROW *Corvus corone* (B, W)
 BBS: recorded at 2.9 b/lkm.
- C One hundred Gartmorn 27 Jan. 50 R Devon, Alva 7 and 21 Feb and 17 Oct with 60 there 7 Nov.
 S Sixty-two meat plant, Carse of Lecropt 5 Mar. 52 King's Park, Stirling 27 Apr.
- HOODED CROW *Corvus cornix* (b, w)
 S Eleven hybrids Leny House, Callander 19 Jan. G Dochart: 1 on 8 Feb, 1 at Ardchyle 1 Aug, 4 (1 hybrid) 24 Sep. 2 Meall Dhamh, Doire Earb 18 Apr. Balquhiddy: 1 in glen 4 May and hybrid E end L Voil 24 Sep. 2 Ben Venue car park 17 Jun. Outwith core area of NW Stirlingshire: Dunblane: hybrid Newton Crescent 16 Sep, singles Holmehill 19 Dec and Ledcameroch 27 Dec.
- NORTHERN RAVEN *Corvus corax* (B, W)
 There were again a number of reports from south/southwest of the core Callander-Doune-Dunblane area and NW Stirlingshire.
- F One > E Liddle Drive, Bo'ness 14 Jan. 1 Skinflats tidal exchange 23 Nov. 1 > S Airth 24 Nov.
 C One Tillicoultry 6 Jan. 1 Castlebridge Business Park, Forestmill 12 and 15 Feb and displaying there 4 Mar. 2 Ben Cleuch 23 May. 1 Cambus Pools 20 Nov. 2 R Devon, Dollar-Tillicoultry 15 Dec.
 S Core area: again no Doune Lodge roost data. 1 Stuc a' Chroin 21 Feb. 4 Benmore G plantation 8 Mar. 2 Stob Garbh 8 Mar. 2 G Finglas Res 11 Apr. 1 Twisten Hill 18 Apr. 1 Sheriffmuir 17 May. 1 Duke's Pass, Aberfoyle 17 Jun. 1 R Teith, Callander 9 Aug. 6 Kilbryde, BoD 10 Oct. Outside core area: 1 > N Plean CP 7 Feb. 2 Airthrey, BoA 1 Mar and 1 there 11 Oct. 1 Blairlogie 10 Apr. 2 Carron Valley Res 2 May. 2 > N Burghmuir, Stirling 21 Sep. 1 Craigton Fm, Ashfield 24 Oct. 2 Grant Drive, Dunblane 31 Oct. 2 Kinbuck 14 Nov. 2 Munnieston, Thornhill 23 Nov.
- COMMON STARLING *Sturnus vulgaris* (B, W)
 Greatly under-reported. BBS: recorded at 4.4 b/lkm.
- C One hundred Gartmorn Dam 6 Jan with 440 there 7 Oct.
 S Pr nested in eaves Keir Street, BoA 15 May but no Y seen.
- HOUSE SPARROW *Passer domesticus* (B, W)
 Under-recorded. BBS: recorded at 2.9 b/lkm.
- F Breeding season: Lionthorn, Falkirk; Blackness village and castle and High

Road, Maddiston.

- C Breeding season: R Devon, Alva.
 S Breeding season: King's Park, Stirling; Raploch, Stirling; Dunblane; Fallin; NW Callander and Cambuskenneth. Outside breeding season: 21 Kinbuck 13 Jan and 28 there 26 Jan. 45 Auchinlay, Dunblane 4 Aug. 220 Littleward, Thornhill Carse 11 Sep.

EURASIAN TREE SPARROW *Passer montanus* (B, W)

Very few large flocks again this year.

- F Skinflats area (lagoons, tidal exchange, Newton Rd): up to 9 recorded Mar to Aug and Oct to Dec with maxima of 15 at lagoons 31 Jul and 30 Brackenlees 30 Oct. 2 prs with Y at lagoons and 2 ads and 2 juvs at tidal exchange both 14 Jun and 12 (some juvs) in hedgerows at lagoons 15 Aug. Elsewhere 6 Dunmore 4 Jan. 2 South Alloa 17 Jan. 2 Blackness 5 Apr and 17 May with 4 fledged Y there 7 Aug and 4 on 16 Oct. 8 Airth 3 Oct.
 C One Tillicoultry 6 Jan. 2 railway path, E Clackmannan 27 Jan. 7 Brothie Burn, Gartmorn 30 Apr. 15 Blackgrange WeBS 25 Sep.
 S Dunblane (Sheriffmuir Rd, Grant Drive, Kippenross Cottages and estate, Stockbridge, Biggins Fm, West Dunblane, Ochiltree, Ryland Lodge): up to 9 recorded Jan, Mar, Apr, May, Jun, Jul, Oct-Dec with maxima of 11 W Dunblane 30 Jun and 10 on 7 Aug and 20 at Row 14 Nov. Nested Auchinlay 6 Jun. Elsewhere: 12 Fallin 12 Jan. 30 Thornhill 22 Feb. Flanders Moss: 6 Pencilles of Collymoon 10 Feb and 4 there 6 Nov, 26 Cardross Br 19 Sep. 2 Carse of Lecropt 5 Mar (Longleys) with ca. 50 on 10 Oct. 2 Keir St, BoA 6 Mar. 14 Sauchans, Doune 13 Mar. 3 Kinbuck 14 Jun. 20 Gallamuir, Cowie 17 Oct. 10 Drip Moss 3 Nov.

CHAFFINCH *Fringilla coelebs* (B, W)

BBS: recorded at 4.8 b/lkm. Large flocks in Dunblane area again.

- C Sixty Gartmorn Dam 21 Sep.
 S Dunblane: Dykedale: 950 on 24 Jan, 300 on 17 Feb, 950 on 25 Mar, 150 on 17 Apr, 155 on 15 Oct; Stonehill: 110 on 24 Jan, 750 on 13 Nov and 180 on 27 Nov; Ledcameroch: 65 on 20 Jan and 6 Feb, 80 on 27 Feb and 110 on 31 Mar. Elsewhere: ca. 200 Lots of Callander 24 Jan. 1 sang Viewforth, Stirling 4 Feb.

BRAMBLING *Fringilla montifringilla* (W)

A good year for the species.

- F Bo'ness, Liddle Drive: F 30 Nov and 7 Dec and 7 on 27 Dec. 1 Skinflats tidal exchange 16 Nov. 2 Airth 3 Dec. 2 Carronshore 5 Dec.
 C Two Dollar 1 Jan for about a week and a single there 7 Dec. 3 Alloa 10 Jan.
 S Dunblane: Sheriffmuir Rd - 2 on 1 Jan; Ledcameroch - singles 2 and 20 Jan, 2 on 6 Feb, 1 on 10 and 20 Feb, 2 on 27 Feb, 18 and 20 Mar, 1 on 23, 26 and 30 Mar, 4 on 31 Mar, 2 on 3 Apr, 1 on 5, 6 and 10 Apr and 1 on 5 and 11 Dec; Dykedale - 4+ on 24 Jan, 20 on 25 Mar; Holmehill: 1 on 6 Feb; Row: 1 on 14 Nov; Newton Crescent - 3 on 29 Nov, 20 and 28 Dec; Ochiltree - F on 4 and 9 Dec, M on 10, 22, 23 and 25 Dec; unspecified location - 3 on 20 and 6 on 22 Dec; centre - 1 on 30 Dec. BoA: Alexander Drive - 3 on 4 Jan; Keir Street - M on 21 Dec. Elsewhere: 1 Aberfoyle 17 Jan and 10 there 28 Nov. 1 Pencilles of Collymoon, Flanders Moss 10 Feb. 10 L Watston 17 Oct. 1 E Lake of Menteith 30 Oct. 1 Fallin 6 Dec. 1 Ashfield 30 Dec.

EUROPEAN GREENFINCH *Carduelis chloris* (B, W)

Under-recorded.

- F One hundred and twenty Skinflats lagoons 6 Aug.
 S Dunblane: 40 Kippenross cottages 19 Jan and 90 Dykedale 15 Oct. 10 King's Park, Stirling 26 Jan.

EUROPEAN GOLDFINCH *Carduelis carduelis* (B, W)

BBS: recorded at 1.0 b/lkm.

- F Skinflats tidal exchange: 20 on 2 Aug, 120 on 8 Sep and 80 on 19 Sep. 70 Powfoulis 19 Sep. 20 Kinneil 4 Sep and ca. 40 on 3 Oct.
- C Sixty-five Kennetpans 19 Sep.
- S Argaty, BoD: 32 on 1 Jan. Ca. 80 on thistle heads Borrowmeadow, Stirling 28 Aug. 37 Waterside, Kinbuck 20 Sep. 35 Stonehill, Dunblane 30 Sep. 30 Sheriffmuir Inn 30 Sep. 15 Airthrey, BoA 3 Nov with 30 there 16 Nov.

EURASIAN SISKIN *Carduelis spinus* (B, W)

- F Langlees woodland regeneration, Falkirk: 35 on 14 Nov and 15 there 19 Dec. 35 Airth 16 Nov.
- S Dunblane: Newton Crescent - 27 on 14 Jan, 170 on 24 Jan, 70 on 25 Jan, 90 on 25 Mar and 85 on 31 Dec; Scouring Burn - 50+ on 27 Feb; Ledcameroch - 15 on 27 Feb, 70 on 30 Mar, 50 on 31 Mar and 105 on 6 Apr. Ca.120 Cambusmore/Gart 24 Jan. 200 Carron Valley Res 13 Mar. 80 Corrie, L Ard Forest 20 Mar. 60 Bannockburn 1 Nov. 50 Fallin Bing 16 Nov. In breeding season: 2 Castleview, Stirling 29 May.

COMMON LINNET *Carduelis cannabina* (B, W)

- F Fifty Dunmore 5 Jan. 23 Skinflats tidal exchange 20 Jul and 45 there 2 Aug. 30 Kinneil 17 Oct. 60 Dunmore 21 Oct.
- S Dunblane: Stonehill - 50 on 18 Sep, 120 on 13 Nov, 380 on 27 Nov and 950 in seeded kale crop 25 Dec; Landrick - 70 on 20 Nov. Elsewhere: 51 Cardross Br, Flanders Moss 19 Sep. 140 Wester Cambushinnie 3 Nov.

TWITE *Carduelis flavirostris* (b, W)

- F One Dunmore 4 Jan. 1 Kinneil 11 Jan. 43 foreshore Airth 17 Jan. 15 Skinflats tidal exchange 14 Nov and 40 at lagoons 23 Nov. 14 Airth 16 Dec.
- S 15 Doune 15 Apr. 1 L Walton, Carron 11 Oct. Ca. 10 Stonehill, Dunblane 15 and 25 Dec.

LESSER REDPOLL *Carduelis cabaret* (b, W)

- F Kinneil: 20 on 11 Nov and ca. 150 on 20 Nov.
- S Ten Cromlix 29 Mar. BoA: Keir Street - 20+ on 7 Feb, 42 on 30 Mar; Airthrey - 15 on 3 Nov. Dunblane: 15 Newton Crescent 16 Oct and 19 Laighills 19 Oct. Breeding season: Ledcameroch, Dunblane; G Finglas Res; Carron Valley Res; G Balquhiddy; Dun Dubh Wood, Aberfoyle and Sheriffmuir.

COMMON REDPOLL *Carduelis flammea*

- F One Kinneil 20 Nov (DT).
- S One Ledcameroch, Dunblane 26 Mar. 2 Kenknock, G Lochay 12 Dec (CS, DOE). These are the 3rd to 5th records of this species in the recording area since 1974.

RED CROSSBILL (COMMON CROSSBILL) *Loxia curvirostra* (b, W)

- C Two Forestmill 28 Feb.
- S Ten Lanrick, Doune 10 Jan. L Ard Forest: 3 Torrie Forest 18 Jan with 25 Corrie 20 Mar. Carron Valley Res: 2 on 19 Jan, 2 prs 21 Feb, 16 on 13 Mar, 6 on 27 Apr, 80 on 2 May and 4 on 11 Oct. 5 Lossburn plantation, Dumyat 30 Jan. Ben Ledi: 6 Ardnandave Hill and 10 Stank Glen, both 11 Feb. 4 Cambusmore/Gart 12 Feb. Dunblane: 1 Dykehead 17 Feb and 2 M Whiteson Wood 17 Apr. 2 Cononish, Tyndrum 17 Feb. 25+ Drunkie Forest 7 Mar. 9 L Rusky 14 Mar. 20 Cromlix 29 Mar. 50 Drumloist 29 Mar. 6 Dykehead, Flanders Moss 16 Apr. 4 Sheriffmuir 17 Apr, 1 on 17 May and 3 on 20 Nov. 15 Ruskie feeding in larches and other conifers 4 May. 14 Bracklinn, Callander 17 Oct. 5 Ardcarnaig, L Doine 10 Nov. 18 G Lochay 12 Dec.

***COMMON ROSEFINCH** *Carpodacus erythrinus*

C One Pool of Muckhart 21 to 25 Jun (BRG).

This is the 7th record of this species in the recording area since 1974, the first having been recorded in 1997.

COMMON BULLFINCH *Pyrrhula pyrrhula* (B, W)

F Seven (2M, 2F, 2 immature M) Langlees, Falkirk 10 Oct. Breeding season: pr Dunmore Woods 24 Apr.

S Doune: 18 Lodge 3 Jan and 12 on 9 Jan. 14 King's Park, Stirling 26 Jan and 9 on 8 Feb. Dunblane: 2 ads feeding Y Rowan berries Ochiltree 3 Sep and 8 Ashfield 20 Oct. 8 Airthrey, BoA 11 Oct. 7 Gallamuir, Cowie 31 Oct. 16 G Lochay 12 Dec. Breeding season: 2 Keir St, BoA 2 Apr with juv there 21 Sep. 1 Castlevie, Stirling 13 Jun.

SNOW BUNTING *Plectrophenax nivalis* (W)

F One South Alloa 3 and 4 Jan. 1 on saltmarsh Airth 4 Nov.

C Sixty Craig Leith, Alva 4 Dec.

S Eighty Cononish, Tyndrum 17 Feb. 12 Stuc a' Chroin 21 Feb. 30 Twisten Hill 18 Apr.

YELLOWHAMMER *Emberiza citrinella* (B, W)

F Twelve Skinflats 2 Oct. Breeding season: Skinflats lagoons and tidal exchange and Falkirk stadium.

C Tullibody: 27 on 3 Feb with 24 at the Inch 8 Mar, 19 on 26 Nov and 36 on 12 Dec. Breeding season: Gartmorn Dam and Cambus Pools.

S Twenty Carse of Lecropt 8 Jan with 41 there 5 Mar. Dunblane: 41 Kippenross cottages 24 Jan, 55 Glenhead-Greenyards 9 Mar, 13 Craigarnhall 14 Nov. 29 Ashfield 30 Jan. Flanders Moss: 21 Pendicles of Collymoon 10 Feb with 45 Cardross Br 19 Sep. Breeding season: Cambuskenneth; Kippenross estate, Dunblane.

REED BUNTING *Emberiza schoeniclus* (B, W)

F Breeding season: Falkirk, Lionthorn and Stadium; Skinflats (ad carrying food 12 Jun).

C R Devon: 11 Alva-Tullibody Br 17 Jan, 32 on 21 Feb, 30 on 13 Mar, 18 on 14 Nov and 36 on 19 Dec. 29 Inch of Ferryton, Kennetpans 14 Feb. 40 Tullibody Inch 8 Mar with 23 there 12 Dec. 35 Blackdevon wetlands 26 Oct. Breeding season: Gartmorn Dam and R Devon at Alva.

S At least 15 Carse of Lecropt 10 Jan. 15 R Forth, Teith-Allan conf 10 Jan. 21 Glenhead-Greenyards, Dunblane 9 Mar. 13 Hilton Fm, Dykehead 6 Nov. Breeding season: Cocksburn Res, BoA; Keltie Water, Callander - Allt-na-Criche, Arivurichardich and reservoir; Castlevie, Stirling.

ESCAPED AND INTRODUCED SPECIES**WOOD DUCK** *Aix sponsa*

This is the 6th record (omitting multiple sightings of a long-staying bird in 2004-2006) of this species for the recording area. A male was present on the canal in Jan, Feb, Mar and Sep 2008 and in Nov 2009. It is probable this was the same returning bird. Only 4 different individuals have likely been involved altogether.

F M Greenbank, Union Canal 18 Mar and 30 Oct. M Summerford-Glen Village stretch of Union Canal, Polmont 27 Sep, 13 Oct and 18 Nov (RD, CM)

WHITE STORK *Ciconia ciconia*

This sighting constitutes the 7th record of escaped birds for the recording area - there are three records of assumed wild birds - but are all likely to refer to just one individual recorded at Blairdrummond from May to Dec 2008, in April and July 2009 at Blairdrummond and environs and in Falkirk.

S One Keir roundabout, Dunblane 7 Apr (NB).

RED-LEGGED PARTRIDGE *Alectoris rufa* (B, W)

Released on shooting estates, generally widespread but in small numbers.

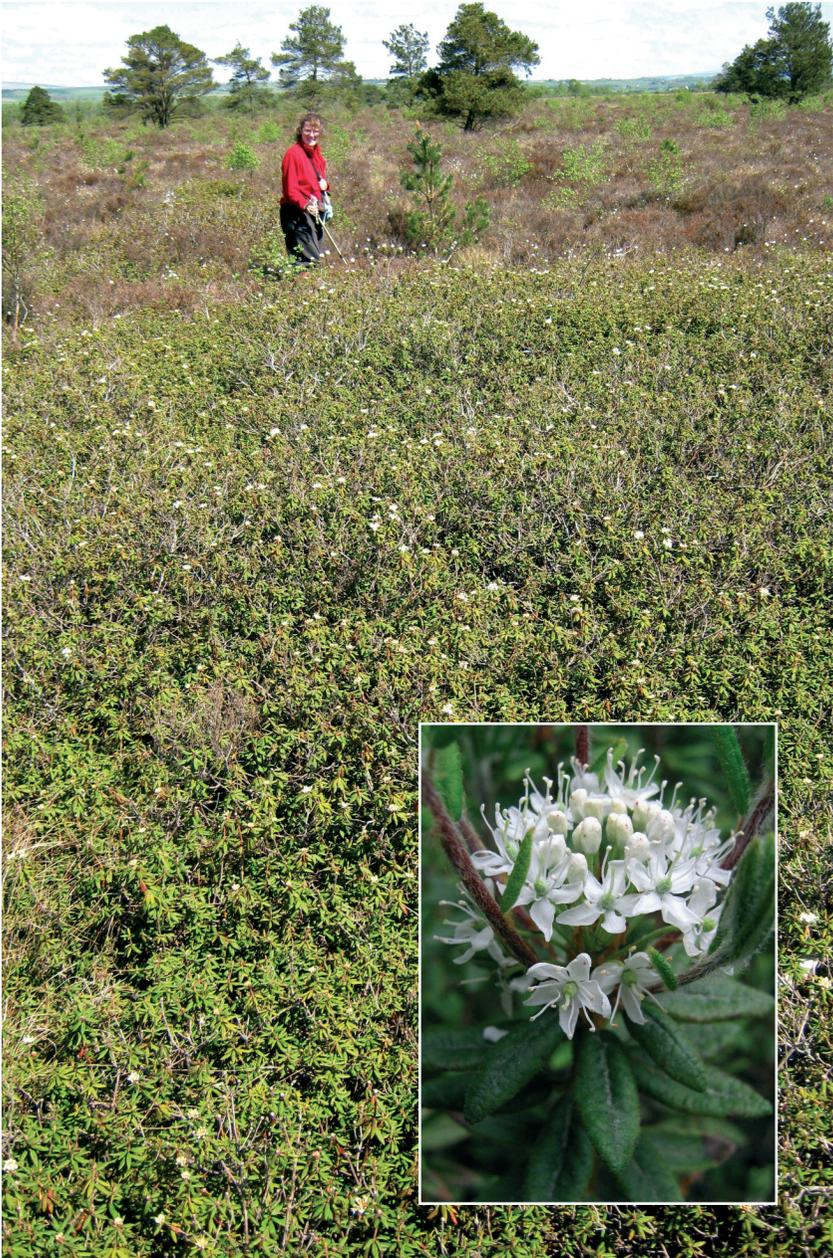


Plate 1. Part of the *Ledum* colony on Flanders Moss. The person is positioned to mark the far edge of a continuous mat of plants. The inset shows the terminal inflorescence.



Plate 2. Broad-leaved helleborine. Left: entire plant. Upper right: a single floret showing the pink labellum with the maroon cup shaped nectary. The opalescent glue sac or viscidium is surmounted by the yellow pollinia. Below right: a tree wasp retreating from a flower with pollinia attached to its forehead.

Plate 3. Some moth highlights recorded in the region in 2010.



Lilac Beauty (*Apeira syringia*)



Barred Carpet (*Perizoma taeniata*)



Red-necked Footman (*Atolmis rubricollis*)



Chamomile Shark (*Cucullia chamomillae*) larva



Pale Pinion (*Lithophane hepatica*)



Golden Twin-spot (*Chrysodeixes chalcites*)

All photographs by the author.



Plate 4. Above: Castle Court, built as army married-quarters in the 1870s and symptomatic of the contemporary army reforms. Below: The prison was built in the 1840s but was taken over by the army as the Military Prison in 1888. *Photographs by J. Harrison*



Plate A. The Dunblane Cathedral Museum.



Plate B. Southern external elevation after removal of extension.



Plate C. Northern external elevation of building.



Plate D. Decorated spindle whorl SF 32.



Plate E. Structure 1, ground floor, with shadow of staircase and blocked door in eastern elevation.



Plate F. Structure 1 ground floor, inserted doorway and blocked fireplace in western elevation.



Plate G. Structure 1, loft, chimney flues found in eastern gable.



Plate H. Left, post-medieval decorated body sherd SF 43 and medieval jug handle SF 55; top, modern stoneware ink bottle SF 30; right, rim of post-medieval bowl or skillet SF 5; front, modern tin-glazed earthenware with blue decoration SF 49.



Plate I. Dutch gin bottle SF 53.

THE ARCHAEOLOGY OF THE RENOVATION OF DUNBLANE CATHEDRAL MUSEUM

Beverley Ballin Smith, Alastair Becket, Gavin MacGregor, David Sneddon
and Bob Will

Introduction

In June and July 2008 and January 2009, Glasgow University Archaeological Research Division (GUARD) undertook archaeological monitoring of the renovation of the existing structures and the construction of a new annexe at Dunblane Cathedral Museum, The Cross, Dunblane. This work was carried out on behalf of Dunblane Cathedral Museum as a response to conditions placed upon planning consent granted by Stirling Council (S06/00553/LBC).

Dunblane Cathedral Museum (NGR NN 7820 0134), lies at the heart of the medieval burgh of Dunblane, opposite the Cathedral with the Allan Water approximately 100 m to the west. The museum buildings rest on glacial sands and gravels beneath which are sandstones (Geological map, Stirling Sheet 39, Drift and Solid). The site comprises the Dean's Manse and a series of terraced structures to the east, as well as an open area to the south that formerly accommodated an earlier extension to the museum that has now been demolished (Figure 1).

Archaeological Background

GUARD had previously undertaken an archaeological evaluation and monitoring of the work of site investigation in October 2007, in the form of three trial trenches and three test pits (Will and McLellan, 2007). A series of archaeological features and deposits were identified within the evaluation trenches and within one test pit. Notable deposits at the south-west corner of an extension built in the 1970s, included the remains of a stone-capped drain, areas of cobbling, and flooring located below the topsoil and a concrete slab. The features were only recorded and not excavated to allow a mitigation strategy to be developed.

The area surrounding Dunblane Cathedral Museum, including the area of the Cross and Kirk Street, contains a wealth of archaeological material and some of the oldest standing buildings in Dunblane particularly from the medieval period being the then focus of the medieval burgh. This area was the most heavily developed part of the town, being so close to the market place and, as a result, competition for space was at its most intense with much rebuilding of properties and the expansion and contraction of streets and property boundaries (Will, 2007).

The cathedral museum building (Plate A) was constructed on the Cross

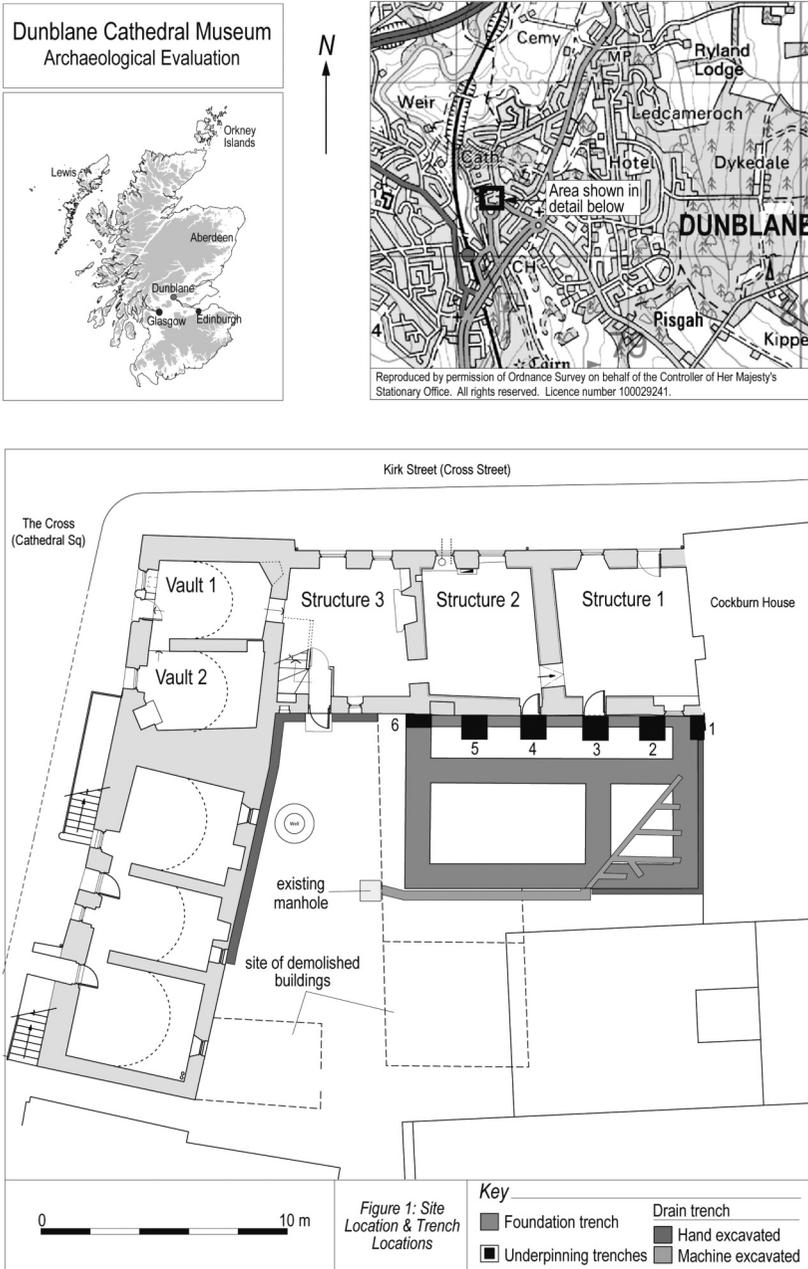


Figure 1. Site location and trench locations.

around 1624 as the Dean's Manse but there are few records available to indicate the previous usage of this site prior to this date (NMRS: NN70SE 15.06). However, the area of the annexe is known to have had a series of buildings on it over the last 150 years and the present day gardens were occupied by a 19th century weaving shop and stables.

Aims and Objectives

The aim of the watching brief was to provide archaeological supervision for the demolition works, to ensure that any disturbance of ground, services and the existing foundations did not result in the unrecorded removal of any archaeological deposits. It also covered monitoring the excavation of foundations for the new extension and its associated services in the courtyard and the pend through to High Street. Any new openings in the fabric of the existing building were also recorded.

Methodology

Renovations at the building involved ground disturbance works, both within and outside the buildings. All ground work was supervised by an archaeologist and excavations were undertaken either by hand or with a mechanical excavator. Archaeological features were cleaned, recorded, planned and photographed (full details of the site methodology are in the RCAHMS (Edinburgh) archive).

Owing to the number of alterations to internal and exterior spaces area codes were given to rooms and trenches (Figure 1). The terraced east wing was divided into three 'structures' (numbered 1 to 3) with an upper and lower room in each. The vaulted rooms located on the ground floor of the Dean's Manse were numbered 1 to 2. All exterior works associated with the construction of the new annexe were concentrated to the south of the east wing in the area of the former extension and within the communal garden area to the rear of the museum. A series of six trenches (UP 1-6) were excavated to under-pin the south wall of the eastern range where the new annexe joined the existing buildings.

Demolition of the 1970s extension and works within the buildings revealed several previously hidden architectural features, which were also recorded to archaeological standards. New openings in the fabric of the structures were also monitored and recorded including the creation of holes in walls to support roof steels and the replacing of rotten timber lintels. Concrete slabs forming the floors within structures 1, 2 and 3 were broken up and the floor levels reduced by c. 0.2 m. A stairway within the eastern range was also removed.

External Works (Plate B)

Work focused on the exterior of the museum, within the footprint of the

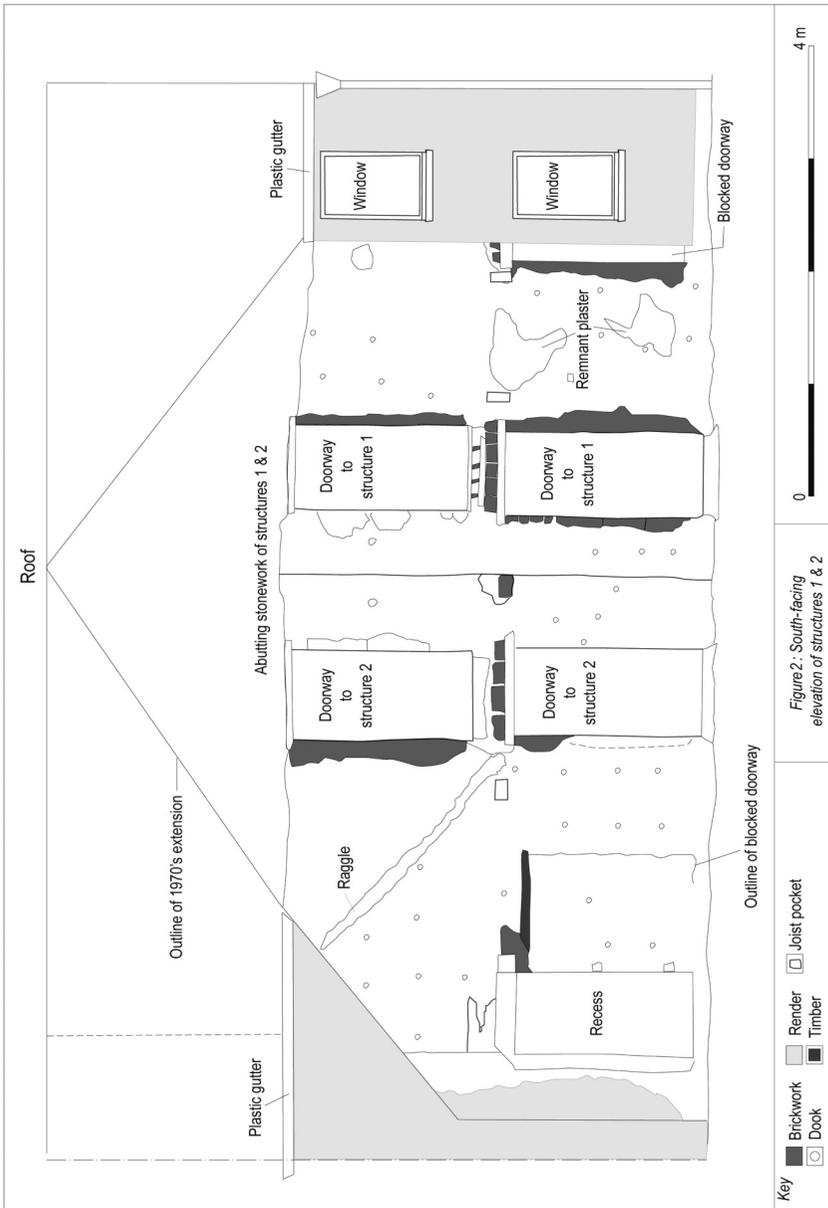


Figure 2. South-facing elevation of structures 1 and 2.

extension to the eastern range, where several archaeological deposits and features were encountered (see below). The exterior stonework of the building once exposed by the removal of the extension showed that the terrace comprised three separate abutting buildings (Figure 2). This configuration was confirmed by the northern elevation where there are clear differences in the construction of the windows (Plate C).

Four south-facing doorways in Structures 1 and 2 were all of recent origin, and had been knocked through the original walls of the building during the construction of the extension. Two blocked doorways and a recess that may have been a blocked doorway on the ground floor, also related to these structures. A raggle (evidence of a former roof alignment) within this wall and patches of horse-hair plaster plus the presence of many wooden dooks or plugs (remains of structural timbers in holes in walls), confirmed the locations of previous structures that adjoined the terrace.

The grubbing up of foundations of the demolished extension to the south of structures 1 to 3 did not result in any disturbance to archaeologically sensitive deposits. The foundations were of reinforced concrete, 0.35 m thick, dug into a c. 0.50 m thick deposit of mixed rubble and soil (001) which covered the entire area of the extension.

The first under-pinning trench (UP 1) was excavated in the north-east corner in the location of a test pit (Test Pit 1) excavated during the evaluation phase (Will and MacLellan, 2007). Both the digging of the test pitting and the construction of a large drainage pipe trench that runs southwards from the corner of the buildings, have significantly disturbed this area. In undisturbed areas, the mixed rubble (001) was 0.3 m thick and extended to the base of the foundations, below which was sandy subsoil (008).

In UP2, beneath the capping rubble (001) was a 0.2 m thick layer of grey-brown sandy-silt (002), which ran underneath the foundations of Structure 1. This material overlay the sandy subsoil (008).

Beneath the rubble (001) and sandy-silt (002) in UP 3 (Figure 3) was a dump of loose small stones and grey sandy-silt (003). Below was another layer of sandy-silt (004), up to 0.35 m thick, which covered a partly visible oval-shaped pit (006) cut into the subsoil (008). A mixed clay deposit, with lumps of burnt clay and the occasional small stone (005) filled the upper part of the pit. The lower part contained a thin layer of charcoal (007) beneath which its base and sides were discoloured by burning or scorching. This pit (006) was thought to be the earliest feature on the site. A sample from the charcoal was analysed by Susan Ramsay and both *Ericales* (heather type) and *Cytisus/Ulex* (broom/gorse) was identified. This suggests that, whatever the pit was used for, the fuel had been selected to provide a fast and intense heat (Gale and Cutler, 2000). A sample of *Cytisus/Ulex* charcoal produced a radiocarbon date of 1270-1400 AD (SUERC-32841 at 2 sigma – 95.4 % probability) indicating that it pre-dated the buildings on the site.

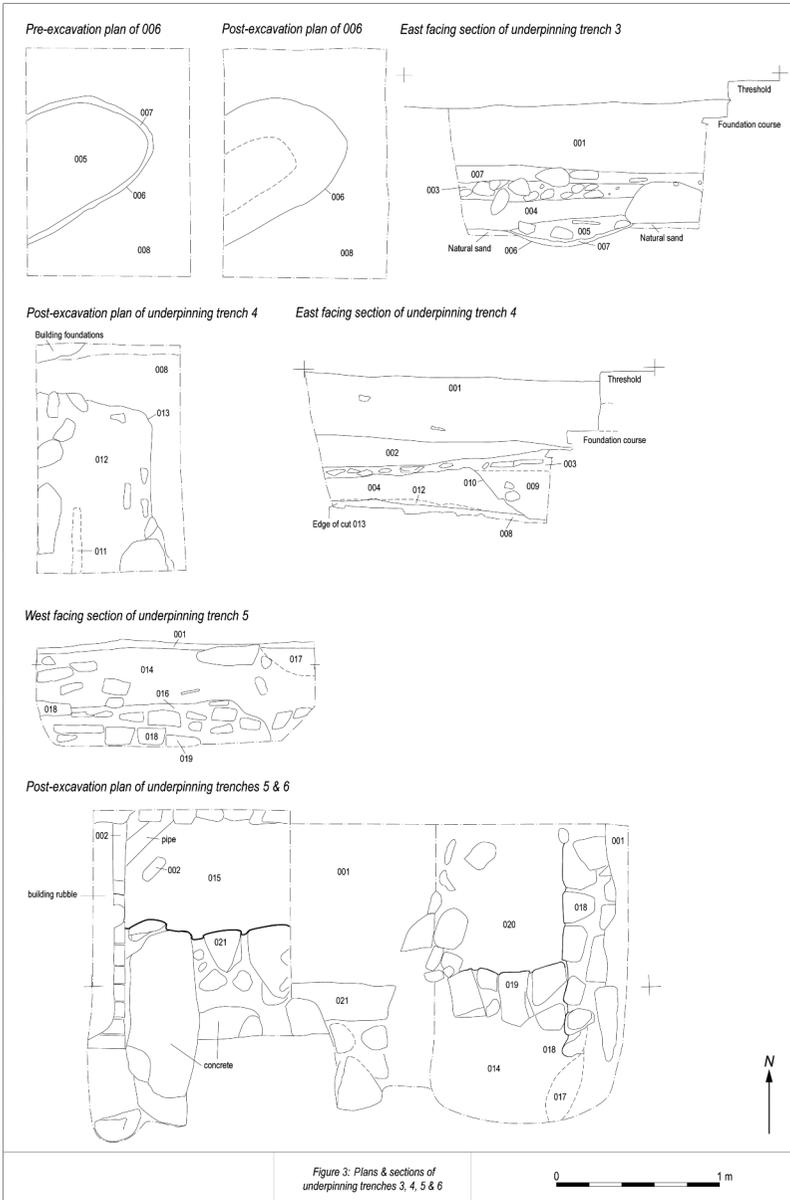


Figure 3: Plans & sections of underpinning trenches 3, 4, 5 & 6

Figure 3. Plans and sections of underpinning trenches 3, 4, 5 and 6.

UP 4 (Figure 3) contained the same overlying deposits, (001, 002 and 003) seen within UP 3, as well as a linear feature (010) that ran parallel to the foundations of Structure 2. This feature had been dug into the homogenous sandy deposit (004) seen in UP 3 and was filled with grey-brown silty-sand (009). A partially visible linear feature (013) aligned north/south filled the base of the trench. It was filled with silty-clay (012) and possibly lined with stones. A single large stone slab (011) was removed from the top of the fill and it may have been a capping stone. The linear feature (013), possibly a drain, was cut into subsoil (008).

A series of walls were discovered within UP 5 (Figure 3), in places only 0.2 m beneath the ground surface but sealed beneath rubble (001), a patch of modern builder's sand (017) and a deposit of yellow-brown silty-sand (014). Two adjoining stone walls, both mortar bonded, one aligned north/south (018) and the other east/west (019) appeared to correspond to the roof raggles and wooden dooks seen on the walls of Structures 1 and 2 (Figure 2). The area between the two walls and the wall of the building was filled with a yellowy-brown deposit of silt (020).

The final trench (UP 6) had been heavily disturbed at its western end by drainage pipes relating to the 1970s extension. It revealed a continuation of east/west wall (019/021) in UP5 with a brown sandy-silt and rubble deposit (015) between it and the existing wall.

Excavations required for the foundations of the new annexe included a general reduction in ground level of 0.3 m. This disturbed the mixed rubble (001) as well as the upper sections of the walls identified within UP 5 and UP 6. Several deeper trenches, around the perimeter of the site and in the location of the annexe's internal walls, cut through the rubble (001) and exposed the brown silty-sand (002) that had been identified in the under-pinning trenches. Several artefacts were recovered from the rubble (001) during this phase of excavation, including three intact glass bottles (SF 53 – a Dutch gin bottle stamped 'P. Loopuyt & Co. Distillers Schiedam'), several sherds of green glaze pottery (SF 29), and an intact brown glazed ceramic bottle (SF 30) (Plate H). The excavation of the foundation trenches required the partial removal of wall (018) identified in UP 5.

Several trenches were excavated at the south-eastern corner of the site to accommodate waste water pipes. As they were dug 0.2 m deeper than the foundation trenches they revealed the top of a possible sandstone wall running north/south in this area. A decorated spindle-whorl SF 32 was found within the mixed rubble (001) close to this wall (Plate D). The northern drainage channels were excavated though an area heavily disturbed by water and waste pipes from the 1970s extension and no archaeological features were encountered here.

A further series of narrow trenches, 0.3 to 0.5 m wide, were excavated to accommodate drainage pipes once the new building had been erected. These

generally ran parallel to the external walls (Figure 1) and did not contain anything of archaeological significance.

A machine excavated trench ran east/west, parallel to the southern end of the new building, to a maximum depth of 0.7 m from the ground level. The majority of the trench contained a mixture of brown silty-sand and rubble (001). At its eastern end, a concentration of large and small sandstone rubble fragments (024) and flatter stone fragments (023) were present in the base of the trench mixed with dark-brown sandy-silt and mortar (025), similar to (001). A fragment of modern glass (SF 35) and china (SF 34) were found on top of the rubble. Natural orange sand and gravel (008) was also located in the base of the trench and, although not clearly defined, sandstone rubble (024) and the darker sandy-silt (025) may have been contained within a linear feature running approximately north-east/south-west. However, this was not investigated further due to the limited width of the trench and the presence of a large sandstone boulder. The rubble concentration and possible linear feature could have been the remains of a robbed out wall.

Internal Works

The removal of plaster from several interior walls revealed evidence of previous alterations to the structures and in some cases provided an insight into earlier functions prior to their incorporation into the museum. Floor levels were reduced by a maximum of 0.2 m in all three structures but not within the vaults. These excavations showed that sandy material had been brought in to form their floor levels. Several sherds of glass (SF 1), an unidentified coin (SF 15) and green glaze pottery (SF 5) were found in this material.

Structure 1

On removal of plaster and plasterboard from the walls of the ground floor level of Structure 1, several layers of wallpaper SF 4 were found as well as a shadow of a staircase on the eastern wall that provided access to the upper floor (Plate E). The fire-escape in the north wall may have been the original doorway to the building. Other alterations noted included the bricking-up of a doorway in the eastern wall, the eastern end of the southern wall had been significantly rebuilt and modern windows had been inserted. The western wall contained areas of inserted brickwork around the doorway to Structure 2 and the blocking of a fireplace (Plate F).

The upper floor of Structure 1 was not stripped of plaster but four holes were excavated in the eastern and western walls within the loft space to Figure 4: East-facing & west-facing elevations of structure 3, ground floor accept new roof steelwork (Plate G). The holes in the eastern wall revealed dual chimney flues running up each side of the gable.

Structure 2

The details of construction and alteration in Structure 1 were not seen in

Structure 2 as plaster was not removed from its walls. It is unlikely that any of the doorways are original, although a blocked doorway identified in the southern exterior elevation of the structure may have been original. A small recess was noted in the north-western corner of the ground floor.

Structure 3

Plaster was stripped from all four walls within the ground floor and a stairway to the upper floor was removed from the western wall.

The ground floor doorway between Structures 2 and 3 had been knocked through the original wall. A doorway or window with a wooden lintel in the western wall of Structure 3 to Vault 1 had been blocked with stone (see below) (Figure 4). A second blocked doorway was noted in the southern wall, which had been replaced by the current doorway to the courtyard. The westernmost window in the street-frontage may have been the original front door of this structure. Brickwork at the western end of the southern wall suggests a large blocked area possibly relating to the stairway to the upper floor.

Little plaster was removed from the upper floor of this structure but the scar of a stairway to the loft space, a bricked up doorway and small blocked window in its west wall were identified. The removal of a cupboard in the north-eastern corner of the room showed that a doorway had been knocked through this wall between Structures 2 and 3 at some stage in the past. It created a hole in the side of the chimney breast rising from the fireplace in the room below.

Vaults

The eastern walls of Vaults 1 and 2 contained blocked doorways or windows, indicated by timber lintels. The blocking in Vault 1 was partly hidden behind the wall and the roof vaulting. The doorway between the two vaults was cut through the western end of the dividing. Fireplaces had been built into the corners of both rooms. The window recess in the western wall of Vault 2 may represent a blocked doorway.

Artefacts found during the building works.

The Pottery by Bob Will

This small assemblage of 69 sherds of pottery is a good indicator of what was pottery was available in Dunblane during the medieval to modern period (Table 1). Not surprisingly the medieval and post-medieval pottery from across the site is probably of local origin.

The medieval assemblage

The small assemblage consists of six sherds Scottish medieval redwares. In this instance the sherds date mainly to the late 14th or 15th century as they are generally thicker-walled and glazed suggesting that they are from jugs

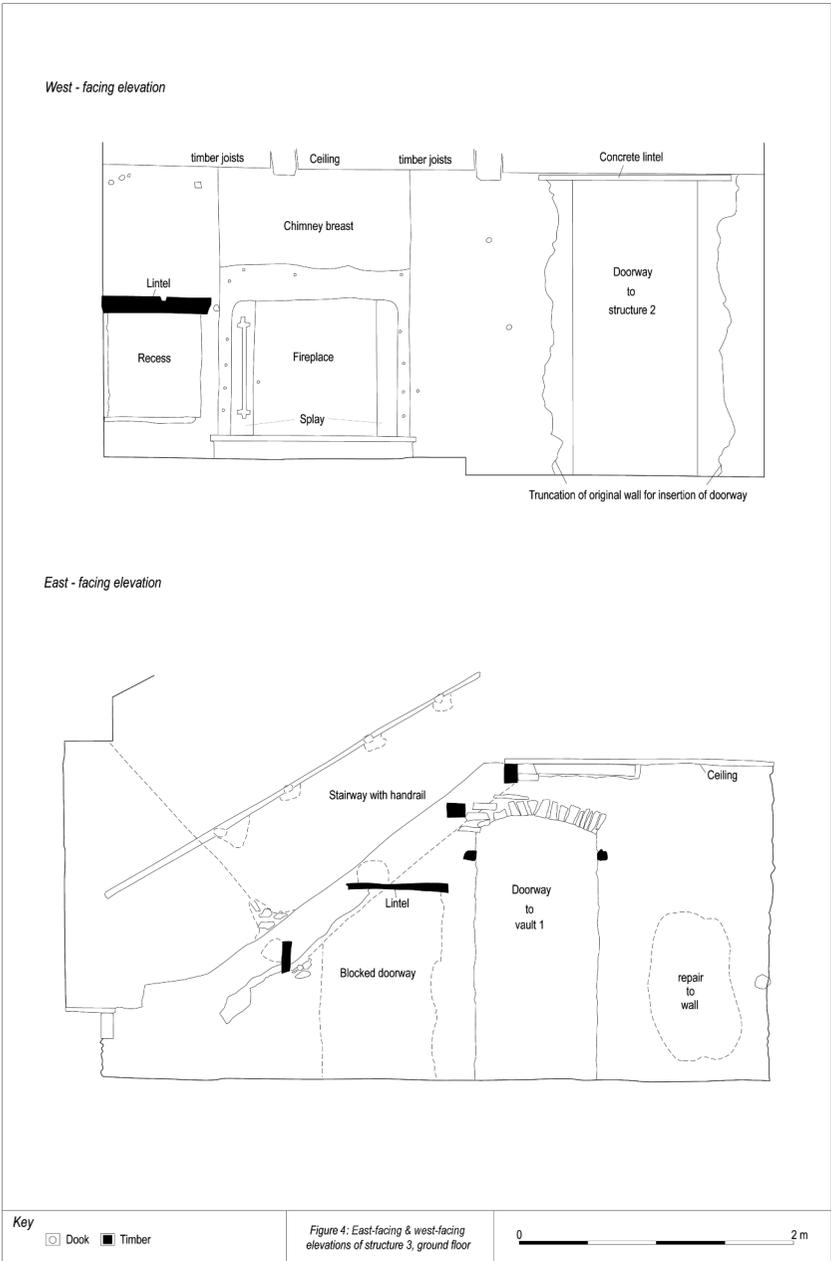


Figure 4. West-facing and east-facing elevations of structure 3, ground floor.

although a more finely made handle may be earlier (Plate H). The latter came from the foundations of the weaving shed in UP5. The term *Scottish Medieval Redware* is a general name to describe a group of similar fabrics found throughout Scotland. The largest assemblages of Scottish Medieval Redwares have been recovered from excavations in Aberdeen, Perth and other east coast burghs, which along with kiln sites at Rattray near Peterhead and Stenhouse near Falkirk have led to the use of the fabric name East Coast Redware (Hall, 1996). Generally these fabrics date from the 13th to the 15th century.

Post-medieval

Twenty-nine sherds from the post-medieval period (1500-1750) were recovered. Most of the sherds (27) belong to the fabric type *Scottish post-medieval reduced wares*. These are thick-walled with a grey to black fabric and thick green glaze. One sherd SF 43, context 18 from UP5 was decorated (Plate H). One of the first assemblages of this material to be studied was from Stirling Castle (Haggarty, 1980) and a kiln site is known from Throsk near Alloa on the Forth dated to c. 1617 to c. 1750 (Caldwell and Dean, 1992). Both sites are not far from Dunblane. Many of the sherds have split or fractured (spalds) and appear to be from bowls with out-turned rims possibly cooking pots or from jugs. One sherd, from the ground floor of Structure 2, also from a bowl or skillet, was recovered in a Scottish post-medieval oxidised fabric (Plate H). This reflects conditions in the kiln and these fabrics tend to be orange/red in colour and are often partially reduced rather than fully reduced. Another thin-walled and finely made sherd was recovered which may be an import but it was too small and partially burnt for a fuller identification.

Modern material

The modern material (1750 onwards) consists of a mixture of white earthenwares, red earthenwares, modern stoneware and a mixture of tiles and other utility wares. Amongst the white earthenwares was one sherd of tin-glazed earthenware with a blue hand – painted decoration which would date to the late 18th century and could be a product of the Delftfield factory in Glasgow (1748-1823) (Plate H). It came from the topsoil during the exterior works. There are also sherds of creamware and pearlware which again could be late 18th century although these wares continued to be made into the 19th century. The red earthenware sherds included brown glazed bowls with slip decoration and storage jars with black glaze.

A complete brown glazed industrial stoneware ink bottle with a spout was recovered from the topsoil of the exterior. It is stamped with the name of the French manufacturer *N Antoine & Fils, encre Japonaise* (Japanese ink) (Plate H) which would date to late 19th or early 20th century. While ink bottles are quite common this is the first instance known to the author of a French bottle being recovered from excavations in Scotland. Although the company was based in Paris they had outlets in other countries and cities including London.

Table 1: Breakdown of fabrics and sherds

<i>Fabric</i>	<i>Sherds No</i>	<i>Weight (g)</i>	<i>Comments</i>
Scottish Medieval Redwares	6	160	Mainly late 14th/15th century sherds from jugs but includes a ridge jug handle with an oval profile
Scottish Post-medieval reduced wares	27	422	Mainly from open bowls or skillets and jugs many of the sherds have cracked and split
Scottish post-medieval oxidised wares	1	36	Rim from a bowl or skillet, glazed on the interior
Post-medieval orange fabric	1	8	Finely made possible imported ware
Modern white earthenware	16	148	Includes tin glazed earthenware possibly Delftfield, creamware, pearlware and various forms of decoration including hand-painted and transfer printed
Modern red earthenwares	6	125	Includes slip decorated bowls and storage jars
Modern stoneware	1	308	Complete brown ink bottle from the French manufacturer <i>N Antoine & Fils, encre Japonaise</i> late 19th or early 20th century
Miscellaneous tiles etc	11	3320	Includes pan tiles, toilet fittings & chimney pots
<i>Total number sherds</i>	<i>69</i>	<i>4527</i>	

The Glass by Beverley Ballin Smith

A total of 40 sherds of glass were recovered from the excavations, mainly from the topsoil. All but three sherds are from bottles. The majority of the sherds (19), including one complete bottle, are from green wine bottles. Four sherds are from brown bottles and 14 sherds from clear/pale blue bottles, the majority are handmade. Of note is SF 46 from trench 2, context 18, which is the rim and neck of a pale green bottle of early 18th century date. SF 53 is a hand blown and moulded green gin bottle with *P. Loopuyt & Co. Distillers, Schiedam*, (of late 19th century probably c. 1890, see Maunsey, 2009) (Plate I) and SF 28 a small, square, hand-blown and moulded ink bottle in clear/pale blue glass (Plate H). Both the latter two finds came from the exterior topsoil. The three pieces of window glass came from the topsoil in UP 4. A clear ridged window glass is machine produced and modern in date.

The Stone Artefacts by Beverley Ballin Smith

Six stone artefacts were recovered from the site. Three are fragments of sandstone gravestones, with fragmentary lettering or numbering, and one piece is a perforated fragmentary roof slate. All are undated and mostly from

the topsoil. The following are noteworthy:

SF 32 from the topsoil is a fine-grained steatite/soapstone spindle whorl (Plate D) c. 42 mm in diameter decorated on both faces. It is pierced by a vertical but slightly off-centre hole, 11.1 mm diameter. One face has regularly distributed incisions radiating out from the perforation. The other face has 12 panels: half are plain and alternate with others which are decorated with horizontal lines. The edges of the whorl are smooth and slightly worn. Weight 34 g.

SF 8 from the topsoil of UP 4 is a small squared sandstone lamp hollowed on one face. The hollow measures 50 x 40 x 2 mm depth and was made by a fine chisel: marks are visible around its edge. The stone is possibly burnt and its base is flat with evidence of slight wear. Its sides have been chipped to shape but are not smoothed. It measures 74 x 67.5 x 41.5 and weighs 264 g.

Discussion

Since the construction of the Dean's Manse in 1624, Dunblane Cathedral Museum has undergone many phases of use including a series of alterations. A pit (006), possibly an expedient hearth located in UP 3, was excavated during the construction of the new annexe, and was dated to 1270 to 1400 AD. This single feature pre-dates not only Structures 1 to 3, but all other buildings on the site including the Dean's Manse. It is significant in that it suggests archaeological features relating to earlier periods of occupation survive beneath layers of overburden. The occurrence of medieval pottery on the site indicates contemporary uses and activities. These snapshots of evidence do not provide much of a story in themselves of what was happening in medieval Dunblane, but the potential to add to the information surviving below the foundations of the present-day buildings in the centre of the burgh is high.

A second unexcavated feature (013), a possible drain, was found in UP 4 at a similar depth to pit (006) and may be contemporary with it. It had been covered by redeposited subsoil (004), during levelling of the site prior to the construction of Structures 1-3. It is perhaps during this period of construction that the stone and silt layer (003) was deposited in the area of UP 3 and UP 4. Whether the feature within UP 4 pre-dates the Dean's manse is unclear.

The ground floor of the manse comprised a single large vault, with a front and rear entrance and windows. It was later subdivided into two separate vaults (Vaults 1 and 2), which had doors and windows to the west and possibly also to the east, and a corner fireplace in each. The most recent major alteration to the vaults involved the creation of the door- or passageway in the central vault wall between the two.

The original exterior wall of the Dean's Manse was partially revealed within Structure 3 where an east-facing window and a bricked up doorway were

noted (Figure 4). It is possible that evidence of a staircase seen in the western wall of the upper floor in Structure 3 related to this blocked doorway, which may have linked the two structures.

Structures 1-3, were built as three individual buildings of two rooms (ground and first floor) with loft space, and were accessed by stairs on their west walls. They formed a small terrace although the order of their construction is unclear. The southern exterior elevation and the interior elevations revealed during the course of works show that these structures have undergone significant changes over time. Each of the original three buildings was a simple two-roomed structure most likely occupied as a house. Blocked doorways in the southern walls of all three buildings may have been rear doors. It is unclear when these buildings were linked by doorways cut through their original walls, but it could be of fairly recent date.

The recess in the southern elevation may relate to a partially blocked doorway between Structure 2 and a weaving shed to the south. This structure was shown as a single rectangular structure on the first edition Ordnance Survey map of 1863-1864, and as a sub-divided structure on later maps until the creation of the museum annexe in the 1970s. The walls of this shed were identified through excavation and its roof as the raggle line noted on the exterior elevation of Structure 2. The discovery of a lamp (SF 8) and spindle whorl (SF 32) are further evidence that these buildings were for domestic occupation.

Another southern extension to Structure 1 was noted between 1900 and 1932, when it was shown on the 3rd Edn. Ordnance Survey map. It was demolished to make way for the construction of the annexe in the 1970s but it may explain the brickwork seen in the southern elevation of Structure 1 and the fragments of wall identified within the drainage trenches.

The construction of the 1970s extension to the museum was significant in both altering the internal layout of the original buildings as well as disturbing the archaeological deposits externally. The courtyard area was landscaped prior to the construction of the extension and material relating to the demolition of the weaving shed was mixed to form the deposit (001) that overlay the entire area. This material contained finds from a variety of periods and the inclusion of complete bottles suggests that the deposit had not been significantly disturbed since its deposition.

The watching brief at Dunblane Cathedral Museum offered an opportunity to investigate the archaeology of this significant location in the heart of Dunblane. Due to the nature of the development it was possible to mitigate any significant disturbance to this cultural resource. The potential for further and earlier archaeological remains, such as feature (013), was shown to be high.

Acknowledgements

Thanks go to the Dunblane Cathedral Museum for funding the work and especially to Janet Ainslie of the museum and Lorna Main, formerly of Stirling Council Archaeology Service for their input and assistance. Fieldwork was undertaken by Bob Will, Christine Rennie, Dave Sneddon and Alastair Becket. Susan Ramsay provided the botanical identification, illustrations were produced by Gillian McSwan and Caitlin Evans, and technical support was provided by Aileen Maule and John Kylie. Fieldwork was managed by Gavin MacGregor and the post-excavation by Beverley Ballin Smith.

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STIRLING CASTLE, THE ARMY AND THE TOWN C.1640-C.1900

John G Harrison

In a paper in this journal in 2007 I identified four phases of the relationship between Stirling Castle and the town;

The royal period to 1603

A brief lull between 1603 and the 1640s

The military period from the 1640s to the 1960s

The tourist period, of growing importance from the 1790s, overlapping with the military phase and continuing until the present day.

This paper will consider the military period to about 1900 and particularly to c.1750¹.

Of course, the 1640s was not the beginning of Stirling's relationship with military matters. Apart from the impact of battles, such as Stirling Bridge, Bannockburn and Sauchieburn, Stirling Castle was repeatedly besieged in the 14th century and the town itself recurrently raided in the 16th. But these were brief events, often at long intervals. Between 1300 and 1600 many of Stirling's inhabitants lived out their lives without hearing the clash of swords or having to take shelter from enemy gunfire; for others, their only experience of military matters might be a little training at the annual military display and weapons inspection (the wappenshaw) or a brief participation in a Border foray. From time to time, the retinues of visiting nobles clashed in the streets; for example, in 1577 the followers of Argyll and the Chancellor Glamis disputed for precedence in the street and Glamis was killed². The castle garrison was small, sometimes only the personal bodyguard of the monarch or the sort of guard set on the infant Mary queen of Scots to protect against kidnap. The permanent staff in 1561 were listed as the constable, keepers, porters, watchmen, garitours [watchers on the wall-heads], gardeners and 'other office-men' and when the keeper, the Earl of Mar, died in 1572 he owed the watchman, porter and gardener of Stirling £31 10s Scots and the 'suddartis' [soldiers] £80 as costs for the Whit term, sums which are inadequate for a large garrison³.

The Rough Wooings of the 1540s, when the town and castle were provided with new and more modern defences and the castle more fully garrisoned, prefigure changes to come a century later. For several years the military presence must have been obvious and more or less continuous, fading as peace returned and terminating abruptly with the removal of the French forces in 1560. This garrisoning was the result of sustained French finance to counter English attacks and influence⁴. Similarly, the decisive factor which was going to

change Stirling's experience of the military from the 1640s was sustained finance from taxation and the consequent raising and maintenance of a standing army in Scotland for the first time. It was money which made the army a daily fact of life for Stirling's inhabitants for over 300 years, until the garrison left the castle in the 1960s.

Of course, there would be further battles. The town of Stirling capitulated without a fight to General Monk in 1651, the castle putting up only a brief resistance. The town quickly capitulated to the Jacobites in January 1746, though on that occasion the castle resisted successfully. But, again, these were brief events, however alarming for those involved. What I want to consider here, in some more detail, is the impact of the sustained presence of substantial numbers of soldiers, over many years, both in peacetime and in war.

In Scotland the immediate reason for creating a standing army was the wars which began in the late 1630s and continued to 1651 (The Bishops' Wars, Wars of the Covenant, War of the Three Kingdoms). But a standing army was also part of a wider European pattern of military professionalisation with consequent rising taxation and fiscal reorganisation. So, the return of peace did not result in the discharge of the armies nor in the termination of the taxes initially levied to pay for them.

These taxes (directly or indirectly) affected all Scots. It is ironic that wars which had their origins partly in resentment at Charles I's attempts to raise revenue in novel ways and without parliamentary authority were countered by a level and variety of taxes which exceeded the king's wildest dreams. The excise provoked particular resentment. 'Take that excise and God's vengeance be with it' said Alexander Rid to Alexander Home, the collector in September 1658. And a week later, Isobel Marshall paid her excise and bade the devil go with it, saying Home would 'get Hell for hinder-end for collecting it'. In 1721 Helen Jack said that if she had the excise officer at the door she would wash her hands in his heart's blood⁵.

Stirling, in contrast to other areas, gained some benefit from this money; not only did the soldiers spend at least some of their pay locally but there was also some government investment in military building in the castle and the area and investment in military roads in the 18th century benefited the town's trade. There was also something to be gained from supplying goods and services for the soldiers and for the army. But there were also costs, difficulties and tensions and Stirling's relationship with the army was often fraught. It is these problems which dominate the records.

A good example came in April 1645, when the town had been full of soldiers for a year, Katherine Livingstone cursed all the magistrates and (in the words of the session) 'wished both sword and pestilence to come in and devour us'⁶ Like others, she chose carefully, praying for the fulfilment of their worst fears, recognising that the dangers of a substantial military presence extended far

beyond war itself.

The late 1630s had seen the first waves of the coming storm. A regular garrison in Stirling dates from 1644⁷, however, the garrison (men whose base was the castle for a more or less extended period) were far from the whole story. Troops, regiments and whole armies were still posted to the town and vicinity for shorter periods, particularly in times of crisis. In addition, during the 18th century, as Stirling's military significance faded and the numbers of veterans rose following Britain's many foreign wars, substantial numbers of invalids and pensioners were based in Stirling or 'retired' to the town. From time to time, too, units of militia and yeomanry were raised, mainly for local service whilst press gangs were another manifestation of a society with a huge demand for military personnel.

The nominal complement of Stirling Castle garrison in the late 17th century was a captain or depute governor, two lieutenants, an ensign, three sergeants, four corporals, two drummers, three gunners and 100 men; their pay and coal allowance accounted for £1426 of the annual Scots army budget of £54,418, only slightly less than Edinburgh Castle's £1666 but a fraction of the cost of a regiment⁸. The muster rolls, however, show considerable variation in the real numbers with from two to four sergeants, one to three gunners, up to six corporals, various drummers and servitors and from around 75 to 150 men whilst the Collectors of Excise estimated as many as 200 men in 1710⁹. The earls of Mar were hereditary commanders until forfeited following the 1715 rising but day to day command was by an experienced officer and in the 1690s to early 1700s this was Colonel John Erskine (a relative of Mar's and the 'captain' in the summary above). The captain, lieutenant and ensign were 'gentlemen'. Long-serving garrison soldiers often had their own homes in the town, some were married and even had their own businesses in addition to their military duties. At the most senior level Colonel John Erskine was the town's commissioner to the Scots parliament which passed the Act of Union in 1706 and was later the first MP for Stirling Burghs in the Westminster parliament. He (or sometimes his deputy, also Colonel. John Erskine) were actively involved with many of the committees which provided 'county government' in Stirlingshire, ensuring that they were well informed about people and events¹⁰.

Sergeant William Pollock had been appointed Master Gunner in the castle in 1681 and appears in the Muster Lists. He occupied a substantial five hearths in Provost Kennedy's house in 1691¹¹. In June 1693 he appeared before a joint bench of burgh magistrates and Colonel Erskine to face a charge that, when the boots he had left for repair were not ready when required, he went to the shoemaker's house, brandishing a sword, a hand grenade and a lighted match as encouragement to speeding up the work! Far from resulting in severe action against Pollock, the case was allowed to lapse and probably quietly 'buried' by the army. Pollock had injured nobody and he was a valuable man whilst the shoemaker involved, John Lyon, was already a very doubtful character who

was later found guilty of selling grain in short measure and at high prices during a famine and in 1701 was rejected as Deacon of the Shoemakers since he was a person of 'the very worst reputation'. But the case illustrates a recurrent difficulty for the civic authorities as soldiers sometimes claimed exemption from any civil jurisdiction, often for faults which the army had no interest in pursuing or they fled from the jurisdiction of the town into the castle where the magistrates could not seize them. Pollock became a burges in 1702; he (and his son, also William) were both dead by 1712¹².

An earlier master gunner in the castle, James Gairdner, was actually the son of a Stirling merchant and was himself admitted burges and guild-brother in 1672; clearly, the army could present a career opportunity for local men without necessarily removing them from their roots. John Ronald, soldier in the castle, does not seem to have had family connections but thought it worth his while to spend £24 Scots to enter as a much more humble burges and neighbour in 1690¹³. Burgessry offered significant advantages, not least access to the town's various charitable funds – a consideration for soldiers who did not earn a lot and few of whom would get an army pension. Alexander Craw, corporal in the castle, had confessed fornication with Margaret Speedie in 1666; he was admitted as a burges and guild-brother *gratis* in 1669 when described as 'sergeant in the Earl of Mar's company'. In July 1697, on the recommendation of the Earl of Marchmont, he became a pensioner of Cowane's Hospital, a benefit he enjoyed till his death in 1706. Craw prefigures the increasing numbers of army pensioners and invalids during the 18th century which will be discussed below.

Neil Glass appears as a soldier in a list of 1692 and thereafter. He also lived in town, and in 1699 faced a case before the kirk session for tending the trees in his garden on the Sabbath. In 1698 when the Stirlingshire Justices of the Peace were examining some Highlanders suspected of theft, they called on Neil Glass to question John Gray for them as Gray spoke only Gaelic. In 1704 Neil Glass became a burges and in the same year was in a furious row about a garden in the town which he had rented from the laird of Glassingall. In 1724 £3 Scots was given to Euphan Jack, widow of Neil Glass, gardener, burges on account of her young child's needs¹⁴. Glass was clearly a bilingual Highlander, a migrant whose gardening activities seem the perfect symbol of his integration into the urban community whilst retaining his army links.

Glass's biography points to another source of recurrent tension, however. Whilst army units were often recruited by their commanders in their own localities, the army as a whole was ethnically diverse with Highland and Lowland, English and Irish units all found in Stirling from time to time. Early-modern Stirling, regardless of the army presence, bristled with ethnic tensions. Insults such as 'Highland slut' were widespread. In the early 18th century 'Irish' insults start to appear. Highlanders, mainly women, were the 'immigrants' of the 17th century and resentment was exacerbated by underlying fears of another culture which can only have been exacerbated by

the language barrier. When Robert Turnbull, minister of Alloa, visited Aberfoyle on the Highland margins in the 1690s, he was astonished that the 'barbarous and disaffected' [disloyal] local people were actually very kind. Stereotypical fears of clannish and violent Highlanders were also widespread. Adam Johnstone said that Kenneth McIntosh (a Highlander) meant to send into the north for his friends and relatives to assassinate him.¹⁵

Ethnic insults are usually recorded as used by local people about poorer and less powerful incomers. But army officers often regarded the locals with equal contempt. So, in 1751 Lieutenant George Nicolson called the well-to-do merchant Andrew Wallace a Scotch bugger, a rascal and a scoundrel. Nicolson's superior officers had to give a bond for his future good behaviour¹⁶. English officers posted to Scotland were all too inclined to assume that all Scots were 'rebels'. In 1760 some drunken English officers assaulted a toll-bar keeper in the Lothians, one saying 'God damn him for a Scotch rebel bugger'. Local landowners combined to ensure that the officers were prosecuted. Recognising that these incidents, minor in themselves, were symptomatic of a deep threat to the creation of a new British identity, George III intervened personally to ensure that these officers were severely dealt with¹⁷. Similar tensions during the English Cromwellian occupation in the 1650s boiled over as the Cromwellian regime collapsed and Charles II was restored in 1660¹⁸. When Margaret Nuckall, wife of an English soldier, was involved in a dispute with a neighbour in 1657, she was subjected to the horrific branks or 'scolds' bridle' and she was banished from the town as the English garrison left¹⁹.

The problems were much worse when large numbers of soldiers were involved. In September and October 1644, the kirk session was unable to meet on account of the 'troubles' and the visitors (who checked for breaches of the Sabbath) were unable to make their rounds 'because of the multitude of soldiers in this town'²⁰. The 2747 foot soldiers allegedly quartered within the town and its immediate surroundings for 18 days in 1648 must have at least doubled its population – and there would have been some cavalry as well²¹. It was claimed that McKay's regiment of 1200 men were in and about the town throughout the winter of 1689-90²². In the late 17th century the full complement of Buchan's regiment of foot was a colonel, a lieutenant colonel, two majors, a quarter master, a drummer and a surgeon and surgeon's mate; there were 11 companies, each with a captain, lieutenant, ensign, two sergeants, three corporals, two drummers and 57 privates; and in addition there was a troop of grenadiers with a similar range of NCOs and privates giving a total of over 800. Cavalry units were smaller but with proportionately far more horses. Regiments of that size might be in the locality for days, for weeks or for months and, as one moved on, might be replaced by another.

The space within the castle was inadequate even for a single regiment and whilst some men might be dispersed for some miles around, garrisoning minor strengths or watching strategic fords and bridges, others would have to either camp out in the Kings Park or elsewhere in the immediate locality of the town

or be put into quarters within the town itself. Even those in camp would, of course, drift into town looking for warmth, company and entertainment and often enough either finding, or creating trouble, too.

Few issues created more problems than quartering. Almost anyone could find themselves with soldiers billeted in their house but people in arrears with taxes and known political or religious dissidents were at particular risk. In theory, the soldiers' wages included an element to pay for their quarters but pay was often in arrears or paid only in part, so the 'hosts' had little option but to accept promises and bonds in lieu of hard cash²³. Again and again, the town had to approach government for back-payments for regiments which were long-vanished and even then the payments were often slow or incomplete. They also repeatedly petitioned for the burden of quartering to be reduced, for example by moving quartered soldiers into the castle. From at least 1653 the council regularly appointed quartermasters to allocate accommodation within the town²⁴. The system used may have been adapted from that formerly used for allocating quarters for servants, visitors and courtiers when the royal court was in town.²⁵ The quartermasters were paid a salary (and some served for extended periods) but it was a considerable task, often beset by confusion and delay and there were many complaints against them. Andrew Cowane said to Thomas Miller that the Devil made quartermasters, whilst James Burn went to the magistrates to complain of the soldiers quartered on him, saying that the magistrates did not just authorise the soldiers but authorised them to oppress him, intending, so he thought, to so far provoke him that they might justify fining him again, as they had done the previous year. Soldiers who objected to their host's political or religious views must have been difficult company²⁶.

Still, some people were happy to let rooms to soldiers, perhaps making some cash from spare space. Indeed, from time to time the council expressed concern that 'the wrong sort of people' were doing just that and concern about quartering was often mixed with concern about strangers and incomers who tried to lease rooms to the army. In 1742 the magistrates thought that poor Highlanders set up 'victualling houses for soldiers' as a cover for idleness and theft. Some of these were 'very bad houses' –they presumably meant that they were brothels. From time to time they tried to prevent all but burgesses or their widows from leasing accommodation but it was clearly an uphill struggle²⁷.

When the army had insufficient baggage horses and carts (as was often the case for major movements) they could simply commandeer what was required, sometimes forcing the owners to accompany them to remote places. Recovering even the nominal hire charges could be problematic and, if the horses or carts were lost, the problems were even greater. This, of course, bore particularly hard on carters and at times special schemes to compensate them had to be dreamed up by the burgh council²⁸.

Another struggle was to regulate the business activities of the castle soldiers. Within the burgh the burgesses' monopoly of many sorts of trade was enforced

by the magistrates. But, as with criminal matters, the castle was not within the magistrates' jurisdiction whilst the chief officers could often overawe the magistrates. The burgh tried many and various approaches to the problem. In 1652 Lt. Colonel Peter Pick, depute governor, was admitted as a burgess and maltman gratis but, unusually, with the full rights to make and brew malt he would have had if he had paid. In 1702 the town waived the fee due by Colonel John Erskine for his entry as merchant and guild-brother but, on that occasion, it was intended as a compliment to a local and well-connected gentleman; they were furious when he later started to trade in the town as an actual merchant. The upshot was that in 1705 Erskine paid the full entry dues. At a humbler social level, in 1670 Alexander Stewart, sergeant in the castle, was arraigned before the Guildry for retailing large quantities of tobacco imported from London and was forced to undertake not to do so for the future – though they could not prevent him retailing it to the garrison within the castle itself. Such incidents were not uncommon²⁹. In 1693, the Lieutenant Governor of the castle, none other than Colonel John Erskine, took a lease of the subtlary of the castle, with its brewing and other equipment for 12,000 merks Scots per year, a huge sum which surely made this the biggest single business in Stirling. An estimate of 1710 was that six Scots pints of ale were brewed for each man per week³⁰. Clearly, these military businesses were in direct competition with those in the town, reducing the economic benefits which might otherwise have countered the social costs.

Successive burgh councils entertained the governors and a range of visiting military officers to parties with copious drinks and sweets, hoping, doubtless to smooth relations but, given the town's strategic significance, the officers had a duty to keep an eye on political sentiment and activity. That could lead to tensions too. On 31 August 1654 it was the governor of the castle who oversaw the election of the town's member to the Commonwealth Westminster parliament. In November 1655 Captain Colster insisted that the Council of State's orders about the installation of a new minister should be obeyed and it was English officers (again acting on instructions from government) who insisted that the two rival claimants to fill Stirling's chief pulpit should both be recognised and paid by the town – with the upshot that the kirk was physically divided by a wall³¹. Whilst the oversight was particularly obvious during the English occupation, it was always a factor and became a matter of acute concern again in 1689 with the emergence of the new government of William and Mary and the re-imposition of Presbyterianism. Whilst this was welcome news to many there was a strong undertow of support for the exiled King James, particularly amongst local landowners and Episcopalians. Almost the first act of the new authorities was to rush troops to 'that disaffected town' of Stirling. In July 1689 the Earl of Crawford refused to grant more liberty to the Earl of Perth, who was a prisoner in the castle. This was not 'inhuman barbarity' he said but common prudence as Perth had abused similar privileges before and 'considering the disaffectedness of the town of Stirling to the present government and ... the circumstances of the castle and its significance to the nation' it was essential that the earl did not escape. In similar vein, a month later,

the Earl of Kenmure expressed concern for the safety of his troops in 'that disaffected town of Stirling'³². In 1710, Colonel Erskine was reporting that local Jacobites were talking of revolution.³³ Political oversight is seen very clearly in 1706 when there was a riot at the Mercat Cross and the Articles of the Treaty of Union were burnt in a public display of defiance by a crowd whom the council dismissed as a rabble of insignificant drunks and boys but who the garrison reported to the higher authorities were, in some cases, senior burgesses and people of influence³⁴. In the most extreme case, in January 1746, the Jacobite army threatened to sack the town if it put up any significant resistance and the magistrates (very sensibly and in spite of some grumbles from men such as Rev. Ebenezer Erskine) capitulated. The castle, much better defended, held out until the Jacobites retreated but the magistrates had to vigorously defend themselves against charges of pusillanimity – or even complicity.

Nor were the ordinary soldiers necessarily indifferent to the political and religious issues of the day. In 1689 the Presbyterians of Stirling asked the Privy Council to support their use of the vacant half of the kirk since, with the soldiers of Kenmure's regiment, presently stationed in the town, they were now very numerous. In the same year, soldiers of Angus's regiment (who included some ferociously Presbyterian Cameronians) disrupted the Episcopalian services in the church, threatening the precentor and the minister³⁵.

The most professional soldiers were the NCOs and men like the gunner William Pollock, who were appointed on merit. Officers simply bought their commissions – and being a moneyed 'gentleman' was no guarantee of efficiency or honesty. But it was the recruitment of 'other ranks' which had the greatest potential to cause problems, indeed, almost guaranteed that the arrival of the British army would be as much dreaded as the arrival of 'the enemy'. Some were volunteers, of course, though all too often these were 'men with a past' – or who realised that they had no other future. Others were pressured into volunteering when their local parish was ordered to find a specified number of recruits or to pay an equivalent sum; single men, the unemployed, the unpopular and the despised probably had little choice in the matter. Prisoners and vagrants might have even less choice as there was a bounty for the gaolers who delivered them for service as well as for the officers who actually recruited them, inducements which surely guaranteed oppressive measures³⁶. Particular groups might be protected from recruitment and in 1689 the Scots parliament passed a special act, protecting the apprentices working in Robert Gibb's cloth manufactory in Stirling³⁷. 'Joining up' even in the militia (a short-term force for local service) was unpopular enough for the town to reward those who served for any length of time with free burgessry from the 1660s so widening the scope of burgessry itself and fundamentally changing its character³⁸.

Then there were the press gangs, a particular plague in the Stirling area in the early years of the 18th century. In May 1702 a press gang commanded by

Major William Campbell swept through the town's Castlehill area. According to the evidence before the burgh court, when Captain Sharp threatened Patrick McFarland with a pistol, Mareon McFarlane, (wife of the soldier, Neil Glass already mentioned) gripped the pistol and told Sharp that he would 'shoot none at that time' and struggled with the major himself. At least four other women joined in the disturbance whilst Anna Stewart denied having been present but assured the court that 'if she had gotten notice sooner, she would have been'³⁹.

This event, the 'Women's Riot' was a classic urban disturbance. Like other riots it was a protest against the breaking of traditional norms and, as so often with riots against high grain prices, it is women who lead. They would be driven not just by a sense of what was right but also by the realisation that, if the men were 'pressed' they and other women would be left without a breadwinner in a difficult world. Whilst the Stirling women were only fined, no riot was risk-free and it was not unknown for soldiers to open fire on 'mobs' who threatened them⁴⁰. Perhaps men sometimes encouraged women to riot, hoping that they would be treated more leniently than men by the authorities. In this case, indeed, the magistrates were probably not unsympathetic to the rioters and just 10 days before had proclaimed an Act for protecting people coming to the town on business against being pressed – knowing full well that active press gangs were not good for business in a small market town. In the same year, the Privy Council had ordered the liberation of three men who had been pressed in or near the town⁴¹. In a particularly egregious case, in April 1696 a 'sufficient man' had been picked on to serve as part of the quota for St Ninians parish and (indicative of his enthusiasm) had been imprisoned in the house of Carnock till delivered. But Ensign Graham, finding him there, carried him off by force, facing the locality with the need to either find or pay for another man⁴².

Desertion was common – and would have been worse, no doubt, if pay had been kept up to date rather than being constantly in arrears. Ironically, then, one of the most dangerous times for the town was when a regiment or troop was disbanded. When Douglas's Regiment were disbanded in December 1697 they rioted, fired on their own officers, refused to lay down their arms and threatened to plunder the town unless they were paid 14 days subsistence. In the short term, Colonel Erskine was ordered to isolate Stirling and keep the 'disaffected' from the bridge, the problem partly resolved when the soldiers were given 1 week's pay. A month later, however, Douglas himself admitted that many of the men were still in penury and could not afford to attend the Privy Council in Edinburgh, even if summoned⁴³. Indeed, the town council had, quite frequently, to lend money to commanding officers to prevent just such outbreaks of violence and plunder and then to spend long months trying to recoup the cash⁴⁴.

Given that so many were unwilling recruits, that many had had problems, even in civilian life, that almost all were removed from the constraints of life in

their own families and communities, soldiers tended to be a rough, tough lot. All were exposed to the stresses and savagery of military discipline, often to the trauma of actual warfare. It was of an army like this that Wellington is reputed to have said 'I don't know what effect they will have upon the enemy, but, by God, they terrify me', an analysis which must often have been shared by the inhabitants of Stirling.

For, inevitably, the soldiers did not just impact on the town's institutions but on every resident, customer and visitor and it is the problems of these personal interactions which are recorded in the burgh court books and the kirk session minutes, many of the incidents involving women. On 18 December 1656 Elspeth Stewart admitted that a soldier had been in her house on the Sabbath day, though she had denied it when first questioned. It was all quite innocent, she explained, as she washed clothes for soldiers and the man had come for some linen. This was not a sufficient explanation for the session and Stewart had to sit on the stool of repentance, facing her with the dilemma, for the future, of starving or repeating the 'offence'⁴⁵.

The church and civil authorities general concern with the potential for fornication or adultery between unsupervised couples was all the greater where soldiers were involved since the man could have vanished before any pregnancy was known, making it almost impossible to either punish him or recover any costs for the child's upbringing. In 1711 the council determined to put any woman who did not report her 'uncleanness' with a soldier before he left the area on the cockstool and then to banish her⁴⁶. From 1665 to 1674 the Kirk Session dealt with around 82 accusations of fornication and adultery and in around 25 cases a soldier was named as the father. The figures can be only the roughest of guides – for example, there can be little doubt that, on occasions, the real fathers persuaded women to blame a soldier. But there seems little doubt that soldiers did father a significant percentage of the illegitimate children, probably more at times of real crisis. The women's relationships with the soldiers must have been extremely diverse but the public perception is, perhaps, encapsulated by the exchange in the burgh court, when Janet Forman was asked what she meant by calling Janet Wingate an adulterous whore; she answered that 'she meant whore, and soldiers' whore'.

In spite of the problems of successful prosecution and conviction (noted above) many accusations against soldiers were made before the burgh court, certainly the only hope of redress for the civilian inhabitants. Arthur Wright was a married soldier, living in the town. In 1703 he and his wife had a furious row with David Gillespie and his wife, involving a great many insults and threats of violence; amongst the more general noise, several witnesses confirmed the account of Alexander Duncan, a 20 year soldier in the Earl of Mar's regiment who heard a woman shouting from inside Wright's tenant's house. He knocked on the door which was eventually opened to reveal a soldier in the bed and Helen Wallace, Wright's tenant, complaining that he had 'abused' her; it was suggested that Wright and his wife had connived with this

man and a colleague to facilitate their raping Wallace³⁷. Much more typically, in 1695 a woman accused Lieutenant William Davidson of striking her grandson. In 1700 William Baker, a soldier, was accused of sheltering Sergeant McColl, 'a common thief'. The court cases make it clear that soldiers, like the gunner William Pollock, not only had ready access to weapons but routinely carried them – though they might not use them to full effect. So, in September 1708 Sergeant Fergusson was accused of beating Duncan Menzies with a sword, staff and pistol – but not of shooting him or using the sword edge. It all contributed, nonetheless, to an atmosphere of intimidation; when two officers demanded drink during the sermon time in June 1708, the inn-keeper served them, preferring the court's reproof to a dispute with the soldiers.

It must slowly have become apparent that Stirling's newly militarised status was not a passing phase and that some sort of institutional adjustments were needed. In 1719, for example, recognising that if soldiers quartered in the town became sick it was 'very troublesome' to the families they lodged with, the town set up a 'hospital' to take care of them. Invalids became more of an issue after 1783 when numbers of veterans increased at the end of the American war. The period of the French wars, (1793-1815) saw a new military hospital established in Argyll's Lodging and the building of the Esplanade as a parade ground for the military displays which were becoming so fashionable⁴⁸. The same period saw manufactories set up in and around the town, weaving tartans and other materials to supply the huge demand from the army. But many of the castle soldiers and veterans continued to work in the town and were thought to push wages for local people down⁴⁹.

By the 1790s, tourism was of growing importance (again, partly in response to the French wars). The castle quickly became one of the main attractions for visitors and featured prominently in the early 'guide books'⁵⁰. But, again there was the potential for conflict exemplified by the issue of drains. In 1808 all the mess from the castle latrines was simply discharged through the castle walls; when the road through Ballengeich was to be improved, the council wrote to the military, asking for the 'necessaries' to be moved⁵¹. Perhaps in consequence, the latrines were moved to the other side of the castle and the mess discharged through pipes to tanks in the field below, where it was intended as manure for the Kings Park Farm. However, the farm workers refused to empty the tanks and the stench did nothing to enhance the new walks round the castle, purpose-built to provide gentle walks for genteel visitors⁵². That problem was not remedied until the castle was connected to running water and sewers later in the century.

As a fortress, the castle was redundant by the end of the 18th century. Still, visitors were occasionally amused (or annoyed) by the need to provide evidence that they were not spies. And even in the mid 19th century, the army rejected Charles Rogers' proposals for planting trees on the Gowane Hills on the grounds that they might provide cover for attackers⁵³. By that time, the castle was mainly a recruiting depot but there were still 268 people living there

in 1841 including 74 women. The later decades of the 19th century saw major army reforms, designed to counter failing recruitment and morale, consequent on the growing disparity between the expectations of society and conditions obtaining in the army. A new regimental organisation included the creation of the Argyll and Sutherland Highlanders with Stirling Castle as the Regimental HQ and main recruiting depot from 1881. Other impacts in Stirling included the building of married quarters (now Castle Court) outside the castle (1870s), the army's takeover of the town's 1847 jail (Plate 4) as the only military prison in Scotland (from 1888) and the building of the Forthside depot, its storage facilities and ship and rail links servicing the army's new needs for connectedness and mobility in face of new technologies⁵⁴.

Between 1905 and 1910, recognising its heritage value, responsibility for the maintenance of the buildings of castle was gradually transferred from the Ministry of War to the Ministry of Works though it was not until March 1927 that a formal admission charge of 1s (5p) for adults and 6d (2.5p) for children was introduced – the employment of salaried guides failing to reconcile some visitors and locals⁵⁵. By that time, of course, the need for any major army presence at Stirling Castle had vanished and in 1964 the army finally left, bringing to an end a long (and sometimes difficult) relationship.

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E69/ Exchequer Hearth Tax Returns
E100/39 Exchequer Records, Muster Rolls
GD124 Mar and Kellie Papers
JP19/2 Justice of the Peace Court records
NAS MW1/ Ministry of Works records
PC1/ and PC2/ Privy Council of Scotland, Acta and Decreta
RHP2732 Register House Plans, plan of Castle Court

Stirling Council Archives [SCA]
B66/9 Stirling Burgh Register of Deeds
B66/16 Stirling Burgh Court Records
B66/20 Stirling Burgh Council Record
B66/23 Stirling Burgh Treasurers' Accounts
B66/25 Miscellaneous Stirling Burgh Court Records, vouchers etc.
CH2/1026 Stirling Kirk Session Minutes
SC1/1 Minutes of the Commissioners of Supply and Excise for Stirlingshire

¹ Harrison, 2007. p.29.

² Laing, 1804 p.148-9.

³ NAS GD124/11/1; RSS, volume V, entries 900, 901, 2977; NAS GD124/3/11. Garitour, a watchman on a tower or wall; the evidence is for several layers of the watch.

⁴ Merriman, 2000, p.136; RCAHMS, 1963, p.304-6.

- ⁵ SCA B66/16/12 23 & 30 Sept 1658; B66/16/21 Nov 1721. The spelling and language of all quotations has been modernised. For ease of reading, I omit the word 'allegedly' from the various accounts of court-cases.
- ⁶ SCA CH2/1026/3 14 April 1645.
- ⁷ Records of the Parliaments of Scotland [RPS <http://www.rps.ac.uk/>], A1644/1/1; *ibid*, 1644/6/64, accessed 17 June 2011. The history of the garrison would certainly repay further work. For the changes within the castle to accommodate the expanded army presence see Fawcett, 1995, p.77-112.
- ⁸ NAS GD124/11/35 muster roll for 1685; E100/39/7/1-60 muster rolls 1682-1703.
- ⁹ NAS GD124/11/53.
- ¹⁰ For these committees see Harrison, 2006.
- ¹¹ NAS GD124/11/27; NAS E69/22/1. NAS PC1/48 p.582.
- ¹² Whiteford, 1992, p.35; SCA B66/16/19 3 June 1693; SCA B66/20/6 30 May 1696 and 28 Sept 1701; SCA B66/16/20 5 Oct 1695. For the burgh and the constabulary see Harrison, 2010, p.50.
- ¹³ Harrison, 1991, p. 69.
- ¹⁴ NAS E100/39/7/20; Whiteford, 1992, p., 17; SCA B66/16/22 11 March 1704 and B66/25/779/1 bundle 3 item 3; B66/20/8 14 Dec 1724; NAS JP19/2/7 8 Nov 1698.
- ¹⁵ B66/25/779/1 bundle 5 item 63, 6 April 1706; Turnbull, 1893, p.383.
- ¹⁶ SCA B66/25/779/7 Andrew Wallace against Lt George Nicolson, 28 Jan 1751.
- ¹⁷ Colley, 2003, p.117-9; Renwick, 1889 p.151 & p.163 for similar incidents.
- ¹⁸ RPC Series 3 vol I p.100, p.114-5 for tumult in Stirling between English garrison and local people; SCA CH2/1026/4 June-December 1660 *passim*.
- ¹⁹ SCA B66/16/12 3 Dec. 1657; Harrison, 1998, p.122 & p.129.
- ²⁰ SCA CH2/1026/3 Sept and Oct 1644 *passim*.
- ²¹ SCA B66/25/373 Sept 1648. The difficulties of estimating the real population are discussed in Harrison, 1986, p.99 and p.109.
- ²² Harvey, 1908, p.216.
- ²³ Recruitment, pay and quartering are all discussed in Barnett, 1974, p.136-143; for an example of the oppressive use of quartering see RPC, Third Series, volume XVI, 1691, p.244-6.
- ²⁴ Renwick, 1887 p.208 5 April 1653; Renwick, 1889 p.3 18 April 1668; *ibid* p.61-62; *ibid*, p.84; SCA B66/25/384/1-19 April to August 1689 accounts and receipts relating to the provision of baggage horses and other services by the town for the army.
- ²⁵ Harrison, 2007, p.35-7.
- ²⁶ SCA B66/16/15 5 Jan 1678; B66/16/16 12 Dec 1678; B66/20/6 24 July 1694; *ibid* 26 Jan 1695; *ibid* 16 Feb 1695; *ibid* 12 Oct 1695; *ibid* 7 Feb 1696; *ibid* 15 Nov 1701; *ibid* 27 Dec 1701; *ibid* 19 Dec 1702; B66/20/7 10 Feb 1705; *ibid* 29 Nov 1709. See SCA B66/25/458 for one instance of 'bad behaviour' by a quartered officer in the house of a former provost.
- ²⁷ Renwick, 1889 p.74; *ibid*, p.115; *ibid*, p.148.
- ²⁸ Renwick, 1889 p.61- 62; *ibid* p. 126-7.
- ²⁹ Cook and Morris, 1916, p.73.
- ³⁰ NAS GD124/11/46 tack of castle sutlery, Feb 1693; GD124/11/53, report on brewing in the castle, 1710.
- ³¹ SCA CH2/1026/4 20 Nov 1655; B66/20/4 31 Aug 1654.
- ³² McKay, 1833, p.5; *Leven and Melville Papers*, 1834, p.200; RPC p.152, 30 Aug 1689.
- ³³ NAS GD124/15/985/1 and /2.
- ³⁴ *Stirling Antiquary*, volume 5, p85; NAS GD124/15/478 Holburn to Erskine; Renwick, 1889 p.110.

- ³⁵ RPC XIII p.76; *ibid* p.520; Harvey, 1908, p.215.
- ³⁶ Sources for local methods include SCA SC1/1/ Minutes of the Commissioners of Supply and Excise for Stirlingshire 1693-1740 particularly March and April 1696; SCA B66/20/7 14 May 1709.
- ³⁷ *RPS*, 1689/3/191. Date accessed: 20 July 2011.
- ³⁸ Harrison, 1991, p.5-8.
- ³⁹ SCA B66/16/22 18 & 19 May 1702; B66/25/779/1 Bundle 1, item 6.
- ⁴⁰ Chambers, 1859, volume II p.437-8.
- ⁴¹ SCA B66/9/11 p. 243; SCA B66/25/778/2 Warrants of Deeds, 1702.
- ⁴² SCA SC1/1/A 2 April 1696.
- ⁴³ NAS PC1/51 11th Dec 1697 and 14 Dec 1697; PC2/27 20 Jan 1698; SCA B66/23/1 Accounts 1697-8 discharge f. 2.
- ⁴⁴ Renwick, 1889 p.61; *ibid*, p.126; SCA B66/25/367 May 4 1644 bond for 1800 merks for paying wages to soldiers.
- ⁴⁵ SCA CH2/026/3 18 December 1656
- ⁴⁶ Renwick, 1889 p.126.
- ⁴⁷ SCA B66/25/779/1 bundle 1 item 21.
- ⁴⁸ Sutherland, 1794, p.158; Renwick, 1889 p.162; *ibid* p.239; *ibid* p.248; SCA B66/23/2 and B66/23/3 include inventories of the equipment, bedding etc for the hospital; Ronald, 1906, p.173-5; RCAHMS, 1963, p.277-284.
- ⁴⁹ Sutherland, 1794, p.65 & p.158.
- ⁵⁰ Sutherland, 1794, p.99-108; Chambers, 1830, p.10-26.
- ⁵¹ SCA Stirling Council Minutes Index, 25 April and 8 October 1808.
- ⁵² PP, 1852-3 volume LV 'Woods and Forests', pp.57-8 and pp.105-116; PP 1852-3, volume LVI, 'Woods and Forests', p.521.
- ⁵³ Ritchie, 2010, p.32-3; Rogers, 1876, p.115-6.
- ⁵⁴ NAS RHP 2732 Plan of 'Castle Court' site; National Archives (Kew) WO78/3351, plan of prison buildings; *Stirling Journal* 12 Sept 1935 p.7; *Stirling Observer* 18 June 1935 p.7; *Stirling Observer*, 4 Nov 1886, p.4.c.4; 31 Jan 1889, p.4, c.3; 31 October 1889, p.4. c.5. Barnett, 1974, p.304-315; Fawcett, 1995, p.101.
- ⁵⁵ NAS MW1/81 and /99; *Stirling Observer*, 8 March 1927 p.7 column 5.

FALLIN'S GOTHENBURG PUBLIC HOUSE AND STIRLING'S FORGOTTEN SWIMMING POOL

Craig Mair

On 4th November 1910 the Gothenburg public house opened its doors for the first time in the village of Fallin. The name of the pub was no accident or idiosyncrasy, for the idea of 'Gothenburgs' had been growing for some time in Scandinavia, and had now spread to Scotland.

Responding to a growing temperance movement in Sweden, where spirits drinking was especially a problem, the city of Gothenburg had reorganised its liquor licensing system in the 1860s. The new system limited the number of drinking places, and in these pubs the sale of spirits was reduced, while that of beers, wines and especially soft drinks and tea was encouraged. Many public houses had no seats or tables, to discourage drinkers from staying there too long, but they sometimes did have games, books, and newspapers which helped to provide a more uplifting atmosphere.

Above all, the companies which ran public houses in Gothenburg were required to use all but 5 % of their profits for the benefit of the local community – especially by providing local amenities. Since running a pub would therefore hardly be a very profitable business, these places were increasingly operated by charitable groups of local citizens (and a few brewery owners) who wished to provide their area with social improvements. And so was born the 'Gothenburg system'. Other than for absolute teetotallers it suited most people – it reduced the consumption of spirits (which in Sweden 1850 was a staggering 45 litres per person per year in 1850), it still offered the worker his drink of beer, it 'civilised' the drinking den, and it improved local amenities from the profits made.

Soon the idea began to spread, first throughout the rest of Sweden and then to neighbouring Norway and Denmark. Then, in the late 1890s, it began to appear in Scotland, more than in England and mostly in the mining communities of east central Scotland. Research has not yet explained why this occurred but it may have been through the strong links which already existed between Scotland and Gothenburg. The Swedish East India Company, Gothenburg's University of Technology, its first significant shipyard, its first cotton mill and even its first recorded game of football in 1892 were all the work of Scottish entrepreneurs.

Whatever the reason, the idea spread to the mining communities of east Scotland. At a time still of temperance pressure in Britain, here was a way for the miner to get round these restrictions and have his pint of beer. Some pubs were opened by mining companies who perhaps saw a way of providing the mining villages which they built with social improvements at no cost to

themselves. Others were opened by the miners themselves, who formed Providential Societies, sought shareholders and then, with that community pride for which mine workers were famous, provided their bleak villages with their first amenities.

The first Scottish 'Gothenburg' (often shortened to 'Goth') was opened in 1896 at Hill of Beath near Crossgates in Fife by the Fife Coal Company. By 1901 its profits had already provided the local community with an 'institute' (probably a meeting hall and reading room) and a bowling green. Others quickly followed. The Kelty Gothenburg opened in 1899 and by 1900 had provided a local library and a bowling green. Others (at least fifteen) sprang up all over the Fife coalfield, and then also across Lothian. In 1899 the Newtongrange 'Goth' opened, followed by one at Armadale in 1901 and numerous others across the Lothian coalfield. Closer to Stirling there was one at Standburn, near Falkirk. In 1903 there was talk of opening a 'Goth' at Cowie and later there were plans for Goths at Bannockburn and Menstrie, but these all came to nothing.

The rulebooks developed by the first Gothenburg societies in Scotland became the template for the others and so a similarity of ideas and attitude was maintained. Soon there were even a few Gothenburgs in other parts of Scotland, sometimes even where there was no mining industry, as at Methven (Perthshire), Brechin and Banff. By 1910 there were around 35-40 such pubs in Scotland.

One of the last to appear was at Fallin. This is not surprising for the Polmaise mines at Millhall and Fallin were not opened until around 1904 and housing was not properly provided for the miners there until a few years later. Although little more than a small street of houses was built at Millhall (where the Caledonian Auction Mart is now), the community which developed a mile and a half away at Fallin was more substantial. By 1910 the village already had a population of 989, a school, a church and a co-op shop. But it didn't yet have a public house or any other social amenities.

During mid-1910 this changed when a group of seven men met in the Polmaise 3 and 4 mine office at Fallin. They included the manager of the Polmaise 1 and 2 mine at Millhall, the manager of the Polmaise 3 and 4 mine at Fallin, the Fallin mine's cashier, the local doctor and three miners. From this group sprang Fallin's Gothenburg pub. By late summer they had formed a Provident Society with a committee, had added more shareholders, had acquired land from the local landed family the Murrays of Polmaise, had a legal firm working for them in Stirling (Hill and Robb still do, over a century later), had a liquor license from the Burgh Licensing Court, and an architect working on plans for the public house building. This was Ronald Walker, of the firm McLuckie and Walker. Along with the Bruce Memorial Church at Cambusbarron and the Provost Bayne Clock Tower at Stirling Bridge, the design of Fallin's Gothenburg was one of Walker's last projects before his death in July 1911.

The building, albeit with various later additions, still stands today, but when first designed it had a separate community hall upstairs where flats are now – the first sign of the founders' intention to provide their village with recreational facilities. The public house opened (with no tables, chairs, heating or even lighting) on 4th November 1910 and quickly became an important part of the village. On 2nd December the upstairs hall was opened with a concert and soon various village groups ranging from the Miners' Union to a dancing class, the Co-op's evening education classes and the Rechabites were all renting the hall for meetings.

Any committee which included two mine managers, a pit cashier, the local doctor and three ordinary mine workers might seem to be an unusual alliance, but all seven of the men who first established the Gothenburg at Fallin were also very keen bowlers. A Fallin bowling team had already competed in 1910 in the Murray Cup, even although it had no home green or club house. It is possible that the entire Gothenburg project was initiated by these men simply to use the profits to provide the village with a bowling green!

Having opened the public house in November, they did not wait long. By the end of 1910 land had been acquired for a bowling green and a man had been found to prepare it. The Polmaise Bowling Club duly opened in June 1911, with most of the Gothenburg committee either on its committee or at least in its team. Apart from the Goth's upstairs hall, it was the first public asset which the bar's profits gave to the village. For decades afterwards the Goth continued to pay for the bowling green's improvement, the provision of a club house, paths and walls, and a green keeper. In return the bowlers and their competitors socialised in the bar after matches.

Having provided their top priority amenity for Fallin, the Gothenburg committee then went on to add much more to the village's life. At the twice-yearly meeting of shareholders suggestions and requests were heard and, where affordable, were carried out. By the end of its first three years the bar's profits were already supporting (in addition to the bowling club) the provision of a local nurse in the village, a reading room with a regular supply of newspapers and periodicals, a recreation club complete with gymnastic equipment and a hall keeper, a local library, RSPCA help for local pit ponies, evening classes for miners at Millhall, the Fallin Violet football team, the Fallin Boy Scout troop and the Scouts' pipe band, including their instruments, uniforms and piping teacher. In addition, the committee also supported a local soup kitchen for mining families during the huge miners' strike of 1912.

At the October general meeting of shareholders in 1912 the first mention of a swimming pool was made when, according to the minutes of the Fallin Public House Society Ltd:

The Secretary presented a sketch of a proposed swimming pond and baths along with a caretaker's house... After discussion it was left over meantime and during

the time between this meeting and the next, the committee ascertain if water could be got for the purpose of baths, and also if it could not be made with a pond 25 yards instead of 30 feet.

According to Hugh G. Kerr in his book *Fallin: Tales from a Mining Village*, When the villagers got the choice of a bowling green or a bathing pond the Fallin men chose the bowling green with the Millhall men opting for the bathing pond. If this choice was ever offered to the two communities (which is doubtful) the evidence is now lost. In any case, since so many of the Goth's first committee were keen bowlers, there was little doubt that the bowling green would be the first village asset to be provided from the Goth's profits. Nevertheless, Millhall's pond certainly did appear eventually.

In January 1913 the committee decided to give £45 to the 'Millhall Scouts to form a temporary swimming pond... (provided it was also) for the use of the Fallin Scouts and the adults of the village of Fallin'. At February's bi-annual General Meeting:

Considerable discussion took place regarding the benefit this would have and also the inadequate sum this was, as the lowest offer they had was £83 to make it. It was clearly stated by the meeting that if such a swimming pool was made the inhabitants of the Village of Fallin would have an interest in it equal to Millhall. And as water could not be got for such an object at Fallin the meeting agreed to finance this scheme.

A month later the committee agreed to:

...give the Millhall workmen a Donation of One Hundred Pounds to enable them to proceed with the erection of a Swimming pond at Millhall, and Mr Muir [colliery manager at Polmaise 1 and 2] to overlook the work.

At that time there was not yet any swimming pool in the burgh of Stirling, but there seems to have been a local desire that there should be one. In April 1913 the *Stirling Observer*, which had generally adopted a disapproving temperance tone towards the establishment of a pub in Fallin, changed its view and wrote:

The Gothenburg public house at Fallin continues to illustrate the material advantages of disinterested management. On the year's working, after paying a dividend of 5 per cent... a sum of over £300 has been divided among such objects as the Nursing Association (£100), the Bowling Club (£50), the proposed bathing pool at Millhall (£80), Village Library (£50), Boy Scouts (£25). Let us suppose that one of the three licences conducted in our Burgh property was run by the Town Council on 'Gothenburg' lines, and produced a net profit of, say, £300 to £500 per annum. Suppose again that the profits were ear-marked for public baths, an object which is commanding considerable attention at present. The town council own three public-houses, however, and under 'Gothenburg' management we

might have three sets of profits. We would soon be within measurable distance of securing baths, wouldn't we? But dear, dear what is the use of advocating such a sensible solution to the problem.

Meanwhile work on the pool at Millhall progressed and by the summer of 1913 it was ready. The pool stood beside the pit bing, at that time just across the colliery railway from the Polmaise 1 and 2 pit, on what is now farm land just south of the Caledonian Livestock Market, beside a footpath. It was described by the *Stirling Journal* as 25 yards long and 12½ yards wide and built of 'nicely finished white glazed brick work'. Water was originally obtained from a lade (admittedly described in 1917 as 'not exactly crystalline in its purity'), but in those early days there were also hopes that steam from the colliery machinery would be used to heat the water (although this does not seem ever to have happened).

The pond was officially opened on Saturday 5th July 1913 by Mr R.J. Steuart of Steuarthall in a ceremony presided over by Millhall Colliery manager Robert Muir. The original subscription was sixpence (2½ p) for adults and half price for children. This included the services of two ex-military swimming instructors – John Cullen, who supervised the pool during the day, and John Johnston who did the same during summer evenings until sunset.

In early August 1913 the first swimming gala was held at Millhall, attended by over 70 spectators and featuring entertainment from the Millhall Scouts Pipe Band. The organisers had already acquired cups and prizes including a trophy presented by Robert Muir to H. Miles, the winner of the 100 yards race. The most entertaining event of the day was probably the 'duck hunt' in which a live duck was thrown into the water for the swimmers to try and catch.

Later in August the bi-annual General Meeting decided that:

...the accounts of the Swimming Club in connection with the Swimming pond and Baths erected at Millhall to be paid by a Donation from the surplus funds of the Society. Before deciding, the Secretary read an agreement that the inhabitants of the village [ie Fallin] should have equal rights regarding it and vesting the Pond under trustees consisting of the Managers of the pits at Millhall and Fallin with the Secretary of the Society and on the motion of Robert Gemmell seconded by John Gemmell [both, incidentally, miners from Millhall] it was agreed to sign the agreement amount of debt on the Pond £308, inclusive of the £100 granted last meeting.

In October 1913 a conveyance and deed of agreement was also signed by Gothenburg committee members Robert Gemmell, Dr Porter and secretary Archibald Kerr 'conveying the pond to Mr Robert Muir, Manager of Nos 1 and 2 Pits and to Mr Wm Laird, Manager of Nos 3 and 4 Pits and Mr Archd Kerr and their successors in office'. As the *Stirling Journal* wrote, *The promoters [of the swimming pond] are much indebted to the Fallin Gothenburg Public House Trust for a handsome donation towards the cost of construction.*

In fact the Society seems to have paid for virtually everything to do with the establishing of the pool. This later included the provision of a sparred walkway round the poolside and several donations towards its subsequent maintenance costs.

In spite of this help, the Gothenburg committee was keen to devolve responsibility for the clubs they sponsored to the club members themselves. For example, when 'parties wished the Baths to be opened' in May 1917 (presumably for the summer, since the pool was an open air one), the committee decided that they would agree 'if a committee of the residents of Fallin could be got to assist in the management, and it was agreed to try and get such a committee'. This insistence on Fallin's participation in the pool's activities must have been successful because the pool was reported open later that year.

In spite of the outbreak of World War One, the pool continued to be busy. In June 1917, for example, the *Stirling Observer* recorded that it was being used by well over 400 people. In July 1917 the committee gave £5 to the Fallin Boy Scouts' pipe band to enable them to attend a Red Cross fund raising gala day in Stirling, but another £10 was given to support a gala day at the Millhall swimming club, in aid of 'comforts for the soldiers who have enlisted from the Colliery'. This gala seems to have been an especially entertaining occasion. Although several races featured rivalry between competitors from the Black Watch and Cameron Highlanders regiments, the day also included a 'greasy boom' competition over the water, a hilarious bathtub race across the pool (several tubs sank), a blindfold race, diving and trick swimming displays, and a demonstration of lifesaving skills by six ladies from the Alloa baths.

When peace returned the pool continued for a time to be a popular community asset but eventually the economic downturn of the 1920s began to have an effect. At the beginning of 1921 the Gothenburg committee was still making donations to many local causes, including the bowling club (£70), the local nurse (£150), the Fallin child welfare centre (£25), the Fallin quoiting club (a fence round their pitch), the Polmaise male voice choir (a piano), the Fallin Violet football team (a pavilion) and no less than £200 prize money for a projected highland games to be held at Springkerse. But then in April 1921 over a million British coal miners, including those at Fallin and Millhall, went on strike and the picture changed dramatically.

By late April the Gothenburg's profits were being used to mitigate the hardship caused by the strike. £100 was donated 'for the relief of urgent necessitous cases in Fallin village'. Another £50 went towards a communal kitchen in Fallin. Then, as the effects of the strike penetrated deeper into the community, £50 was given in June to the bowling club as 'assistance owing to the short subscriptions owing to the strike' and then £20 to the swimming baths committee at Millhall 'owing to the Miners' Strike affecting their contributions'.

From then on the local economy, at least in Stirlingshire's mining villages, never really recovered. By 1925 profits from the bar were so low that nothing at all could be given to the swimming baths committee that year. Then came the General Strike of 1926 and again the local miners came out solidly – over 6000 men from the mining villages around Stirling. Once again the Gothenburg's dwindling profits went first to the most essential needs – a local soup kitchen, the local nurse and the child welfare clinic, but not to the swimming pool.

In 1929 the committee finally withdrew its support completely from the Millhall swimming pond. Since 1927, with fewer miners at the pit and those who remained on lower pay, the numbers using this pool had been declining and repairs were growing more expensive. Demands that the swimming club be more self-sufficient had failed, so in April 1929 the committee approached Archibald Russell Ltd, the coal company, to ask if they would take over responsibility for the pool (which was located right beside the Millhall mine). In May Russell's agreed and thereafter all mention of the pool stops in the Gothenburg committee's minute books.

In May 1933 proper pit baths were built at Millhall using money from the local Miners' Welfare Fund (the building is now Smith's Restaurant) and it seems likely that the previous Millhall swimming pond quickly went out of use. By the time of the 1942 Ordnance Survey map it was gone, and only an overgrown duck pond and a few fragments of bricks and rubble remain of the pool today – the last signs of Stirling's forgotten swimming pool.

The Gothenburg at Fallin still exists (one of only three in Scotland run on their original principles) and its committee still contributes to local life including the old age pensioners at Christmas, the community fireworks display in November, the local primary school, the mother and toddler's group, the darts club and so on. Many of its contributions to the village, such as the war memorial and the bowling club, still stand. Sadly the swimming pool at Millhall is the one which has disappeared.

Craig Mair is the author of *The Gothenburg 1910 – 2010: a hundred years of history in Fallin*, published in 2010 by the Fallin Public House Society Ltd.

RECORDS OF HER MAJESTY'S CUSTOMS AND THE PORT OF ALLOA REGARDING THE 1745 REBELLION

Neville Dix and Murray Dickie

Extracts from articles published in the ALLOA ADVERTISER 1868 -1870.

Introduction:

In 1868 the editor of the **Alloa Advertiser** made a formal request to the Port Commissioner of Alloa for permission to search the Custom's records for publishable material on the history of the port which may be of interest to local readers.

"The Editor of the Alloa Advertiser recently made application for liberty to peruse the old records preserved in the Custom-House at this port, with the view of ascertaining some particulars relating to the trade and business of the port carried on in former times, and of taking extracts and gleanings any information of interest relating to matters of a local nature that may be fallen in with, purely in the light of antiquarian notices for publication in his paper."

Permission was received from the Commissioners:

"THE HONOURABLE COMMISSIONERS of HER MAJESTY'S CUSTOMS having been pleased to grant application, and authorize the COLLECTOR to furnish the editor with the information required, the former will endeavour to cull from the materials preserved, chiefly letter books, whatever may appear most interesting, in respect of the commerce of Alloa, Airth, Kincardine, Stirling, &c., and any other incidents worth noticing that may occur in the course of perusal, adding by the editor's request, any remarks that may be necessary, by way of explanation, or tending to increase the interest of the topics introduced."

Subsequently the editor commissioned the then collector of taxes at the port, Mr G.C. Coats, to write ten articles for publication, however, despite numerous searches, only nine have been identified. This might have been because in 1870 Mr Coats had been promoted to Collector at the Port of Stornoway and presumably no longer had access to the Alloa records. The nine papers were published in the Alloa Advertiser as indicated:-

- 1 - 09-05-1868,
- 2 - 23-05-1868.
- 3 - 20-06-1868.
- 4 - 25-07-1868.
- 5 - 12-09-1868.
- 6 - 24-10-1868.

- 7 - 28-11-1868.
- 8 - 28-05-1870.
- 9 - 16-07-1870.

The records contain a number of significant and interesting references to the 1745 Jacobite rebellion and its aftermath. At the time of the rebellion the port of Alloa was put on alert and "much commotion" was felt locally, as the editor noted, there would have been concern that there were those in Alloa not unsympathetic to the Jacobite cause.

The writer of the First Statistical Account of the Parish of Airth (1796) says: *"The trade in Airth, prior to the year 1745 was very considerable, but has since been on the decline, owing to a number of vessels being burnt at that period. The occasion of this was that, the rebels having seized a small vessel at a narrow part of the river called Fallin, by means of it, transported a number of small brass cannon to the harbours of Airth and Dunmore, near each of which they erected batteries and placed their cannon. Upon the King's vessels coming from Leith to dislodge them, a reciprocal firing took place. The commanders of the King's vessels, finding their efforts ineffectual, sailed down the river with the tide and gave orders to burn all the vessels lying on the river-side to prevent them falling into the hands of the rebels, who might have used them as transports, and harassed the people on both sides of the river. The loss of these vessels was severely felt by the trading people in Airth and trade has since removed to Carronshore and Grangemouth."*

It would appear that an attempt was made by the rebels to capture vessels lying in the river and that they succeeded in taking possession of a small vessel lying at Fallin. Their object was, however, defeated by prompt measures having been taken, under direction of the authorities, to remove as many vessels as possible out of their reach, by taking them up to Stirling, where they were under the protection of the Castle guns, or to Bo'ness, which was further removed from the scene of action, and where probably a large fleet of vessels would be congregated together, and a greater force available for resisting the attempts of the rebels. However, the rebels in the course of their progress to the capital visited Bo'ness: for a party of them entered that town on a sabbath morning playing the bagpipes, and causing, as may be well imagined, great excitement. They came with the intention of robbing the Custom-House, their object being to get money. They failed in this, but succeeded in carrying away a number of broad sword-blades, cutlasses, &c., which formed part of a shipment intended for Germany, made by an armourer in Glasgow, on a Treasury warrant.

The following extract from a letter written by Mr John Erskine, the Comptroller, to the Board of Customs, shows the part taken by the officers at this port in the efforts made to prevent the vessels lying in the river being seized by the rebels and the concerns about associated criminal activity:-

9th September, 1745.

Honoured Sirs, - In the Collector's absence, I beg leave to send your Honours two letters, one from Mr Cochran, Bailie of the Royalty of Bo'ness, the other from the Collector and Comptroller there, in relation to the sending all vessels and boats to Bo'ness, and though the Lord Advocate's order mentioned in Mr Cochran's letter, nor the copy thereof, was sent, I thought it right in the present juncture to order all the vessels and boats there accordingly. None are now here, save one ship that ran aground yesterday when the rest went from this; she is now got off and is to leave this place next tide. There are also several vessels and boats betwixt Elphinstone and Carron water, but the vessels being neaped will not float till Wednesday. There are none on this side the river save one boat at Kincardine, to carry the sailors to their sloops when they float.

Among the vessels that went from this to Bo'ness yesterday morning, was the Fortune of this place, John McKenzie, master, who lately applied to your Honours in relation to some spirits with which he was to proceed to Norway, and nine barrels soap he was to land here, these spirits and soap being on board his ship when he left this; and Robert Stevenson and John Young, tidewaiters, being placed on this ship who have come here to-day and informed that about three miles below this they were deforced by a great number of people, who confined the two tidewaiters, and carried off both soap and spirits, of which last there was 38 casks, but the tidewaiters knew some of those concerned. The Surveyor with the Custom-house boat was at this time, as he has been ever since Tuesday, employed in ordering the boats on the river to Bo'ness and Stirling.

Following the failure of the rebellion Customs staff were involved in efforts to prevent the escape of rebels by sea. The Board wrote to the Comptroller at Alloa:

"28th July, 1746

GENTLEMEN, - Intelligence being received that the Pretender's eldest son has left the Highlands, and is come towards the coast endeavouring to make his escape by shipping, by special order of the Lord Justice-Clerk, you are instantly to lay an embargo on all ships and vessels throughout your precinct, and to put all officers on their guard with the utmost vigilance to watch all creeks and places of embarkation, and to stop and examine all passengers and strangers, and to seize all suspected-persons, and to acquaint us from time to time with all occurrences.- We are, &c.

(M. Cardonne.
"Signed (Rosse.
(Rd. Somers."

A few days afterwards we find the Board writing that:

"the intelligence that the Pretender's son had left the Highlands, and was come towards the coast to make his escape by shipping proved uncertain, you are by order of the Lord Justice-Clerk, immediately to take off the embargo laid in consequence of the said intelligence."

The Board of Customs, in common with other public departments, did all in

their power to discover those in the service who were disaffected to the new dynasty, and gave directions that all officers who frequented non-jurant meeting-houses were to be suspended; and the Collector and Comptroller at Alloa, were directed to “*send certificates of their own, and of the behaviour of the other officers, signed by the minister of the Parish, or by a Justice of the Peace and Civil Magistrate, whose loyalty and attachment to the present happy establishment are well known.*”

Even after the rebellion had passed, there were references to the involvement of His Majesty’s Customs. This letter from the Commissioner of Customs, directs that every precaution to be taken to prevent any rebel escaping out of the country. It appears that ships, and passengers too, required to be furnished with passes.

“8th October, 1746.

GENTLEMEN, - The Right Hon. the Earl of Albemarle having signified to us that he has received information that many of the rebels, of the first rank, are still lurking upon the east coast of Scotland, waiting the opportunity of escaping in some vessel from the ports of the said coast, and desiring us to give directions to the several officers of the Customs stationed at those ports, in the strictest manner to search all outward-bound vessels of whatever size, lest any rebels should be concealed in them; and also to make inquiry where such rebels may be lurking, in order to their being apprehended, and likewise to give notice thereof to the next adjacent commanding officers of His Majesty’s forces, keeping a correspondence with them, and who are to give assistance at all times when required upon the said service.

We direct you in the strictest manner to observe the above direction, and to acquaint us from time to time with all occurrences.

*(T.R. Sommer,
Signed, (Alex Arbuthmott,
(M. Cardonnel.*

To Collector and Comptroller, Alloa.

The pursuit of those involved in the rebellion continued. Mr Grahame, Surveyor at Alloa, and Mr Mudie, the Collector’s clerk, were both subpoenaed to appear at a trial, held at Carlisle before the judge there on the 9th September, 1746, in behalf, and for the exculpation of Mr Buchanan of Arnprior, against whom a bill was found as being concerned in the rebellion. It appears that they gave declarations for the Crown of what information they possessed, but declined doing so for the defendant, not having any authority from the Commissioners of Customs to do so. Of the nature of the evidence which Mr Grahame and Mr Mudie were expected to give at Carlisle no reference is made in the books, however, Mr Buchanan of Arnprior was convicted and received sentence of death.

Among those supporting the Rebellion were many of our nobility and gentry. By way of conciliating the offended feelings of the nation, the strong arm of the law having been severely used, "the Government got an act of indemnity passed in June 1747, granting a pardon, with certain exceptions, to all persons who had been engaged in the Rebellion." Among the exceptions, we find the Earl of Kellie, ancestor, to the present possessor of the title, a nobleman who is well and favourably known in this community, and whose family have long been intimately connected with Alloa. Another of the persons excepted from the Act of indemnity, was "Graham of Airth," in which family the estate of Airth still continues.

Mr Walter Grossett, who was Collector at Alloa from about the year 1728 to 1747, and whose name frequently appears in the books, must have taken a very warm interest in the Rebellion, judging from the fact that, if history be true, he formed the resolution to assassinate Prince Charles, a resolution, which if it had been put into execution, would have made one of the Alloa Collectors of Customs notorious in history. We gather this information from the following extract of a letter taken from a work edited by James Browne, LL.D., advocate, entitled "A History of the Highland Clans," published in 1855, volume fourth - page 87. Extract of a letter, Sir James Harrington supposed to Prince Charles.

"Avignon, August 6th, 1751.

SIR, I received yesterday the following account from Captain Holker of Ogilvy's Regiment, which I have the honour to send you. Blairfetty is just returned from Scotland and says it is currently reported among the Prince's friends there, that one Grosert, Collector of the Customs at Alloa, hath left the country with intention to assassinate the Prince. He is a middle-aged man, about five feet five inches high, well-made, of a black complexion, and pitted with the small-pox, his eyebrows large and black; inclining rather to lean than fat. He was married to a German woman, the daughter of the old elector's milliner. He hath a remarkable genius for clock-work and all sorts of mechanism. In case you meet with the person described, very little ceremony is to be used. I have taken all precautions necessary here to secure him, and shall certainly watch all carriages in case he should take this place in his way."

There are no indications in the Custom-house books of any circumstances occurring in connection with the rebellion in which Walter Grossett figures and he was no longer a Collector at Alloa by the time that this letter was written, having ceased to hold that office after 1747. However, there had been interest expressed in his activities by the Court of Exchequer in 1748 resulting in a letter to the Collector and Comptroller at Alloa:

*"Custom House, Edinburgh,
14th September, 1748.*

Gentlemen,

The Barons of Her Majesty's Court of Exchequer having transmitted to us the petition of Mr Robert Dundas, in the name of his Grace the Duke of Athole, Thomas Bisset of Glenelbert, and John Edward of Solsgirth, praying their Lordships to appoint the books of bonds, debentures, and merchants' entries kept by Mr Grossett, late collector at Alloa, from the year 1728 to the year 1743, to be laid before their Lordships, and desired us to give orders for the said books to be produced in court by the beginning of next term. We direct you to send the said books to us by express, sealed up against the 3d of November next, which is the first day of the term, with a particular list of them in progressive numbers. We are, &c.

*(A. Legard,
Signed (R. Somers,
(M. Cardonnel.*

To Collector and Comptroller"

Editorial note: Our thanks are due to Mr Jim Sharp of Kincardine on Forth who found these articles in the course of his researches and passed them on to us with permission to use extracts for publication in the Forth Naturalist and Historian. These extracts have been assembled in chronological order to make more sense to the reader.

Report of the *Forth Naturalist & Historian* 'Man and the Landscape'
Symposium Saturday November 13th 2010

Trees, Woods and People

Several exciting developments, both in our understanding of the human history of woods and their future in the Forth Valley, made 2010 a significant year for the *Forth Naturalist & Historian* to focus in its 36th annual symposium on woodland history, ecology, conservation and restoration in future decades.

Christopher Smout (St. Andrews University) is the leading environmental historian in Scotland, and woodland history is his particular specialism in several major works, including in 2003, *People and Woods in Scotland. A History*, and in 2005, *A History of the Native Woodlands of Scotland, 1500-1920*, with Alan R. MacDonald and Fiona Watson, both published by Edinburgh University Press.

Professor Smout opened the symposium, speaking to the title, *Learning to Love Them: Changing Attitudes over the Centuries to Trees and Woods*. Professor Smout in fact argued that people in Scotland did not have to learn to love their woods: regard for them has been a constant theme over at least the last c. 500 years. When first recorded, woodlands and forests were seen as 'fair' and 'beautiful', regarded with warmth and familiarity rather than fear or hostility. This view might be traced to the profound regard for nature (animism) of the Gaelic world, with its way of embellishing different tree genera with human characters, passed down to us from Irish traditions. This is not to deny an intimate knowledge of the economic value of trees and woods or the innumerable uses to which wood was put by all social classes, from construction to tan-bark, coppicing for charcoal and simply the conservation of woods for sheltering livestock.

The uses of woods began to be contested in the 18th century. Woods gained value for timber by landowners and tenant access for fuel began to be denied. But the romanticism that acted as counterpoint to this new hard-edged world also encouraged new planting of trees simply for their beauty and aesthetic value. Wordsworthian respect was the natural precursor to the more ordered sense of landscape promoted in the early 19th century by authors such as Gilpin, and later Ruskin, who viewed utility with hostility. Contemporaries of Ruskin shifted focus also, from woods to trees, with the rise of arboreta and the extraordinary journeys of the Victorian plant hunters. This fascination with novelty faded in the early 20th century, particularly as the new science of ecology asked us to re-evaluate our own woodland heritage. Tensions between conservation and afforestation built, but from World War II, but with the advent in the First World of a post-industrial society has come a more nuanced, multi-layered appreciation of the value of woods to our health, leisure and

well-being. We may not have rediscovered Gaelic sensibilities, but we have perhaps reached a new balance between economy and ecology.

Coralie Mills is a dendro-chronologist and Honorary Fellow at St. Andrews University. For the last few years she has worked with **Peter Quelch**, a woodland ecologist, and **Mairi Stewart**, a historian, in reconstructing the *Woodland History around the Bealach nam Bo, the 'Pass of the Cattle', above Loch Katrine*.

The project was undertaken for the Forestry Commission, to further plans to restore woodland and conserve biodiversity, and working closely with the Great Trossachs Forest Project: a summary is accessible on (www.dendrochronicle.co.uk). The study area is on the southern shore of Loch Katrine, off the beaten track, though readily viewed from the SS Walter Scott steamship. Early documents from the late 14th C record a royal hunting forest, Glen Finglas, and this declined only from the late 17th C, a time of general decline in Scottish Hunting Forests. By In AD1669 timber had overtaken hunting interests. There were also farms within the forest, though, with estate documents indicating livestock production and dairying: rents were paid in cheese.

The hills here have extensive wood pastures, areas used to support animals as well as maintain trees for economic use. A difference existed between the forest, which was out of bounds, and the wood pasture which was an accepted part of a farm's resources. The woods are of oak and ash, with oak pasture having widespread archaeological remains of settlements, agriculture and woodland use. Analysing tree rings from ash trees demonstrated cyclic patterns of growth reduction and recovery in the 18th C, probably from pollarding on a 10-12 year cycle for fodder, poles and fuel at the adjacent pre-improvement farm. Over the *bealach* is open oak wood pasture, with squat, low, burry oaks with birch, alder and crab apple. The oaks were not pollarded, although their shapes suggest they had been coppiced early on, and they survived the arrival of large sheep flocks, perhaps protected by a substantial stone-faced dyke. Bark for tanning was the most important product of coppiced trees, with charcoal for the burgeoning iron industry.

The project has shown the history of a wooded cultural landscape where people lived and worked, where hunting, farming and woodland use co-existed for many centuries. These uses helped shape the biodiversity and landscape that is valued today. The challenge now is how to manage and conserve these qualities when traditional land management has long elapsed and the people gone.

Syd House, Conservator for the Forestry Commission Perth and Argyll Conservancy explored the role of *State Intervention in Forestry* – the ever-changing role of the Forestry Commission in Scotland's rural scene from 1919 to the present day. After World War I, Scotland had around 4% woodland cover, the lowest in Europe. Imports, principally from Russia, fed timber

requirements. Tree planting was by enthusiasts and through bodies such as the Royal Scottish Forestry Society. But World War I was the stimulant to establish new woodlands, with the Acland Report of 1917 recommending state intervention in the need to secure a timber reserve in time of war. Afforestation was seen as a way to increase productivity and population in 'waste' lands.

The Forestry Commission was formed in 1919, with the earliest plantings in Moray, the Great Glen and Wester Ross, science-led, matching softwood species to site properties and using mainly Norway spruce, Scots pine and European larch. Poorer and wetter ground demanded ploughing, draining and fertilising, suited to Sitka spruce. Significant complaints about the predominance of conifers emerged before World War II, mainly in England, and a demand for greater access to the countryside led to National Forest Parks, the first Argyll Forest Park, established in 1935.

The new forests were too immature to contribute to war effort, and timber shortages re-emphasised the need to maintain afforestation after World War II. The Forestry Act of 1945 made the Forestry Commission answerable to a Government Minister. Despite grants for private forestry targeted mainly at restocking felled woods, private forestry proceeded only slowly, and the Forestry Commission was again the main driver, and with competing interests for the land from farming, forestry was more confined poorer ground. In 1949 some 6.5 % of Great Britain was covered in trees, with 545,000 ha in Scotland, compared to 400,000 ha in 1919.

The 1957 Zuckerman Report emphasised the economic and social benefits to the country, and further emphasis on Sitka spruce. Rapid expansion was driven by targets such as 15000 ha planted per year for 1969 and 20000 ha per year in 1976. Almost all new woods were coniferous, with new industries developed such as the Corpach pulp mill and forest villages constructed for workers. At the same time due regard was given to wildlife and woodland conservation, and the beauty of the countryside stressed by the appointment in 1964 of a landscape architect in 1964, and public access granted to all Forestry Commission forests was followed by visitor facilities from the 1970s (the David Marshall Lodge was opened in 1960).

The removal of tax incentives for planting trees in 1988 indicated that public benefits rather than simply timber production should be a goal. A policy of planting broadleaved trees was introduced driven by environmental, and later social, objectives that led to the managing of woodlands for habitat, access and landscape enhancement as well as community engagement. By 2005 there was 17 % woodland cover, 10,000 people employed, 10,000 ha of new woodland planted per year and 8,000 ha replacing felled trees, contributing around 5 million tonnes of timber harvested per year. The Forestry Commission had become the largest provider of outdoor recreation facilities in Scotland, being awarded a World Wide Fund for Nature's 'Gift of the Earth' in 2001, the first state forest service in the world to receive this. And the future?

The vision is that Scotland will be renowned as a land of fine trees, woods and forests which strengthen the natural environment and which people enjoy and value.

Ancient trees or 'veterans' are today valued for their rarity and their romanticism as well as their antiquity. **Edward Parker** is Project Manager of the *Ancient Tree Hunt* for the Woodland Trust, working with the Ancient Tree Forum and the Tree Register of the British Isles, with support from The Heritage Lottery Fund and the Esmee Fairbairn Foundation. Scottish Natural Heritage is a partner in Scotland.

The UK is one of the richest parts of the world for ancient trees. Many have historical associations. Some might link the present day with the original wildwood. All carry messages about conservation and diversity into the future. 'Ancient' trees are described as being in their third and final stage of life, of great interest biologically because of the complex ecosystems they support as well as aesthetically and culturally. 'Veterans' are mature trees, in their second stage, and 'notable' trees of local importance or of personal significance, the next generation of 'veterans'. Ancient trees survive in former Royal forests, as trees used in the past to mark boundaries, on common land, in 18th century parkland and in churchyards where they are revered. The Fortingall Yew on Tayside, for example, is perhaps 5,000 years old, believed to be the oldest tree in the British Isles, maybe the oldest living thing in Europe.

The project began in 2006, with the aim of ensuring as many ancient trees as possible will survive for as long as possible, with the main objectives being to record 100,000 'veteran' and 'notable' trees by 2011, when the project ends. The main activity is finding out where ancient trees are, mapping their survival, with the help of the public. The project has already recorded 65,000 such trees, 4 years into the project, and the public are encouraged to record trees they know of but which might otherwise go un-recorded, and record visits to trees already known (www.ancienttreehunt.org.uk). For each tree, the location, species, girth, form or shape are recorded, dead wood in the crown and on the ground, and the holes and hollows that are typical of such trees and which support components of the intricate ecosystem that characterise these trees; their fungi, invertebrate fauna, epiphytes and parasites and bats. Training events are organised in the collection of these data. A comprehensive map will help make the public more aware of these trees and their significance and beauty, allow monitoring of current threats and future losses, provide evidence for their greater protection, plan how best to conserve them and campaign to ensure that trees in the countryside can become the 'ancestors' of the future.

Simon Rennie is Project Manager for the Central Scotland Green Network, and considered the need for and the value of the major new initiative, the *Central Scotland Green Network and Ecological Corridors* (www.centralscotlandgreennetwork.org). Initiated in 2009, this is a major governmental National Planning Framework 2 programme, the only project to relate directly to improving the environment. All relevant national and local governmental have come together

in a long-term vision for central Scotland, including the Forth Valley, over the next 20 years. Goals have been set for 2030: to ensure every home in central Scotland is within 300 m of an attractive, safe and well-maintained green space or accessible countryside; to improve the green infrastructure; develop a high-quality environment for business, with derelict land being made-over; create a three-fold increase in community allotments, gardens and orchards; increase by 50 % the woodland cover; generate an integrated habitat network providing corridors for wildlife; make green space accessible to all; providing a community resource, improving health and well-being, enhance the nature and landscape of central Scotland and help mitigate climate change.

The initiative is responding to the need for a step-change in environmental quality in a region typified by historically high levels of social deprivation. 19th century coal mining left a derelict, devastated region. Trees and woods nevertheless make up 12 % of the land in the Central Region, though much grows uncared for on waste land. One aim of the project is to achieve a 50 % increase in woodland cover, to 24 %. In addition to enhancing environmental quality for residents, there is a need to enhance the biodiversity value of the region, and to absorb or sequester CO² in mitigating for 'global warming'. Ecological corridors provide much more, though. Strategic tree planting will link together the denuded, fragmented landscapes of today, providing routes for migration of animals and herbs, ensuring the mixing of otherwise isolated populations and the survival of genetic diversity.

The Science of Woodland Restoration and the application of genetics to future woodlands in particular were highlighted by **Cecile Bacles** of Stirling University. Cecile described her work at the new native wood of Carrifrans in Moffat Dale in the Southern Uplands (see Ashmole, M. and Ashmole, P. 2009. *The Carrifran Wildwood Story*. Jedburgh: Borders Forest Trust). The mission statement of the Carrifrans Project is to re-create in the Southern Uplands of Scotland an extensive tract of mainly forested wilderness, with most of the rich diversity of native species present in the area before human activities became dominant. Around the world ecologists are developing techniques to restore degraded and exploited ecosystems in restoration ecology, linking the past with present day interventions and to the future, ensuring the sustainability of interventions. The need is to create a dynamic and expanding woodland resource which has the capacity to evolve in the future and respond to evolutionary changes. It is the genetic resource of tree populations that must provide this resilience, through planting of locally collected seed and allowing only natural, not human-aided regeneration.

The science of population genetics is a detective story. A seed is formed usually from two parents. A DNA profile can be extracted from the seed. The seed falls close to its parent and neighbouring trees, but the other parent that supplied the fertilizing pollen is not necessarily one of these. To identify potential parents and potential parent-pairs for a given offspring seed there is the need to locate all potential trees. To find the parent-pairs of ash trees

(*Fraxinus excelsior*) at Carrifrans, the DNA profiles of 150 mature trees were extracted from five separate forest remnants of varying size and isolation. From these the genetic compatibility between offspring and potential parents could be found. Some parent trees grew many kilometres from their seeds at Carrifran, because in such an open landscape, wind dispersal allows pollen to travel a long way, and although far apart, ash forest remnants can be genetically connected and genetically diverse, so that genetic diversity can be maintained in future generations. Restoration must maintain this natural connectivity. The maintenance of this diversity is critical for the future, because only by mixing the DNA of parents tolerating different soil and climatic conditions can new trees evolve to meet a changing environment.

The future of forest restoration in the Forth Valley was outlined by **Liz Shortall**, now Development Officer for the Forestry Commission in Scotland, but until recently the Project Manager for one of Europe's most exciting forest restoration programmes, *The Great Trossachs Forest* (www.scottishforestalliance.org.uk). This involves all the major woodland conservation bodies in Scotland, The Woodland Trust, the RSPB and the FCS, supported by British Petroleum: no wonder that Ms. Shortall subtitled her talk, '*Why Working Together Achieves So Much More*'. One of the partners working together in the Great Trossachs Forest, the RSPB, was represented by **Fraser Lamont**, Site Manager at the Inversnaid Reserve, who outlined the work undertaken to re-afforest with native trees Inversnaid and the adjacent Garrison Estate, *From Loch side to Mountain Top*.

The vision of the Forest Alliance is truly far-reaching, some 200 years into the future. The needs are pressing, the trees planted to conserve and enhance biodiversity and make a major contribution to absorbing and locking away carbon. This process, sequestration, is predicted to capture 377,830 tonnes of carbon or the equivalent of nearly 1.4 million tonnes of CO² in the first 100 years of the project.

The forest covers an area of 16,650 hectares of plantation forestry and rough pasture, converting to a more natural mix of habitats, with moorland, montane scrub, wetland and pasture the land east of Loch Lomond from Inversnaid to Loch Katrine and Glen Finglas. At Inversnaid there are 450 ha, across which 16,000 trees are established or planted. In 200 years the plan is for more than half of this (some 250 ha) to support 125,000 trees. At Inversnaid and Garrison the estates together are home to many characteristic birds, redstarts with eleven calling birds when last monitored in 2007, pied fly-catchers, black grouse, the rare twite, and the territories of two golden eagles include the reserves. Woodland restoration sometimes creates tensions between divergent conservation needs. The complex habitat demands of black grouse are typical. They need open ground for leks, wet areas and mires for insect food and woodland to shelter in winter. The estates are also managed to support highland cattle and more than 1000 sheep, and pressures exerted by these livestock have an impact on forest restoration plans. Conventional tree

exclosures, surrounded by fences to keep livestock from seedlings, are harmful to many birds, particularly low-flying black grouse, but attempts to establish seedlings without erecting fences has failed. With forest restoration having a higher profile, solutions to this problem has led to the erection of fences which are made more visible to birds by vertical struts.

Further east the land around Loch Katrine, 900 ha are home at the moment to 300,000 trees but 800 ha will support 1,183,000 trees in the year 2200, and in Glen Finglas, more than 1 million trees across half the 2110 ha.

Richard Tipping

BOOK REVIEWS

Rebirth of a Palace. The Royal Court at Stirling Castle by John G. Harrison (2011). Edinburgh: Historic Scotland. ISBN 978 1 84917 055 0. £22.95.

This sumptuous, richly illustrated book is a celebration of the ten year effort, led by Historic Scotland, to interpret in stone, wood, fabric, costume and jewellery the Royal Scottish Court at Stirling, the palace within the castle as it was in 1549. It is written by one of our most eminent local historians, John Harrison, who himself was engaged over the decade of the work and the translation of archival details into the real 'world' that we can now be a part of. As we learn in this book, the palace we see is an interpretation more than a reconstruction. It is an evocation of a particular spirit and a precise time in history as well as a stunning tourist attraction.

The palace is a complex of eight rooms. Four are for the King, James V; three for his Queen, Mary of Guise. The two bedchambers were side by side but with access controlled by Mary! In the middle was an inner courtyard, the 'Lion's Den', though there is no evidence that this was the predecessor to Blair Drummond. One of the guiding principles of the project has been that everything we see has been deeply researched: *there is a rationale for the inclusion of every feature and artefact* (page 32). This attention to detail can be seen in the reasons for 1549 to be that one point in time. Though James V ordered the building of the palace in 1538, and some work was underway in that year, his death on Solway Moss in December 1542 means he may not have seen its completion. The palace in 1549 represents the complete work. But without a King, his chambers are presented more starkly than those of his widow.

Rebirth of a Palace is as much a story of the conservation and re-presentation to the public as it is a history, presented in seven wonderfully informative chapters over 165 pages with beautiful colour illustrations on almost every page. We learn the background to James' vision in Chapter 1. James was no marginal monarch: he was deeply receptive to continental ideas and images. His first young wife was the daughter of the French king; his second, Mary of Guise, almost as well-connected. James could build with *magnificence hitherto unseen in Scotland* (p. 16), "telling the world that he understood what being a Renaissance king on a European model was about" (p. 22). In Chapter 2 we learn how the palace survived, through James VI becoming James I of England, and the slow decay that ensued but which led in 2001 to the £12 million rebuilding. Subsequent chapters describe the architecture of the building, its statuary and interpretations of the many sculptures, the furniture and furnishings of the rooms, the tapestries and carpets and the costumes and jewellery recreated for today's guides and interpreters. We meet the conservationists who were engaged on the project, the heraldic expert, the stoneworker, painters, embroiderers, painters and furniture-makers, though not the candle-stick makers, although the candle sticks themselves are included, as too is the conspicuous consumption of candles in the Royal household. Embedded in the writing are little illustrations like this, which emphasise the role that theatre and display played in the Royal household, even in where doors in the rooms were placed to maximise the obeisance and deference of the Court to the monarch. The text has a deft, light touch. You learn effortlessly. Throughout there are lovely and often surprising observations: carpets were too expensive to have most people walk on them; the king gave used clothes away to his courtiers; Scots greyhounds were among the most highly prized hunting dogs.

And then there are the Stirling heads, reserved for the final chapter. Thirty four survive in some form from a total that might have exceeded 45. Oak for the heads was sourced in modern-day Poland from trees cut in 1539, but the wood may have been re-used from barrels rather than especially commissioned. Nevertheless they were an

extravagance, even for a king, and all about display and dynasty. The replica heads we see, also carved in solid oak, were painted after their installation on the ceiling: a touch of the Sistine Chapel. Many of the heads are photographed in this volume, with several presented as whole-page illustrations. They are superb. So is this book, a rich tapestry in its own way.

Richard Tipping

A History of Stirling in 100 Objects by Elspeth King (2011). Stroud: The History Press. ISBN 978 0 7524 5932 5. £12.99

Elspeth King will be familiar to many as the Director of the Stirling Smith Art Gallery and Museum. Some of the objects in this book have appeared as weekly instalments in the Stirling Story in the *Stirling Observer*, but here they are brought together in a celebration of the city. Inspired by the collaboration between the British Museum and the BBC Radio series, *A History of the World in 100 Objects*, Elspeth presents her own history of Stirling in this delightful pocket-sized little red book. In the deservedly warm introduction, Councillor O'Brien, Provost from 2003-2007, explains the purpose of the book to be a history of Stirling seen largely through the collection housed in 'The Stirling Smith'. This is no straightforward academic history, then. What define Stirling here are the artefacts people have made over the centuries. These give insights that are more tangible, more intimate and more individual than a history based on documents. Everywhere is different to everywhere else, and should be.

The core of the book is in six chapters laid out in chronological order. Each page relates a story about or around an object. The objects are diverse, from footballs to jewels, carvings to lino-cuts, paintings and sculpture. Every object is illustrated, and the two photographers, Michael McGinnes and Silvia Anestikova of the Museum, have provided exquisite illustrations to Elspeth's text. Of the 100 objects, 55 are illustrated in colour. The book begins with Medieval Stirling, which is a little disconcerting when objects and artefacts are among the few sources from which to understand the period before history. Chapters follow on to the Renaissance, here reckoned to be the 16th and 17th centuries, the 18th, 19th and 20th centuries, the last incorporating the first decade of the 21st century, with the most recent object a sketch of Judy Murray, mother of Andy and Jamie, in 2008. With one page to an object, there are 17 from the 300 years of the Medieval period, 12 from the 16th and 17th centuries, 9 from the 18th centuries, and 62 from the last 200 and a bit years.

The real delight, to me, was the wonderfully imaginative way in which the illustrations allow the mischievously skittish text to flow across the centuries, making connections only someone steeped in Stirling's story could find, weaving a delightful temporal tapestry. As examples, the first illustration relates to Alexander II awarding a market to the royal burgh in 1226 but the illustration is the early 20th century stained glass window from the Municipal Buildings, and the essay links the monarchies of Alexander II to George V. Bannockburn is illustrated across two pages but the first is a 1930s cigarette card and we learn about Stephen Mitchell's tobacco company and his daily journey to work from Boquhan to Glasgow. I started to conscientiously read the book in order, as a history, but the real pleasure, I found, is in just dipping into it almost randomly. Each story is self-contained though the sequential writing for the *Stirling Observer* means some information is repeated here on occasions. As a history it is quirky, deliberately so, and fun. You absorb the information almost without knowing, by a form almost of osmosis. And at the end you stand back, and like looking at a tapestry, you can't see the threads but you can see the picture, and this tapestry is delightful to behold.

Richard Tipping

AN INTRODUCTION TO THE TROSSACHS LANDSCAPE HISTORY NETWORK

At a recent public meeting in Callander, various individuals came together for the start of a new community-generated network. There was a positive and creative beginning for the local initiative, which brings together diverse individuals, groups and organisations to explore the area's past.

The network is independent of any institution and is organised by volunteers. Through it, people of different ages, interests and backgrounds can collaborate on activities relating to archaeology, history, ecology, or anything else to do with the local landscape and its heritage. There are a number of local history groups already active in and around the Trossachs and a number of other organisations whose work relates in one way or another to the landscape. There are also many people pursuing an interest in local history on an individual basis. The network will not duplicate this but generate new projects which will bring individuals, groups and organisations together to achieve things which might not otherwise happen.

This is about more than the past. The focus is the local landscape, local history and so on, but it is looking to achieve other things as well. The network will provide opportunities for everyone to learn something new, for children and young people to explore the landscape, and for those involved to pursue creative interests (e.g. photography, sketching, creative writing, film making). The network will provide new opportunities for getting out-of-doors and seeing how the past connects with the present.

Anyone with an interest is welcome to join irrespective of age or background and there are no joining fees. You can join as an individual or as a representative of a group or organisation. Whether you currently know little about the local past or have been active in local history for some time, the network could be for you. Each will concentrate on those activities and projects which fit with their interests and the time available.

Following on from the enthusiastic first meeting one or two initial events have been organised, including guided walks and training sessions in archaeology, history and other ways of investigating the past. The meeting generated a number of ideas for more ambitious projects, and these will be taken forward as the network gets off the ground.

If you are interested in finding out more and in getting involved, visit the network's website (www.trossachslandscape.org.uk) where you will find a summary of the first meeting, or contact Chris Dalglish (chris@trossachslandscape.org.uk; 01877 389366).

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Naturalist
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