Electronic Supplementary Material (ESM) 1 AMS ^{14}C dates from core LEVE14, Loch Leven, Scotland

Depth (cm)	Sample material	Radiocarbon age (yr BP ± σ)	Calibrated age (2 sigma)	Sample ID
68-69	Bulk sediment	1,882±37	cal AD 56-230	UBA-31803
96-97	Charcoal	827±34*	cal AD 1158-1269	UBA-31098
134-135	Bulk sediment	2,420±34	cal BC 569-402	UBA-31804

* indicates date included in the stratigraphic diagrams (Fig. 3 and Fig. 4), calibrated using Intcal13.14c (Reimer et al. 2013).

Reimer PJ, Bard E, Bayliss A, Beck JW, Blackwell PG, Bronk Ramsey C, Buck CE, Cheng H, Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Haflidason H, Hajdas I, Hatté C, Heaton TJ, Hoffmann DL, Hogg AG, Hughen KA, Kaiser KF, Kromer B, Manning SW, Niu M, Reimer RW, Richards DA, Scott EM, Southon JR, Staff RA, Turney CSM, van der Plicht J (2013) IntCal13 and Marine13 radiocarbon age calibration curves 0-50,000 years cal BP. Radiocarbon 55: 1869-1887

Electronic Supplementary Material (ESM) 2 A comparison of Shannon's Diversity Index (SDI) values calculated using unrarefied and rarefied testate amoeba count data.

Rationale: The counting of entire aliquots to determine testate amoeba sample concentrations can result in different count sizes above the minimum threshold of 150. To check whether this caused variation in the SDI values, the testate amoeba data were subjected to rarefaction (Birks 2012) and standardised to 150 specimens per sample using the 'rrarefy' function in the vegan package (Oksanen et al. 2017) in R version 3.3.2 (R Development Core Team 2016) (see Figure 1 below).

Results: The rarefied samples display very similar SDI values to those derived from the original counts suggesting that variations in count sizes above the minimum threshold of 150 do not significantly bias the SDI values. Consequently, the original SDI values were retained in this study.

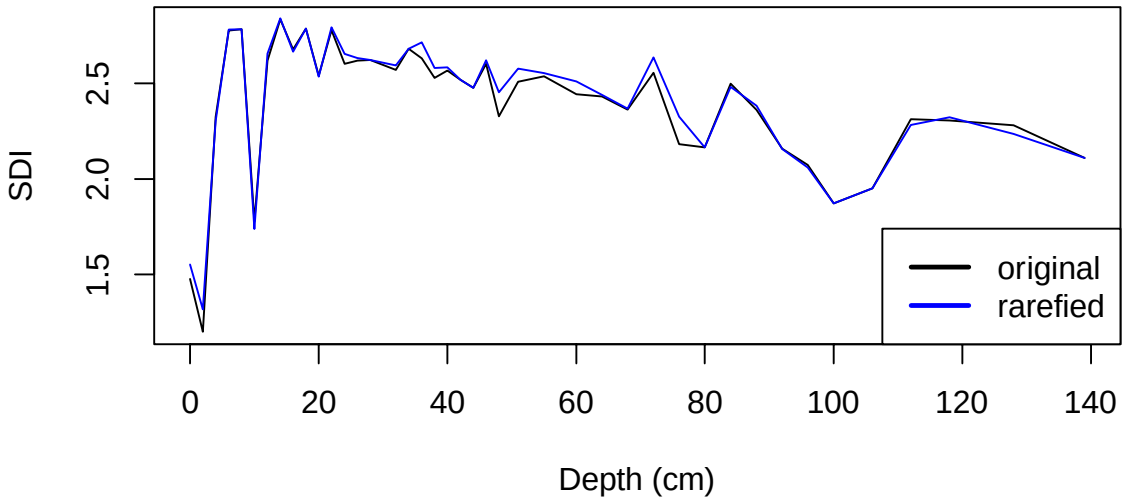

Figure 1 Graph showing SDI values from core LEVE14 calculated based on rarefied and unrarefied testate amoeba data.

References

Birks HJB (2012) Introduction and overview of part II. In: Birks HJB, Lotter AF, Juggins S, Smol JP (eds) Tracking Environmental Change Using Lake Sediments Volume 5: Data Handling and Numerical Techniques. Springer, Dordrecht, The Netherlands, pp. 101-121

Oksanen J, Blanchet FG, Kindt R, Legendre P, O'Hara RB, Simpson GL et al. (2017) vegan: Community Ecology Package. R package version 2.4-2. Available online at: https://cran.r-project.org/web/packages/vegan

R Development Core Team (2016) R: a language and environment for statistical computing. R Foundation for Statistical Computing, Vienna. Available online at: http://www.R-project.org