

FLORA AND FAUNA:  
A STUDY OF BENNACHIE'S FLORA

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SUMMARY

The flora and fauna of Bennachie is a key element in the make-up of its character and has played a significant role throughout its history. From the pure enjoyment of watching the flora and fauna through the changing seasons, to the resources it has provided to the many different generations, offers a fascinating study and one which the Bennachie Landscapes Project is now undertaking. This research is taking us from post-glacial times to the present and the aim is to explore the changing landscape of the hill as well as to promote its natural environment. When the Bailies of Bennachie were founded in 1973, one of its objectives was to, 'study the biology of the mountain and to preserve the flora and fauna'. Much has been achieved in this direction over the intervening years and the Bennachie Landscapes Project, by way of this study, is now helping to build on this work.

INTRODUCTION

Consideration of the flora and fauna of Bennachie is a long-term study that is being split into separate phases. The objectives for the first two phases are: (i) to create a database of the current flora on Bennachie and (ii) to investigate vegetation changes through past histories. These will create a firm basis from which to progress future work. The following account gives an overview of how this initial work is being undertaken, its progress so far, and its future potentials.

CURRENT FLORA

Owing to man's inquisitive relationship with the natural world and desire for knowledge, various records of Bennachie's vegetation have been made over the last few centuries. These have been sought, along with any new surveys or individual sightings of vegetation for inclusion in a database to be held at the Bennachie Centre. Copies of some of the older surveys have come via the Bailies's own library and whenever these records give a specific location, such as a grid

reference, they can still be used. A good example is a survey undertaken by James MacKay in 1988 and, owing to his meticulous details and maps, it is possible to plot where each record was taken. (A complete digitised version of this survey is currently in progress and part of it is now available for use at the Bennachie Centre.) Another example is one taken by Charles Fraser under the direction of Prof. C H Gimingham in 1975 that concentrated on the Pittodrie Estate. Although a good survey, there are no locational references for the individual plants and that, unfortunately, means it is impossible to include that data in the main database. However, although this has also been the case for a number of older records, they are still useful indicators as to what has been growing on Bennachie over the last few hundred years. These data are being retained as individual files under the name of the recorder. Again, some of these are now available at the Bennachie Centre.

Figure 1 is an example of the record layout being used and demonstrates how the information being obtained is categorised. This system is based on standardised UK biological recording data layouts. The scientific and common names of each plant surveyed is given along with its grid reference characterised to a 1km square. A closer determination is given for the more rare plants. It notes when they were first recorded and, if applicable, when they were last recorded, the name of the recorder(s) and any verification if necessary. It also shows the habitat where known and whether photographs of the plant have been retained.

Scientific Name	Common Name	Grid Reference	Date First Recorded	Recorder	Date Last Recorded	Recorder	Determiner's Name	Habitat	Photos
<i>Achillea millefolium</i>	Yarrow	NJ627210	12/07/1988	S. Brownley	15/08/2011	K. James	L. Lewis	Dry Grassland	
<i>Achillea Ptarmica</i>	Sneezewort	NJ630204	12/07/1988	S. Brownley					
<i>Anemone nemorosa</i>	Wood Anemone	NJ636205	01/05/2001	T. P. Wilson	11/05/2014	M. C. Lawrence			1
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	NJ6322	12/07/1988	S. Brownley	15/08/2011	K. James	L. Lewis		
<i>Arctostaphylos Uva-ursi</i>	Bearberry	NJ652231	12/07/1988	S. Brownley				Woodland	
<i>Athyrium filix-femina</i>	Lady-fern	NJ6523	13/08/1999	T. P. Wilson					
<i>Bellis perennis</i>	Daisy	NJ6623	12/07/1988	S. Brownley					
<i>Blechnum boreale</i>	Northern Hard Fern	NJ6721	01/07/1967	T. P. Wilson					
<i>Calluna vulgaris</i>	Heather	NJ6721	12/07/1988	S. Brownley	15/08/2011	K. James	L. Lewis	Boggy Area	2
<i>Calluna vulgaris</i>	Heather	NJ6722	12/07/1988	S. Brownley	15/08/2011	K. James	L. Lewis		
<i>Calluna vulgaris</i>	Heather	NJ6422	13/08/1999	T. P. Wilson					
<i>Calluna vulgaris</i>	Heather	NJ6424	13/08/1999	T. P. Wilson					
<i>Campanula rotundifolia</i>	Harebell	NJ626201	13/08/1989	T. P. Wilson					
	Lady's-smock or Cuckoo								
<i>Cardamine pratensis</i>	Flower	NJ621208	13/08/1999	T. P. Wilson	11/05/2014	M. C. Lawrence		Wet Grassland	1
<i>Carex nigra</i>	Common Sedge	NJ6220	12/07/1988	S. Brownley	15/08/2011	K. James	L. Lewis		
<i>Carex stellulata</i>	Star Sedge	NJ62792100	12/07/1988	S. Brownley				Wet acid flush	
<i>Ceratocarpus claviculata</i>	Climbing Corydalis	NJ630204	01/07/1967	T. P. Wilson					
<i>Ceratocarpus claviculata</i>	Climbing Corydalis	NJ631208	12/07/1988	S. Brownley	15/08/2011	K. James	L. Lewis		1
<i>Centaura Nigra</i>	Common Knapweed	NJ6320	12/07/1988	S. Brownley					
<i>Cirsium palustre</i>	Marsh Thistle	NJ6320	13/08/1999	T. P. Wilson					
<i>Cirsium vulgare</i>	Speargrass	NJ6421	12/07/1988	S. Brownley					1
<i>Cirsium vulgare</i>	Speargrass	NJ6422	01/07/1967	T. P. Wilson					
<i>Corylus avellana</i>	Hazel	NJ6322	12/07/1988	S. Brownley					
<i>Corylus avellana</i>	Hazel	NJ6321	12/07/1988	S. Brownley					
<i>Crataegus monogyna</i>	Hawthorn	NJ6321	01/07/1967	T. P. Wilson					
<i>Crataegus monogyna</i>	Hawthorn	NJ6322	12/07/1988	S. Brownley					
<i>Cytisus scoparium</i>	Broom	NJ6321	12/07/1988	S. Brownley					2
<i>Cytisus scoparium</i>	Broom	NJ6322	13/08/1999	T. P. Wilson					

Figure 1. Example of data sheet entries.

All new surveys and individual sightings are regularly added to this database along with areas that are resurveyed. Any new records are also passed to the North East Scotland Biological Records Centre (NESBReC) where details of plants and their locations can be accessed from their website ([www.nesbrec.org.uk](http://www.nesbrec.org.uk)). Searches to locate older records are also still continuing. As the database grows, it will provide a good indication of the variety and proportion of what vegetation is or has been on Bennachie over the last few hundred years. It will provide the facility to search and quickly acquire information regarding what plants are growing on the hill and where they are located or, alternatively, what plants are growing in specific areas and to indicate their particular habitats. Bennachie possesses a wide range of different habitats, both natural and as a result of human influence. Photos. 1 and 2 demonstrate two very different types. Aspects of future work will focus on critical studies of some of these varying habitats and will consider their development through time. Having a robust knowledge of present environments on the hill will provide a basis from which to compare and analyse patterns of change in the past. It will also assist in providing important baseline data required to help protect the hill's flora and to bestow a sustainable legacy for future generations to appreciate and work with.



*Photograph 1. Mixed woodland on Bennachie. (C. Foster)*



*Photograph 2. Area of worked-out peat digging. (C. Foster)*

#### PAST VEGETATION

Where no written records exist one approach is to understand the vegetation history of Bennachie through pollen analysis. Thanks to funding from the SNH (Scottish Natural Heritage) and the SSW (Scottish Sculpture Workshop) under the programme ‘Year of Natural Scotland 2013’ an opportunity for this study arose which was undertaken by the University of Aberdeen. In 2013 members of the Bailies of Bennachie Landscapes Project assisted Dr. Ed Schofield from the School of Geosciences at the University of Aberdeen, with the collection of a peat core from the plateau between Mither Tap and Oxen Craig, known as Moss Grieve (see Photos. 3 and 4). The area chosen for the pollen sampling was determined by a survey carried out in connection with constructing the flora database. This survey indicated where the deeper peats were located and a core sample of nearly 5 metres was extracted. From the pollen preserved in this sample a vegetation history of that area spanning the last 7,000 years has been compiled. The following is an extract from the Bailies Newsletter 2014 written by Ed Schofield on the initial results of the pollen analysis from Moss Grieve.

“The peat at Moss Grieve is surprisingly deep – almost five metres – and

radiocarbon dating shows that, in this location at least, it has been accumulating continuously for around 7000 years. The pollen record contained in the peat shows that heather moorland has been present on the summit of Bennachie since this time, but that mixed deciduous woodland (comprising oak, birch, alder and hazel) was formerly much more extensive on the surrounding slopes and in lowland areas surrounding the hill. Sustained clearance of this woodland by the native peoples of NE Scotland appears to have commenced in the late Bronze Age (around 1000 BC), and accelerated through the Iron Age, leading to the development of a largely open and pastoral landscape. The Pictish period (first millennium AD) witnessed some regeneration of birch woodland or scrub around Bennachie, suggesting that land-use was slightly less intensive at this time. Agricultural improvements are evident over the last three centuries, indicated by the appearance of increasing numbers of cereal-type pollen grains (oats and barley). A dramatic rise in the pollen

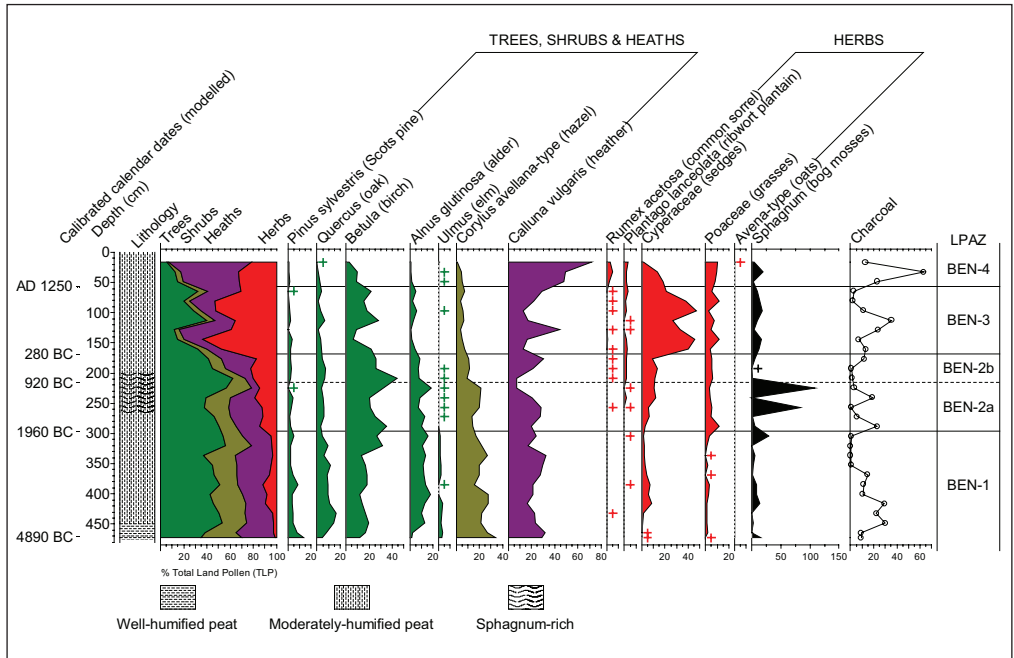


Figure 2. Percentage pollen diagram for Bennachie showing selected taxa as a proportion of a total land pollen (TLP) sum (i.e. trees plus shrubs, heaths and herbs). Pollen samples were counted to a sum in excess of 300 TLP. Boundaries between the local pollen assemblage zones (LPAZs) indicate the major points of change. The calendar dates placed on the zone boundaries were determined from a model developed from a series of radiocarbon dates on the peat. + indicates <1%. (Diagram provided courtesy of Dr J. Edward Schofield, Department of Geography & Environment, University of Aberdeen)



*Photograph 3. Extracting peat samples using a Russian corer. (C. Foster)*



*Photograph 4. Peat core sample. (C. Foster)*

of pine and spruce in the uppermost 10-20 cm of the peat column reflects the recent planting of these trees by the Forestry Commission and within the grounds of private estates.” (Schofield, 2014).

Through this pollen analysis a picture of Bennachie's ever-changing landscape is beginning to unfold. It is giving us the opportunity to explore the hill's diverse ecology since the last glaciation by helping to provide answers to questions such as: what factors influenced change; how fast or gradual were they; and whether such changes were natural or effected through human impact. The pollen analysis diagram clearly illustrates the vegetation fluctuations since the Mesolithic period some 7,000 years ago (see Figure 2). How many of these changes are man-made and how many have natural climatic causes are interesting issues. From a botanical perspective it is interesting to note that Heather (*Calluna vulgaris*) has been a dominant moorland plant throughout, whereas other native species have varying degrees of growth abundance. However, its dominance over all other species is a relatively recent phenomenon. Once the final report on the peat core is available a closer examination of Bennachie's vegetation and the significance of these changes will be studied.

#### PROGRESS AND FUTURE PLANS

Clearly, there is still plenty more research and collating to do before the database can be fully utilised. But, even so, some of the statistics already collected are giving some early results, as evidenced above in the recognition of the peat location for the pollen analysis. Information is coming via a number of sources and in some cases is creating some unexpected and exciting results. This sometimes leads to further investigation into directions not anticipated and gives scope for further analysis. One item received from the Botanical Society of Britain and Ireland, revealed that the rare Bog Orchid (*Hammarbya paludosa*) was once growing on Bennachie in the late 1800s. This was not otherwise recorded. The question now arises concerning whether the plant is extinct or, owing to its rather inaccessible habitat on Bennachie, has just been overlooked? Interestingly, several of these plants were recently recorded in Ireland for the first time since the late 19th century. Perhaps there may be a change in climatic conditions that would entice this orchid to bloom once again on Bennachie. This is certainly a plant worthy of further examination and is already being investigated by checking suitable habitats in advance of surveying during the plant's flowering time.



Photograph 5. The Common Wintergreen (*Pyrola minor*) recently found close to the Bennachie Centre. (C. Foster)

Maintaining records can lead to evidence to help substantiate whether or not a plant is now growing in a formerly unrecorded location. And it is always gratifying when such an event happens. This recently occurred during a botanical evening organised by the Bailies. Quite substantial patches of the scarce Common Wintergreen (*Pyrola minor*) (Photo. 5) were found where no previous records had recorded them. The tiny seeds from these plants can travel on the wind and, providing conditions are right, grow roots underground for years before forming a shoot. It is possible that the disturbance of the ground following a recent thinning of trees in a small area of the forest

convinced these plants with their globular pinkish-white flowers to finally emerge, thus creating a new entry for the records.

By studying plants and plant distribution, new data emerges that can inform concerning past and future land-management strategies. For example, vegetation can be a good indicator as to how the land was once used: Ribwort Plantain (*Plantago lanceolata*) can occur where there has been pastoral farming; Creeping Soft-grass (*Holcus mollis*) or Common Nettles (*Urtica dioica*) growing in abundance can indicate agricultural improvement/enrichment or disturbance; and an area of vegetation showing uncharacteristic trees or shrubs often denotes past human activity. Some of these examples have been useful in helping to understand the layout of the Colony sites that the Bennachie Landscapes Project is also studying.

One interesting opportunity has occurred that is permitting the observation of the regeneration of a specific area following the construction of a new wild life pond by the Forestry Commission. The area chosen for this had been clear felled in 2012 and after completion of the pond in 2014 there was no vegetation surrounding its immediate vicinity (see Photo. 6). A few native trees consisting of Hazel (*Corylus avellana*), Goat Willow (*Salix caprea*) and Alder (*Alnus glutinosa*)



*Photograph 6. Pond after construction with inset Photograph 7 showing it nine months later.*  
(C. Foster)

together with Yellow Iris (*Iris pseudacorus*) have since been planted by the Bailies, and currently this is being left to regenerate. The area is being watched with interest and surveys will, in time, be undertaken. However, after only nine months there has already been substantial regrowth (see Photo. 7). This presents a good opportunity to monitor regeneration and to produce a constructive record for observation and future analysis.

A large proportion of the work includes surveying; this is necessary both for seeking out new plants and habitats and for monitoring plants already known about. Any negative changes to vegetation can act as an early warning sign that there are problems, possibly major ones, and the rarer the plant the more vital such monitoring is in order to maintain its continued existence.

#### ENCOURAGING BENNACHIE'S ECOLOGY IN THE COMMUNITY

Studies and surveys, therefore, are an essential part of providing the necessary information needed to monitor and conserve the environment and to help towards historical objectives. But, it is important not to overlook the aesthetics

of the natural environment itself. In other words, the enjoyment of simply being out there and walking across the hill, taking pleasure in the world around us. How many people walk the footpaths of Bennachie but are not really aware of what is around them? Most see the wonderful colour of the heather when it is in bloom, but how many know there are three different types to be found on Bennachie - Bell Heather (*Erica cinerea*), Crossed-leaved Heath (*Erica tetralix*) and Heather (Ling) (*Calluna vulgaris*)? Watching the new spring leaves unfurl on the trees and shrubs is always an exciting time, but how many of these can be readily identified and which are native to Bennachie? Are people aware that the Common Butterwort (*Pinguicula vulgaris*), with its delicate violet flowers and yellow-green “starfish” leaves, catches and consumes small insects. And that’s not the only insectivorous plant on Bennachie - there is also the Round-leaved Sundew (*Drosera rotundifolia*). Then there are the numerous grasses, sedges, rushes, ferns, mosses, etc., the varied and colourful fungi and lichen, not to mention the different species of fauna.

This is another part of the project: to encourage the local community and visitors to Bennachie to gain more knowledge and awareness of that natural environment around them. Programmes to help encourage people to take a deeper interest in their surroundings have and will continue to be arranged by the Bailies. One aim of this present study is to bring a greater awareness of the flora and fauna of Bennachie to others by cataloguing, mapping and disseminating this information concerning what survives on Bennachie. And in so-doing, hopefully, to encourage others to take up the gauntlet and become personally involved in this ongoing process.

## CONCLUSION

Even at this early stage of the study, natural developmental processes have added new ways to consider the approach undertaken, giving the programme a greater diversity than at its concept. This will ultimately result in a more dynamic and versatile end product. Some of these flora and fauna studies overlap with other strands within the Bennachie Landscapes Project. This results in further collaboration and an interaction of ideas and discussions from a wide range of perspectives. Such an approach helps to provide more comprehensively-fashioned conclusions to be reached for many of the questions and ideas noted here. There is still plenty of research, surveying and recording to be undertaken but progress is sufficient enough to anticipate having the flora database in place and operational by late 2015. Phase three will be to produce a similar database covering the fauna

of Bennachie. Once this initial data collection process is in place, the stage will be set for advancing new research into a wide range of potential avenues and to consider the floral and faunal heritage of Bennachie from its past, through the present and into the future.

#### ACKNOWLEDGEMENT

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#### REFERENCES

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