

LOCH CILL AN AONGHAIS

H. J. B. Birks

OS Grid Reference: NR777618

Highlights

Pollen preserved in the sediments that infill the floor of this loch provide a valuable record, supported by radiocarbon dates, of the vegetational history of the south-west Highland region during the Holocene. It is particularly important for understanding the woodland history of the area.

Introduction

Loch Cill an Aonghais (NR 776618) is situated at an altitude of about 25 m OD on the north side of West Loch Tarbert, 12 km south-west of Tarbert in southern Knapdale. It is a Quaternary site of considerable importance in the study and reconstruction of the Holocene vegetational history of western Scotland (Birks, 1977). Its detailed and extensively radiocarbon-dated pollen record, elucidated by Sylvia M. Peglar (unpublished data), documents the forest history of the area and clearly illustrates that pine never grew in this part of Scotland (Birks, 1989). The pollen stratigraphy demonstrates the history and development of the western oak-forest type, a type of woodland that is restricted to the high rainfall areas of western Britain, such as Knapdale (Ratcliffe, 1977). Summary pollen diagrams for the site have been published by Birks (1977, 1980).

Description

Loch Cill an Aonghais occupies a small hollow within till. The underlying bedrock is Dalradian schist and quartzite. The loch is about 130 m long and 90 m wide and is bordered by western bryophyte-rich oak and birch woods on its northern and western edges. An extensive fen has developed on the southern and eastern sides of the loch. A 9.5 m core was obtained from this fen. It consists of 0.24 m of *Phragmites* peat overlying 7.0 m of fine-detritus organic muds. Below these muds there are 2.26 m of silty clays and sulphide-rich clays (Figure 10.16). Eight radiocarbon dates (Q-1410 to Q-1417) were obtained from the organic muds to provide a detailed chronological framework for the Holocene pollen stratigraphy of the site.

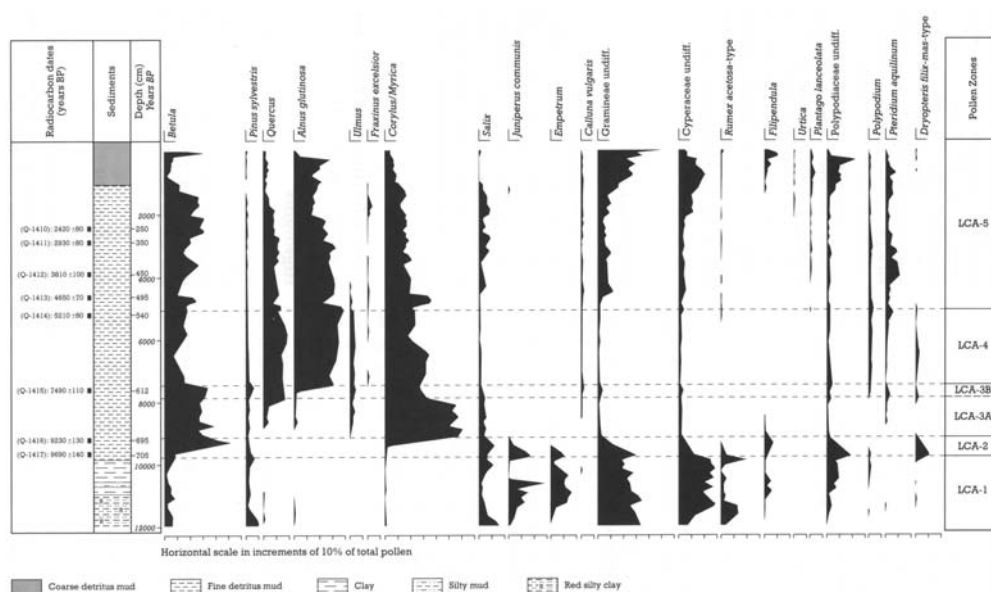


Figure 10.16: Loch Cill an Aonghais: relative pollen diagram showing selected taxa as percentages of total pollen (from Birks, 1980, after S. Peglar). Note that the data are plotted against time.

The basal clays contain a fully marine macrofauna, indicative of cool water conditions, similar to that found at Lateglacial Interstadial sites elsewhere in western Scotland (D.K. Graham, unpublished data).

Interpretation

It is clear that the site was an arm of the sea at a time when relative sea level was higher than today owing to isostatic depression. The pollen record (Figure 10.16) indicates that a treeless landscape prevailed prior to about 10,000 BP. The vegetation was probably a mosaic of *Salix* scrub, *Empetrum* heath, and species-rich grassland. Between 10,000 and 9600 BP fern-rich juniper scrub expanded, presumably in response to climatic amelioration at the onset of the Holocene.

Betula was the first tree to migrate into the area at about 9600 BP, at the expense of the shrub, dwarf-shrub, and grassland communities that were prevalent before 9600 BP. *Corylus avellana* expanded very rapidly between 9400 BP and 9100 BP (Birks, 1989). Hazel was quickly followed by the arrival of elm at about 9000 BP and its subsequent expansion at about 8500 BP. *Quercus* appears to have expanded gradually from about 8500 BP, but it was not locally frequent near the site until about 8000 BP. *Alnus glutinosa* expanded locally at about 7500 BP (Bennett and Birks, 1990). By about 6000 BP the forests in this part of Scotland were probably dominated by oak and birch on poorer soils and by hazel and elm on the richer sites. Alder was locally abundant in moist areas around the loch and within the forests.

At 5100 BP *Ulmus* pollen values fell dramatically and there was a small increase in the frequency of herbaceous pollen, suggesting the presence of small clearings within the forest. Further forest clearance occurred between 4600 BP and 2100 BP. These clearance activities resulted in accelerated rates of erosion and inwashing of clastic material from the catchment of the loch. Extensive forest clearance occurred at about 1300 BP. Cereals and flax appear to have been cultivated locally from 800 BP to 250 BP. Local fen development at the coring site obscures the regional vegetational history for the last 250 years.

The pine pollen values at Loch Cill an Aonghais are very low throughout the Holocene part of the record, indicating that pine was absent from this area of Scotland (Birks, 1989). This conclusion is unexpected, as it contrasts with the undoubted presence of pine further north (see Kingshouse and Loch Maree) and further south in the Galloway Hills (see Loch Dungeon).

Loch Cill an Aonghais is a site of national importance because of its very detailed and well-dated Holocene pollen record. It provides critical evidence for the timing of the arrival and subsequent expansion of the major forest trees of western Scotland during the Holocene. It also demonstrates the absence of pine in the southern Knapdale area and the history of forest clearance and agricultural land use over the last 5000 years. It is particularly important in the context of regional Holocene vegetational history as it provides a geological perspective for an area of Scotland where internationally important woodland types occur today (Ratcliffe, 1977). The Lateglacial part of the sequence demonstrates the transition from a marine to a non-marine environment during the fall in relative sea level over this period.

Conclusions

Loch Cill an Aonghais is a key site in the network of localities representing the pattern of vegetational development in Scotland during the Holocene (the last 10,000 years). In particular, the pollen preserved in its sediments provide a detailed record of the vegetation history of the western oak forest area, showing the pattern of forest development and the notable absence of pine.

Reference list

- Bennett, K.D. and Birks, H.J.B. (1990) Postglacial history of alder (*Alnus glutinosa* (L.) Gaertn) in the British Isles. *Journal of Quaternary Science*, **5**, 123–33.
Birks, H.J.B. (1977) The Flandrian forest history of Scotland: a preliminary synthesis. In *British*

-
- Quaternary Studies: Recent Advances* (ed. F.W. Shotton). Oxford, Clarendon Press, 119–35.
- Birks, H.J.B. (1980) *Quaternary Vegetational History of West Scotland*. 5th. International Palynological Conference, Guidebook for Excursion C8. Cambridge, The Botany School University of Cambridge, 70pp.
- Birks, H.J.B. (1989) Holocene isochrone maps and patterns of tree-spreading in the British Isles. *Journal of Biogeography*, **16**, 503–40.
- Ratcliffe, D.A. (1977) *A Nature Conservation Review*, 2 vols. Cambridge, Cambridge University Press, 401pp and 320pp.