**Electronic supplementary material**

**Location Location Location: survival of Antarctic biota requires the best real-estate**

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Dataset can be downloaded from Dryad here: https://doi.10.5061/dryad.zw3r228bx

**Data collection.** We focussed on ice-free terrain represented by 15 currently recognized Antarctic Conservation Biodiversity Regions (ACBRs) [1]; we do not include South Orkney Islands. We compiled all published occurrence records for all springtail species considered to be endemic or native from these 15 ACBRs [2-21] and from our own unpublished records. We obtained the ten geothermal sites used in the analyses by Fraser et al. [22] from their Table S6. We compiled the geochronological data from all known cosmogenic-nuclide data from Antarctica (<https://www.ice-d.org/>) and from publications which were used to scrutinise the datasets. Cosmogenic dating is uniquely suited to Antarctic environments [23], however, there are problematic samples and locations. We include a selection of cosmogenic datasets to represent sites which clearly (or potentially) delineate Last Glacial Maximum surface elevations, and reject datasets where results are inconclusive due to isotope inheritance or incomplete or inconclusive results. From the included datasets we divided cosmogenic sites into two categories based on the 100 km radius around each site (using the criteria from Fraser et al. [22]): (1) those that showed unequivocal endemism; and (2) those where the provenance was equivocal. Setting these criteria, and using springtails as a proxy, was critical to identifying regions where glacial refuges for the vast majority of biota were most likely to have occurred.

**Software and file formats used.** All maps were created using the Antarctic GIS package ‘Quantarctica’ (<https://www.qgis.org/en/site/about/case_studies/antarctica.html>; [24]) in QGIS ver. 3.22.7 [25]. The ACBRs shown in figure 1 and Supplementary figures S1-S7 are included in an ‘Environmental management’ layer within Quantarctica and colours were chosen to match those used previously [1]. For the land topography of Antarctica we used the shapefiles from ‘Bedmachine’ [26] (downloaded from NSIDC, <https://nsidc.org/data/nsidc-0756/versions/2>) in QGIS ver. 3.22.7. Each input data file was saved as .csv files and imported individually into QGIS for: (1) all individual springtail occurrences (separated into each species), (2) geothermal sites (separated into large and small), (3) geochronological dated sites (separated into high refuge support, and low refuge support), and (4) eDNA signals of springtails. These data were then used to create figures 1 and 2 in the main manuscript, and for more detailed information in figures S1-S7 in Supplementary material.

**Compiled data accessibility.** The .csv data files we used in QGIS for springtail records, geothermal and geochronological sites shown in the two main manuscript figures (figures 1 and 2) and the focused fine-detailed figures (figures S1-S7), to reveal greater resolution of detail in each region, are available at the Royal Society's figshare portal. We also include our QGIS file used to generate the supplementary figures (QGIS\_suppl\_figs.qgz) and the .qlr ‘layer definition file’ (All\_layers\_definition\_QGIS.qlr) exported from QGIS, which can be imported into QGIS with Qantarctica along with Bedmachine, which maintains the symbols and colours we used in our figures to explore this data further.

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