



GLASGOW NATURAL HISTORY SOCIETY NEWSLETTER

February 2016

**David Palmar
(Newsletter Editor)**

**Next Newsletter Deadline
22 March 2016**

**GNHS is a Registered
Scottish Charity
www.gnhs.org.uk**

2016 MEETINGS – In the GU Boyd Orr Building unless otherwise stated

February

Tuesday 9th

7.15pm Photographic Night:

Members' digital slide shows followed by the show of entries and presentation of prizes from the Photographic Competition (see next article).

March

Thursday 3rd

6.00pm Graham Kerr Building Lecture Theatre 1

Glasgow University Expeditions Report Back. Jointly with GU Exploration Society (most expeditions are supported by the BLB Bequest).

Tuesday 8th

6.30pm Lecture: Farming with wildlife; Andrew Parsons

Tuesday 15th

6.30pm Lecture: Close-up photography of nature: from phone-camera to microscope lens

(Goodfellow Lecture); Steve Campbell

7:30pm: AGM

April

Tuesday 12th

6.30pm Lecture: Glasgow's biodiversity: it's second nature; Dave Garner

7.30pm Lecture: The state of the apes; Liz Williamson

May

Tuesday 10th

6.30pm Tutorial: Scottish ants; Jeanne Robinson

7.30pm Lecture: Scotland's deep seas and their future in a changing ocean; Murray Roberts. (Jointly with Hamilton NHS and Paisley NHS)

June

Tuesday 14th

Summer Social: see April Newsletter for details.

Members' Photographic Night and Photography Competition Results

David Palmar

On Tuesday 9th February in the Boyd Orr Building we will again have members' own digital presentations. There is still space in the programme, so please let me know in advance if you would like to present a slide show, and what the subject is, to enable me to organise the evening more effectively. Even just a few slides and a few words about each can be interesting for members – sophisticated presentations are nice, but unnecessary – and not longer than 10 minutes, please!

This will be followed by the results of the Photographic Competition which is now in its 5th year, and is run jointly by GNHS and the Institute of Biodiversity, Animal Health and Comparative Medicine.

This year there have been 65 entries from 17 people, up from last year's 49 entries from 14 people. Anyone who submitted an entry is encouraged to attend.

Summer Excursion Programme

Alison Moss

The summer excursions are being discussed and planned just now. We have some good ideas with various leaders volunteering. Amongst probable destinations are Cambusnethan Woods, RSPB Loch Lomond, RSPB Lochwinnoch Bioblitz, Loch Katrine, Uddingston, Overtoun or Uplawmoor, Kelvingrove Park, Argaty Red Kites, Dalzell Estate and Baron's Haugh, Neilston, and fungal forays. However, suggestions would be very welcome. Please also make any views you have about best days, time and length etc. It's good to cater for as many members as possible, so just contact me, or George Paterson.

2015 Subscriptions

Richard Weddle

Subscriptions fell due on 1st January 2016 (except for those who have joined since the start of the winter session). A subscription renewal form is enclosed for those who don't pay by Standing Order; email recipients will receive a separate reminder by email. We would be grateful if you could pay your subscription as soon as possible, to save us having to send further reminders. Remember that if you pay by the end of January you may deduct £1.

GNHS/BRISC bursaries

As in previous years, GNHS and BRISC (Biological Recording in Scotland) are offering bursaries towards attending a training course in natural history field studies skills. The bursaries will be for £200 or 75% of the cost of the course, whichever is lower. This year there will be seven bursaries available; the closing date for applications is 31 January 2016; for full details, and an application form, see www.brisec.org.uk/Bursaries.php

Commonwealth Compass unveiled by Glasgow Tree Lovers' Society – 30 November 2015

Bob Gray

As part of the continuing legacy of the Glasgow 2014 Commonwealth Games and to celebrate Glasgow Green's twinning with the Americas, a Commonwealth compass landscape feature has been created at the Dassie Green, within the park.

Conceived by the Glasgow Tree Lovers' Society and created in collaboration with Glasgow City Council, with the support of the Big Lottery Fund and the Craignish Trust, the project represents the coming together of the 70 nations and territories of the commonwealth.

A granite feature, representing a compass, has been laid out on the ground, and trees chosen for the centre of the compass, and towards each of the four cardinal points, represent countries from the north, south, east and west of the world with Glasgow at the hub.

4 Douglas fir trees in the centre recall David Douglas from Scone, one of the most famous plant hunters of all time. He developed his botanical skills from 1820-1823 in Glasgow's Botanic Gardens. 3 Scots pine, Scotland's national tree, to the north, represents the ten Commonwealth countries from Europe while 3 Wollemi pine to the south represent the 31 Commonwealth countries from Africa and Oceania. 3 Deodar cedar to the east represent Asia's eight Commonwealth countries and the 21 countries from the Americas and Caribbean are represented by 3 Nootka cypress to the west of the compass. All the trees selected for the feature are evergreen meaning that they will provide year round interest and act as a rich backdrop for more seasonal plants within Glasgow Green.



Local schools present at the opening were Blackfriars and St. Francis Primaries.

Councillor Graham OBE, who helped deliver the Games to Glasgow, said: "It is fantastic that the Glasgow Tree Lovers' Society moved this project forward and set about breathing new life into what was a slightly overlooked bit of Glasgow Green. One of the best things about the Commonwealth Compass is that it can be enjoyed by people all year round and serves as a point of interest and education within the park. It will be lovely to see how these trees grow and develop over the coming years."

Bob Gray, Honorary Treasurer of Glasgow Tree Lovers' Society, said: "This Commonwealth Compass project links the present with both the past and the future. The path connects Glasgow's Time Spiral history from 10,000 years ago with the legacy of the Commonwealth Games which this project represents.

"The different, unusual conifers used in the planting will enrich Glasgow's biodiversity for many years to come - Glasgow's clean air allows the growth of these evergreen trees in a way that would have been impossible years ago owing to industrial pollution."



Councillor Archie Graham and Calton councillor George Redmond with two local youngsters

Glasgow Tree Lovers' Society were also involved in another Commonwealth project to create an online trail guide to sixty of the city's most interesting, beautiful, historic and exotic trees. The guide includes details of the trees' common and botanical name, origin and heritage as well as a little bit about their value and significance to our arboreal collection. An accompanying map also shows where the trees are located in parks around the city. The final guide of 60 specimens, available online at

www.glasgow.gov.uk/commonwealthtrees was drawn up from nominations

received from schools, community groups, public and a newspaper competition to promote and celebrate the discernible beauty of some of the rarest, unusual and native and exotic tree specimens contained within Glasgow's parks.

Photos by David Palmar of www.photoscot.co.uk

Discovery in Kelvingrove Park

Bob Gray

At the RSPB's 'Bioblitz' in Kelvingrove Park (26/7/15), when Keith Watson, co-author of 'The Changing Flora of Glasgow' and Curator of Botany at Glasgow Museums, heard that the narrow-leaved ash trees south of the Prince of Wales bridge were producing fertile offspring (see item about our visit in the NL of August 2015), he took himself off and pronounced on his return that he had found naturally regenerated seedlings on the west side of the bridge – a first for Glasgow.

Next Newsletter - copy to David Palmar by 22nd March 2016 please.

Thank you very much to all the contributors who have made the Newsletters so interesting and worthwhile publishing. Please send contributions by email, preferably as .rtf, .doc or .docx (Word 2007) format. If you have time, please italicise taxonomic names, and use Verdana font, size 12 points.

If sending photos, please submit only a few as separate jpg files (not as part of a Word document), and make them under 100Kb each for emailing).

A study of nesting Common Scoter (*Melanitta nigra*) in the Flow Country, Scotland - sabbatical project, 2015

Elisabeth & Tom Charman

The UK supports a small breeding population of Common Scoter, restricted to the Flow Country of Caithness and Sutherland, and a small number of large lochs in Inverness-shire, Perthshire and Islay. Over the last twenty years this population has suffered a significant decline, falling from 95 pairs in 1995 to 52 pairs in 2007. Monitoring in the Flows suggests that the decline continues, with 20 females in 2013, from 26 in 2007 and 36 in 1995. The species is red listed in Birds of Conservation Concern 4 due to a 63% decline and a very small population size. Causes of decline are not well understood. This project aimed to fill gaps in our understanding of scoter breeding ecology through detailed observations of females during incubation and the use of camera traps.

The project aims were:

- 1) To locate Common Scoters in May and June.
- 2) To find a method of direct observation at a site without causing disturbance to nesting birds.
- 3) To gather data on foraging activity during the incubation period (location, timing, intensity) through direct observations.
- 4) To use camera traps on lochs to record scoter diurnal activity.
- 5) To make assessments of the practical use of camera traps to monitor Common Scoter activity in the breeding season.
- 6) To establish incubation patterns by observing females on incubation recesses.
- 7) To attempt to locate nest sites by watching females back from incubation recesses.
- 8) If nesting sites are found:
 - determine breeding success.
 - use nest cameras or temperature loggers to record incubation patterns and the timing, and if possible, causes of nest failure.
- 9) To trial the above methods and make recommendations for future work

The study was carried out from 30th May – 5th July 2015 at RSPB Forsinard in The Flow Country. Study areas had regular scoter records from the past few years and broods had also been recorded in the recent past, indicating that they were probably breeding lochs.

Once females were located, regular timed watches were carried out from suitable vantage points. We watched in blocks, spread across early morning to evening. During watches, the location and activity of any scoter was recorded (mapped) at 5 minutes intervals. If scoters were observed leaving or arriving at a loch we recorded the flight lines and directions.

Direct observations provided the following:

- Males were present in the study area until at least the 20th June (males leave breeding grounds once the female is nesting).
- Females were often accompanied by another female(s)
- Scoters were present on lochs for very long periods of time (max 11:15 hours), indicating that breeding was possibly not taking place.

We used camera traps to supplement data collection. Camera traps are only triggered by activity relatively close to the trap, but scoters can be identified at ranges further than this triggering range. We therefore set the traps to record an image every 1 minute (between 04:00 and 22:00), to record the pattern of loch use. We deployed 10 camera traps (Fig. 1).



Fig. 1. Example camera trap *in situ*

Although traps should have been able to run for about a week, we checked each after 3-4 days. 45 camera trap runs were collected. In total, camera traps took 75,245 images (Fig.2.). Scoters were captured on a minimum of 1,268 occasions (minimum due to uncertainty of duck identity at long distances). The mean capture rate was around 2% of all images with a maximum of 19%. However, of 45 camera runs, 28 featured errors with the equipment. Errors included periods of time skipped, failure to restart and resetting to factory settings.

Even when cameras were working well, there were some limitations:

- Poor weather could result in bad visibility and rough water on lochs, making identification difficult.
- Ducks were often too far away to confirm their identity.
- Viewshed was limited so entire lochs could not be observed simultaneously without placing several cameras on 1 loch.

In summary, camera trap data provided the following:

- Males were present in the study area until at least the 25th June.
- Groups of scoters formed – 2, 3 or 4. Groups of 3 and 4 were never seen through direct observations.
- Scoters were present on lochs for long periods of time, indicating that breeding may not have been taking place or had failed early.

Although no nests were located we have collated a great deal of information which will be used by RSPB research and Reserve staff in subsequent years. No one has spent such a concentrated time trying to locate Common Scoter nests in the Flows in recent years so our experiences are valuable as a pilot trialling methods for subsequent work.

Project Successes

- Observations of scoters on potential breeding lochs
- Trialling camera traps as a method of recording scoter activity.
- Quantification of the amount of time necessary to observe scoters to try and establish breeding status.
- Information on male and female behaviours and interactions.

Project challenges

- Low numbers of scoters due to declining numbers
- Very poor weather – cold, wet and windy, which may have delayed/stalled scoter activity.
- Suitable vantage points in a flat landscape
- Remoteness of study area – long distances to drive to access lochs and then long walks in, in some cases.
- Accessibility – rough forestry tracks – 4WD essential for most sites.
- Camera trap failures
- Time needed to deploy camera traps distracted from other observations
- Apparent lack of breeding on focal lochs



We are very grateful to Glasgow Natural History Society, the Scottish Ornithologists' Club and RSPB for generous funding towards the project. Grant money was spent on travel to the study area, accommodation for five weeks and use of a 4WD to access remote sites.

The University of Glasgow Exploration Society - The Remote Scotland Expedition 2015, Islay

Progress Report October 2015

This document details the on-going progress of the results analysis following on from the data collection which took place during the summer expedition to Islay.



An Investigation into Haul-out Behaviour of Harbour Seals (*Phoca vitulina*):

A total of 37 observations, at 150 minutes each, were carried out throughout June and July 2015, along with the recording of 40 days of time lapse footage. The time lapse footage recorded a photograph of the haul-out every minute, generating approximately 57,600 images. The images were cropped and run together as films

for each day to create a census of the Harbour Seal population at Bunnahabhain Bay and to gain further insight into the behaviour of the population. A high level of site fidelity was shown throughout the project, with several individuals returning to the haul-out over several observations in different tidal cycles. This was particularly evident from lactating females caring for pups. There were 38 individual Harbour seals noted and the appearance of 3 female Grey seals on the Harbour seal haul-out during the study.

Vigilance behaviour was more evident when fewer seals were present on the haul-out and was displayed regularly from new mothers. There was an increase in vigilance behaviour during disturbance events, such as from speed boats, often causing seals to leave the haul-out into the water.

Harbour seals were generally found to arrive and depart separately, with the exception of mothers and pups. The seals quickly departed together in the event of a disturbance event. Several seals arrived within minutes of each other at certain times of the day, possibly due to factors such as food availability and weather conditions. There were fewer seals on the haul-out on dull or wet days compared to days with warmer weather. More seals were found on the haul-out at low tide compared to intermediate tide and more seals were found to be present on the haul-out for one week compared to the next.

An Investigation into the Habitat Use of Bats (*Chiroptera spp.*):

In total, 652 bat passes were detected during 14 hours and 7 minutes of surveys in 7 of the 12 studied sites. Habitat type was found to significantly affect bat activity (GLM: $F_{1, 36} = 37.23$, $p = <0.001$). Activity was found in broadleaf woodland, arable farmland and small town habitats with no bat passes detected in open water areas, which was unexpected. The highest levels of activity were recorded in broadleaf woodland margin with an average of 2.91 bat passes per minute. Lower levels of activity were recorded in small towns and arable farmland with averages of 0.19 and 0.11 bat passes per minute, respectively. Out of the 652 bat passes recorded, 97% were identified to species level. A total of five species were found present: *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Myotis daubentonii*, *Myotis nattereri* and *Plecotus auritus*. Habitat type was shown to significantly affect the diversity of species (GLM: $F_{3, 32} = 27.9$, $p = <0.01$). Broadleaf woodland was found to be the most diverse habitat type where all five species were recorded. Arable farmland and small habitats both had two species present: *Pipistrellus pipistrellus* and *Pipistrellus pygmaeus*. Wind, temperature, precipitation and lunar phase had no significant effects on bat activity.

The Effect of Anti-Parasitic Drug "Rycoben" on the Invertebrate Colonisation of Sheep Dung:

This study was a manipulative experiment looking at the invertebrate colonisation of sheep dung over a span of four weeks. Sheep dung samples were taken from fields containing sheep that had recently been treated with Rycoben, a pour on anti-helminth spot on treatment, and from sheep having received no anti-parasitic treatment in the past 5 months. They were then standardised and left for 1, 2 or 4 weeks and the natural invertebrate colonisation was observed, the invertebrates found in the samples preserved. The invertebrates are now all being identified in the lab at the University of Glasgow to see if there are any differences in the treated and non-treated samples. The active ingredient in Rycoben is

ricobendazole of the chemical class benzimidazole. Much research has been carried out on how Benzimidazoles persist in the soil however very little research has looked at residues in the faeces. We predict that Rycoben will have a negative effect on the species richness and abundance within the dung.

Aggressive Behaviour of Herring Gulls (*Larus argentatus*) and Lesser Black Backed Gulls (*Larus fuscus graellsii*) and the Link to Parental Quality:

In a mixed colony of Herring Gulls, parental quality was measured by which gulls kept their chicks alive for longest, attended the nest the most and provisioned their chicks frequently. To do this, the colony was observed 3-4 times a week for 6 weeks.

Preliminary results show that the longer a pair of gulls kept their offspring alive, the more often they exhibited aggressive behaviour. They also show that the most aggressive parents provisioned their offspring more often than less aggressive parents. Parent gulls that were at the nest for most of the time also exhibited higher frequencies of aggression than those that spent more time away from the nest.

These results indicate that more aggressive parents were better parents as they kept their chicks alive for longer than less aggressive parents and fed their gulls more frequently than less aggressive parents. Further observation of the data displays that parents who attended the nest more than others, were more aggressive, which is also indicative of good parental quality.

The Water Quality of Islay's Freshwater Lochs determined by the Freshwater Invertebrate Presence:

Overall, each loch has presented a diverse collection of freshwater invertebrates, with species such as freshwater shrimp (*Gammarus pulex*) and true worms (Oligochaeta) being abundantly recorded in all of the sampled lochs. For the majority of the lochs, over 10 invertebrate recordings were logged for each with some interesting collections such as the medicinal leech (*Hirudo medicinalis*), tadpoles and bloodworms. Primary analysis has highlighted the rare occurrence of stonefly nymphs (Plecoptera) which were only recorded in 2 out of 9 lochs. However various mayfly nymphs (Ephemeroptera) including flattened and swimming types, feature more frequently across the loch samples. Species such as freshwater hoglouse (*Asellus aquaticus*) and leeches (Hirudinea) were recorded and can be indicative of mildly polluted waters, categorised by low oxygen levels. Bloodworms which feature in some of the samples are a preferred food source of leeches. Further analysis will rank the water quality of each loch determined by their indicator species.

Acknowledgements -

We would like to thank our sponsors who provided the expedition with funding to support our work:

University of Glasgow Exploration Society Council, Glasgow Natural History Society, Whitley Wildlife Conservation Trust, The Royal Society of Biology Kilmaronock Roundtable, Scottish Enterprise , Three Rivers Learning Trust

We would also like to thank Professor Roger Downie and Dr Stewart White for their advice and help throughout the expedition. Any further context required for the mentioned projects can be sourced from the initial expedition prospectus.

Excursion Report Galloway Weekend, June 12-14th 2015

Bob Gray

Peter Robinson, project manager of the CVCWT kindly left a number of woodland map brochures at our hotel in Newton Stewart for us to collect. So on Friday evening 16 of us set off on a circular woodland walk at **Doonhill Wood/Blairmount Park**. The **park** is owned by Dumfries & Galloway Council and is managed as a wetland area around the former curling pond as well as having some amenity planting. The board walk and pond dipping platform were provided by CVCWT and we used them to observe at close quarters a number of mallard ducks together with a mute swan family one of whose four cygnets entertained us by attempting to mount the back of its mother. We were also able easily to identify the characteristic features of a healthy Japanese larch (*Larix kaempferi*), vast numbers of which are succumbing in this area to disease (of which more, later).



(1) Loch Trool; site of 1307 skirmish in background

Doonhill woodland, owned by Galloway Estates, is a mixed deciduous woodland which contains amongst many sessile oak, ash and hazel, most interestingly, a considerable number of old coppiced elms that have avoided Dutch elm disease. According to Oliver Rackham elm used to be a significant component of lowland, mixed woodlands. It was apparent that non-native sycamore and beech are colonising parts of this wood. The field layer

included many native bluebells (*Hyacinthoides non-scripta*) and woodruff (*Galium odorata*), considered to be ancient woodland indicator (vascular) plants in Scotland (AWVP, Crawford 2009).

On Saturday morning we met Pete Robinson, our guide for the day, at the Bruce's Stone carpark at the **Buchan oakwood** (SAC/SSSI) which provides an example of upland native oak woodland. From here is a fine view across Loch Trool (photo 1) towards the site of the local skirmish of 1307 that marked the effective start of the Wars of Independence. The site now contains swathes of Sitka spruce (*Picea sitchensis*) and a large area of clear-felled *Phytophthora* infected Japanese larch. Bruce's Stone is of granite placed on top of local exposed greywacke (photo 2). Elsewhere mainly Ordovician and Silurian (c.450 million years old) slates and shales make up the bedrock that produces most of the soils in the Cree valley. There is little glacial debris.

David Palmar drew our attention to a fine view of a pair of peregrine falcons in flight and feeding their young in a nest on crags overlooking Loch Trool.



(2) Bruce's Stone, Loch Trool

The effect of a deer fence was clearly demonstrated – within the enclosure was abundant growth of oak and rowan especially; whereas in the area around the Stone the widely separated but naturally regenerated trees looked as if they had been planted. The deer had thinned them out.

En route to the **Caldons** we passed some excellent, mature Scots pine, Norway spruce and silver fir that demonstrated their potential growth in this

area with its mild climate and c.140 cm (55") per year rainfall. The Caldon's Martyrs' Tomb area (SAC/SSSI) (photo 3), like Buchan, is considered to be an example of upland native oak woodland, i.e. growing on acidic, shallow, leached brown earth soil.

The canopy contains mainly sessile oak (*Quercus petraea*) and some birch (*Betula* sp.) whilst the understorey carried occasional holly (*Ilex aquifolium*), rowan (*Sorbus aucuparia*) and hazel (*Corylus avellana*).

Although some oak seedlings (photo 4) are obvious here, their paucity is due to the removal of



(3) Caldons - Martyr's Tomb

(4) Holly and sessile oak seedlings



many seedlings growing on in the Barclay Nursery thus saving them from depredation by deer in particular.

The field layer contained some yellow pimpernel (*Lysimachia nemorum*) and common cowwheat (*Melampyrum pratense*) both considered to be indicators of ancient woodland. From a bridge over the river Trool Pete drew our attention to rare river skaters (*Aquarius najas*) which are bigger than their relatives the pond skaters. We also observed some large red damselflies (*Pyrrhosoma nymphula*) and carder bees (*Bombus pascuorum*).



(5) Montane Plant Demonstration Garden

Continuing on our way southwards we stopped off at the **montane plant demonstration garden** (5) located beside the Glen Trool visitor centre. This was designed and set up by CVCWT volunteers and contains examples of montane woody species such as heaths (*Calluna* and *Erica* spp.), bilberry (*Vaccinium myrtillus*), dwarf willows [downy (*Salix lapponum*), woolly (*S. lanata*) (photo 6), eared (*S. aurita*) and creeping (*S. repens*)], rock whitebeam (*Sorbus rupicola*), aspen (*Populus tremula*) and rowan. (Volunteers have planted

up burnside areas beside the Merrick hill path and other high altitude habitats up to > 500m. near the source of the River Cree.)

Wood of Cree Although at a lower altitude (50 m a.s.l.) this is another good example of upland native oak woodland and is a particularly fine example of a wood that contains migratory bird species and a wide range of invertebrates, including butterflies, moths and deadwood beetles.



(6) Woolly willow (*Salix lanata*)



(7) Even-aged stand of oak, Wood of Cree

We were joined by Crystal Maw of the RSPB who proved to be a most entertaining guide, with bird impressions being her particular forte! Amongst other birds we heard pied flycatchers, wood warblers, chaffinches, robins of course and willow tits which, we were told, are the fastest declining bird in the UK owing to their lack of competitive ability.

Between 1650 and 1920 the oak was coppiced and used to provide charcoal for local iron smelting. The oaks here are mainly sessile, indicating a natural origin.

(Owing to its slightly higher tannin content, pedunculate oak was more favoured for planting during the period of industrial coppice activity.) In 1920 the wood was clear-felled. So, at almost 100 years since the last industrial coppicing cycle, the even-aged stand (7) is too immature for natural gap formation by windthrow or death to occur. Hence this reduces the possibility of natural regeneration that would lead to a mixed aged stand of trees. This is typical of much former oak coppice grown to provide tannin for leather and charcoal for iron furnaces. In addition mast years occur only every 5–10 years and deer browsing tends to prevent the growth of any surviving seedlings. This reserve holds the record for possessing the largest number of mammals in an RSPB reserve. We saw evidence of a badger sett and deer damage. It is of interest that local lead mines provided metallurgy for forest road construction when the Galloway Forest Park was being established. The lead prevents plant growth and so keeps the tracks clear (photo 8).



(8) View across the Cree valley

Barclye This area of rough grazing was purchased by the RSPB in 2001 and is twice the size of the Wood of Cree that it adjoins. Although the higher parts of Barclye are managed as moorland, our main interest was in the polytunnels in which the Trust grows local provenance trees (provenance 108) from seeds and cuttings on raised beds and in root trainers. The capacity of each of the two 18' x 36' tunnels is c.20K trees. Many species are grown, including from seed, juniper, rowan, holly, bird cherry, downy birch, hawthorn, aspen and guelder rose; from cuttings woolly willows from parent plants sown in 2010; and sessile oak seedlings grown on from wild collected stock. Owing to the risk of spreading *Phytophthora austrocedrae*, planting out of juniper has been restricted.

On Sunday we were met at the **Kirroughtree Visitor Centre** by Keith Muir, Head of Tourism for Galloway Forest Park FES, who kindly gave us an outline of the origins of the visitor centre, took us on a guided tour around a route close to the centre and answered our prolific questions during and after our return to the centre. Previously the area around the centre had been the forest tree nursery, providing millions of seedlings for planting out on the hillsides and valleys of the Galloway Forest Park, the largest in the UK. The nursery was closed in c.1976. Keith Muir has been in this job for some 11 years, amongst other things planning the construction of the centre by learning from other such centres throughout the country. (Interestingly he had previously worked in Sunart where he was responsible for the design and construction of the Loch Sunart bird hide with its impressive wheel chair access and which we visited last year.) He described the many problems in connection with landscaping, drainage, design and power supply that had to be overcome.

On our walk with him he explained how tourism has increased in importance compared to commercial forestry; how walker/biker conflict has been avoided by careful construction of the "Kirroughtree Wheel" (essentially a cyclist over path); how the outline of the visitor centre reflects that of the local hills; and he has amended the landscape in the Dark Sky observation area which illustrates the moon and the earth as two circles. At the new Wild Watch Hide we viewed at close quarters great spotted woodpeckers, nuthatches (photo 9) and various tits.

Along the route we encountered some silver birch deaths, apparently explained by having used nursery grown rather than natural seedlings. Some naturally regenerated ash saplings were remarkably tall for their age of three years and this was explained by the presence of a 'root map' so that when the overgrown seedlings were cleared this had led to an explosion of growth. (The same effect may be obtained with oak seedlings when they are pruned.)



(9) Nuthatch, Kirroughtree
(David Palmar)

Back at the centre KM explained how the local forest landscaping was based on chance historic plantings combined with deliberate choice. Thus, for example, a row of older beech had been deliberately left as a backdrop to the centre. A balance is sought between visually attractive continuous cover forestry and unsightly clear felling. The use of horses for extraction, as in other parts of the Borders, has advantages for biodiversity. The vast majority of larch trees in the Park have been infected with the devastating fungus-like pathogen *Phytophthora ramorum*, currently incurable. First discovered here in 2013, infected trees around the perimeter are felled first in order to reduce the risk of spore borne spread. Once the infected larch have been felled the area is left fallow as the spores live in the soil for some time and may infect newly planted trees. Natural regeneration may occur and replanting with a range of conifers and an increased percentage of broadleaved species takes place. The felled timber is sound and most of the larch is destined for BSW Dalbeattie, the UK's largest single site mill from where much of this timber is exported to China. Ironically given Kirroughtree's history as a forest nursery, trees for local planting are supplied from England.

We made our way northwards up the banks of the Palnure Burn along the Queen's Way until we came to the **Glen of the Bar Viewpoint** where we were able to inspect a dead larch at close quarters (photo 10). Other diseases that are adversely affecting trees here include red band needle blight (*Dothistroma septosporum*) on Corsican pine mainly but also lodgepole pine and more recently

Scots pine: and great spruce bark beetle (*Dendroctonus micans*) on all species of spruce (*Picea* spp.) in the UK.



(10) Larch infected with *Phytophthora ramorum* (David Palmar)

Beyond here we came to the **Goat Park** within which most of these wild goats had taken themselves off to a higher altitude before we appeared, although a few were spotted near the road after we had left. They are feral species, being descendants in Galloway of escaped domesticated goats in the 1970's. In the Highlands they appear to have descended largely from goats allowed to roam free at the time of the Clearances in the late 18th and early 19th Centuries. DNA evidence indicates that goats descended some 10k years BP from the Western Asiatic ibex. They are even-toed ungulates like other ruminants but they are the only ruminants able to climb trees.

Further on we came to the **Red Deer Range** where a few deer were visible. Historically their numbers were controlled by predators such as wolves and human hunting but wolf eradication by 1750 followed by the

Clearances reduced these controls, which led to a big increase in deer numbers. Today the two alternative approaches to deer control are the use of fencing or culling to reduce

numbers to a level that permits natural regeneration without fencing.

Our final stop of the day was at **Clatteringshaws Reservoir** (photo 11) where information boards provide star maps. Galloway Forest Park was designated in 2009 as only the fifth Dark Sky Park in the world and the first in the UK and Europe. The area contains a number of planted Sitka spruce (*Picea sitchensis*) and lodgepole pine (*Pinus contorta* ssp. *latifolia*). A ring count of recently felled



(11) Clatteringshaws Reservoir (David Palmar)

Sitka spruce stump indicated an age of c.50 years. There was regeneration of pine and spruce as well as much natural downy birch (*Betula pubescens*). The ground vegetation cover containing much bog myrtle and sphagnum mosses indicated an acidic peaty soil. Prof Jim Dickson kindly informed the party that bog pine had been uncovered in this area some decades ago. Hilary Birks in a paper (1975) devoted to

Scots pine showed that these remains were in a thick layer of wood peat. Carbon dating indicated they were c.5000 years old. Pollen analysis of peat cores had also been carried out and oak as well as alder and probably hazel had been found near the upper levels as well as at the bottom of the bog (almost 7000 years old) in that analysis. So oak probably grew here. This site is 180 m asl (650 ') and the altitudinal limit of upland oakwood is considered to extend from 150 to 300 m asl at this latitude. No such study seems to have been carried out at Glentool (80 m or 250' asl) where of course native oakwoods are established today. It would be interesting to know the history of tree cover at both Clatteringshaws and Glentool: but will we ever know what, if any, the tree cover was like in 1307 when Bruce made his way over the hill from Clatteringshaws to Glentool?

"Hair ice" in west of Scotland

Tony Payne

The recent flooding, followed by below-freezing temperatures, has led to sightings of "hair ice" which have appeared in the press and on the BBC web site. These examples have generally been from the east of Scotland, but on January 16th we spotted these in Dalzell Estate near Motherwell. The ice was on branches lying to



the side of the Chestnut Walk near the River Clyde. Recent research (*) has established that "hair ice" only forms in humid air and low temperatures on wood that contains the fungus *Exidiopsis effusa* (Auriculariaceae). It is still unclear what feature of *Exidiopsis* is involved (aerial hyphae?), but the fungus must be living as areas of wood treated with fungicides or hot water will not show the phenomenon.

*D.Hoffman, G.Preuss and C. Matzler (2015) Evidence for biological shaping of hair ice. *Biogeosciences* 12, 4261-4273.

