

Preventing Wildfires, learning from experience

Held in Kinlochewe Hall, 6th March 2020

Organised jointly by Wester Ross Biosphere and Highland Environment Forum

Chaired by Audrey Sinclair, chair of Wester Ross Biosphere

Useful mapping information can be seen on [Mapping Scottish Wildfires](#), SNH

Presentation notes:

Working with schools during Wildfire Awareness Week: Jenny Grant, High Life Highland ranger and Gavin Skipper, National Trust for Scotland ranger

Gavin and Jenny introduced their work with schools in Wester Ross during [Wildfire Awareness Week](#)

Jenny worked with Ullapool High School and Kinlochewe Primary School, discussing with pupils the causes and effects of wildfires, and developing a design brief for posters that will help to make people more aware of wildfire risks.

On Balmacara Estate staff and students from the crofting course at Plockton High School attended a workshop hosted at The Steadings Gallery in Balmacara Square. After an introduction by Gavin, Martin Benson, the Community Safety Advocate went on to give a general overview of wildfires and explained the role that the Scottish Fire and Rescue Services play in containing and extinguishing these fires. Iain Turnbull, Property Manager at Balmacara Estate and Rule Anderson, Ranger at Kintail and Morvich, both from the National Trust for Scotland gave their perspective on wildfires that affected Balmacara Estate in 2018 and Kintail in 2011. Andrew Slaughter, Estate Manager at Inverinate Estate was also on hand to talk about the Muirburn Code and explained how they carry out controlled burning to improve grazing opportunities.

Following on from the indoor session the students and a number of group leaders went into the moorland heath of Balmacara Estate to conduct a survey on an area impacted by a large wildfire in 2018. Students undertook a habitat assessment using randomly placed quadrats to assess vegetation coverage on areas impacted by wildfire compared to those that were not affected. Gavin presented these results to the conference.

Gavin and Martin also visited five local primary schools on a whistle stop tour of the region. They delivered a short presentation, part chat and part interaction using images and props to highlight the major issues and the triggers that can cause devastating wildfires. Over 150 pupils and staff attended the presentations at Kyleakin, Kyle, Plockton, Auchtertyre and Loch Duich primary schools. On the back of their talks students were encouraged to produce artwork about the dangers of wildfires whilst providing advice to persons on how to avoid a fire risk.

Both Jenny and Gavin will be using the artwork created to make posters that can be placed on community noticeboards and in local shops raising awareness about wildfires across the Wester Ross area.

The role of fire in estate management: David Allison, Head Stalker, Reay Forest Estate

David emphasised that although burning can be a useful tool in estate management, it is important that it is done with all the proper controls, and that burning isn't carried out too often at any site.

In deciding where to burn there are several considerations including:

- Undertaking a herbivore impact assessment, and avoiding areas that are popular with deer or sheep - as burnt ground would be rapidly eroded, and such areas are likely to be already grass-rich.
- Avoiding deep peat and areas of peatland restoration
- Avoiding burning close to woodland
- Getting the timing right - both by only burning under the right conditions, and avoiding burning a site too regularly.
- Creating firebreaks before a burn is started in order to prevent it spreading too far.

The effect of wildfire on wildlife: Ian Evans, Assynt Feld Club

Ian has logged the devastating effects of fire on wildlife in the course of botanical recording for the Flora of Assynt (Evans, Evans and Rothero 2002) and across the rest of West and North Sutherland for the BSBI Atlas 2020.

He described some of the conclusions of the Assynt Muirburn Project (2004-2006), the full report of which may be accessed on the Assynt Field Club web-site (www.assyntwildlife.org.uk) under Projects.

Detailed studies in Assynt suggest that fire-sensitive elements of the vegetation may now only exist in scattered refuges that have escaped burning. These include nationally-important juniper-rich dwarf shrub heath, and lichen and bryophyte communities of international importance. There is also extensive local destruction of animal life, both vertebrate and invertebrate. Out-of-control burning still continues, sometimes affecting very large areas.

He concluded: muirburn is unnecessary; it is ugly (important in an area so dependent on income from visitors); it contributes significantly to climate change, degrades soil fertility, prevents natural regeneration of woodland and destroys biodiversity. It has been employed as a land management practice since prehistoric times, but there is no longer any place for it in the 21st century.

'Fire Blanket' looking peatland recovery from wildfire: Roxane Andersen, UHI Environmental Research Institute

Roxane described the origin and purpose of the '[Fire Blanket](#)' research in the Flow Country. Following the wildfire that swept through 5,400 ha of Strathy, Sutherland in 2019, the Environmental Research Institute was successful in receiving emergency funding to undertake research into how habitats recover and how to increase resilience to fire.

This research is particularly significant, as it is able to link to several years of data gathering in the Flow Country, and a wide range of research projects already undertaken or in progress. Details of all research being undertaken in the Flow Country can be [seen here](#). Examples of data already being gathered include water quality and carbon fluxes.

Roxane described the process of 'bog breathing' - ie the seasonal fluctuations of water levels, causing a raising and lowering of the surface level of a healthy bog. Details of research into this can be [seen here](#).

Within the burn site there are a number of habitats including: forestry, undrained, drained, and restored peat. The forestry and damaged peat show a lack of 'breathing' fluctuation. During a period of low rainfall the surface level of the peat in good condition (breathing) will fall - decreasing the depth of dry peat above the water table, whereas the surface level of damaged peat remains high - and thus with a larger depth of dry peat. As a result the depth of burn and peatland damage is greater in the damaged bog areas.

Part of the wildfire occurred over an area where forestry had been felled, but brash had not been removed (typically brash was left to rot down for 12 months before removal), adding to the intensity of the fire. As a result, management policy has changed, and brash will be removed as soon as practicable after felling.

In contrast in the areas with effective 'breathing' the fire burn remained in the surface layers and did not penetrate the wet peat. This could be seen in aerial shots of the site, which showed only patchy burning in areas of healthy peatland. Research has demonstrated that 'bog breathing' is restored when peatland is restored - which will also increase the resilience of the area to wildfire.

The research will also look at the effect on river carbon following fire. Download a presentation about pre-fire research on '[The journey and role of organic matter in river systems](#)'

The fire blanket research will continue monitoring programmes at 52 sites within the Flow Country.

Wildfires from a Scottish Fire and Rescue Perspective:

Bruce Farquharson, Area Commander, Scottish and Wildfire Capability Lead

Alex McKinley, Group Commander, Scottish Fire and Rescue Service

Wildfires have increased by 30% in the last 10 years, and the wildfire in the Flow Country in 2019 was bigger than all the UK wildfires for that year put together, doubling Scotland's emissions for the 6 days that it burnt.

With climate change - and forecasts of wetter, milder winters and drier summers, it is likely that wildfires will continue to increase in both number and size - the warmer winters bringing higher plant growth rates, and therefore creating more to burn (fuel load).

Bruce noted that spring is the highest risk time for wildfires - with a build up of the previous year's dead plant material, which can rapidly dry and readily burn over large areas, even when the ground is wet.

Decreasing fuel load in an area will therefore decrease the intensity of a wildfire - which gives an argument for controlled burns, and highlights the need to be vigilant with some habitats - including newly establishing woodland.

Part of the remit of the Scottish Fire and Rescue Service (SFRS) and the Scottish Wildfire Forum is therefore to increase education and awareness of the dangers of out of control fire, and to try and prevent them happening. This will include encouraging land managers to have a fire risk plan, to manage their ground using fire breaks, and to use signage to alert the public when there is a high fire risk.

Alex McKinley is a Tactical Advisor on wildfires, and has the complex job of analysing wildfire behaviour in the context of many factors including temperature, wind, humidity, topography. SFRS also need to take into account the critical infrastructure of an area - roads, water, electricity etc. All the relevant factors will be considered by the Tactical Advisor to enable them to give advice to the commander in charge on the best approach to adopt to safely tackle the fire.

Alex brought home both the scale and complexity of managing wildfires, and the fact that the SFRS on the ground commander is responsible for the safety of anyone tackling the fire. There has to be a strict control of people in the immediate area of the fire (inner cordon) and SFRS has to know that they are experienced enough to tackle a fire. Alex noted that getting smarter in the tactics of tackling wildfires could lead to future firefighting only requiring one-third of the current effort required at an incident.

Helicopters can only be called to a fire if a land owner requests it - as they bear the cost (insurance is available). There are only a few helicopters with suitable equipment, which could become increasingly challenging if the number and scale of wildfires continues to rise.

SFRS is establishing specialist wildfire units around Scotland - who will be able to travel across Scotland as necessary.

In order to facilitate efficient response to wildfires the Service is constantly encouraging land managers to contribute to their Community Asset Register and develop **Wildfire Action Plans** - so that the SFRS can know what equipment, people and expertise is available to them in an area.

Workshop

Are there alternatives to fire for improving fertility?

Led by Peter Cunningham, biologist, Skye and Wester Ross Fisheries Trust.

[Download presentation pdf](#)

Peter noted that there are particularly low soil fertility levels in Wester Ross, as a result of the dominance of a phosphorus poor quartzite, Lewisian gneiss and Torridonian sandstone geology.

Discussion included:

- The fact that lookout knolls used by birds and mammals - and therefore naturally fertilised - supported a much more biodiverse and luxuriant growth than the surrounding moorland, indicating the benefits of raising soil fertility.
- That there is a need for more research into the short and long term effects of burning, with questions including:
 - How does the quality of vegetation pre-burn compare to that which survives/regrows post-burn?
 - How much fertility is lost as a result of burning?

And considered sources of inputting to soil fertility, such as seaweed and bonemeal - including that of deer and fish.

Peter suggested that land managers should consider phosphorus accounting as part of their estate management - eg if red deer are culled and removed how much phosphorus should be returned to the land in another form?

The recent [The management of wild deer in Scotland](#) was considered. This recommends considering licensing for muirburn for deer managers. Members of the workshop considered that this should be extended to crofting areas - probably through grazing committees (although it was noted that individual crofters can be difficult for a committee to manage).

It was noted for interest that Louisa Habermann, Stirling University is undertaking a Phd looking at [soil fertility on old crofting grounds](#)

Workshop

Visit to Beinn Eighe Field Centre to discuss, and learn about, practical ways to reduce fire risk on the reserve and managing a fire situation.

This covered:

- Looking at forecasts and when we put out our signs.
- Discussion about high risk periods and how we can prepare.
- Speaking to visitors about fire risk and responsible fire behaviour. Look at the Outdoor access code. Removal of fuel source for fires at carparks.
- Look at our fire card, what information is on it and how it can be used.

Practical demonstration of firefighting techniques

- Look at the equipment we have and when we would use it.
- Fire beaters and how to use them- opportunity for people to have a go