

Table 3

Pollen zone descriptions for Carp Lake

Zone	Depth (m below water surface)	Age (ka)	Description
CL-1	1.30±3.70		
<i>CL-1a</i>	1.30±2.15	0±3.3	Diversity of conifer types is initially low but increases towards the top of the zone. <i>Pinus</i> percentages (<42%) dominate the record, and the high representation of Diploxylon-type <i>Pinus</i> suggests that the source is ponderosa pine. Haploxylon-type <i>Pinus</i> is attributed to western white pine. Also registered are modest percentages of <i>Abies</i> pollen (<5%), <i>Pseudotsuga=Larix</i> pollen (<5%), <i>Tsuga heterophylla</i> (<5%), <i>Quercus</i> (<7%), <i>Corylus</i> (<2%), and <i>Alnus rhombifolia</i> -type (<2%). Poaceae accounts for <5%. Aquatic taxa are equally diverse and dominated by Cyperaceae, <i>Typha latifolia</i> -type, and <i>Brasenia schreberi</i> .
<i>CL-1b</i>	2.15±3.71	3.3±9.1	Undifferentiated <i>Pinus</i> and Diploxylon-type account for most of the tree pollen (<85%). <i>Alnus rhombifolia</i> -type is <5% and <i>Quercus</i> is <4%. Aquatic taxa fluctuate between high percentages of <i>Hydrocotyle</i> -type, <i>Isoetes</i> microspores, and <i>Pediastrum boryanum</i> .
CL-2	3.71±4.62	9.1±13.0	Zone is characterised by poorly preserved pollen and low pollen concentrations. Mostly broken and degraded grains comprise the high <i>Pinus</i> percentages (<48%). <i>Alnus rhombifolia</i> -type is well represented (<10%) and attributed to white or red alder. Poaceae percentages are high at the top of the zone (up to 30%) and <i>Chenopodium</i> -type are abundant in some levels (<16%). <i>Typha latifolia</i> , <i>Sparganium</i> -type, and <i>Polygonum amphibium</i> -type are the dominant aquatic taxa. Indeterminate pollen accounts for up to 8%. The sediments are crumbly silty clay.
CL-3	4.62±8.25	13.0±31.0	High percentages of <i>Artemisia</i> (<56%), Poaceae (35%), and Compositae Tubuliflorae (11%) characterise this zone. <i>Artemisia</i> =Poaceae ratios are higher than in the overlying zones, but generally low. <i>Pinus</i> values are low (<32%), and <i>Picea</i> accounts for 3±6%, except between 14.6 and 16.8 ka when it reaches 10%. Nonarborescent pollen includes Caryophyllaceae, <i>Polygonum bistortoides</i> -type, <i>P. californicum</i> -type, <i>Eriogonum</i> , <i>Valerianella</i> -type, and <i>Phlox</i> -type. <i>Pediastrum boryanum</i> is abundant.
CL-4	8.25±10.40	31.0±43.2	Diploxylon-type <i>Pinus</i> is the dominant taxon, and <i>Picea</i> and <i>Pseudotsuga=Larix</i> pollen are present in low values. Poaceae, <i>Artemisia</i> , and other herbs are present in modest values as well. Cyperaceae, <i>Sparganium</i> -type, <i>Potamogeton</i> , <i>Myriophyllum</i> , and <i>Nuphar</i> are present in the aquatic assemblage. <i>Pediastrum</i> , a freshwater alga, is abundant in some levels.
CL-5	10.40±12.85	43.2±58.3	<i>Pinus</i> percentages (mostly Diploxylon-type) fluctuate (14±50%) and <i>Picea</i> and <i>Abies</i> pollen are consistently present. Percentages of Poaceae (<31%), <i>Artemisia</i> (<40%), and other Compositae Tubuliflorae (<8%) are moderate. <i>Phlox</i> -type pollen (<2%) is present in this interval. Cyperaceae and <i>Myriophyllum</i> percentages are high, and <i>Pediastrum boryanum</i> is abundant.
CL-6	12.85±15.15	58.3±73.0	Zone features high percentages of <i>Pinus</i> (<76%), mostly Diploxylon-type, and <i>Artemisia</i> (<25%). <i>Abies</i> (<5%), Poaceae (<6%), <i>Chenopodium</i> -type (<5%) are present in small amounts. <i>Myriophyllum</i> and Cyperaceae are the major aquatic pollen types.
CL-7	15.15±16.65	73.0±82.8	Percentages of <i>Pinus</i> and <i>Artemisia</i> are low, <24% and <10% respectively. <i>Abies</i> (<5%), Cupressaceae (<6%), <i>Tsuga heterophylla</i> (<6%), <i>Quercus</i> (<15%), Poaceae (<18%), <i>Chenopodium</i> -type (<6%), Ranunculaceae (<3%), and <i>Eriogonum</i> (<13%) are well-represented. Indeterminate (<29%) and pre-Quaternary pollen are abundant. The aquatics consist of Cyperaceae and <i>Hydrocotyle</i> -type (Umbelliferae).
CL-8	16.65±18.46	82.8±94.6	Percentages of <i>Pinus</i> pollen (<88%) are variable in this zone, and most of the grains are broken and undifferentiated. <i>Picea</i> , <i>Artemisia</i> , and Poaceae reach values of <14%, <62%, and <17%. <i>Alnus sinuata</i> -type is also present consistently (<2%). <i>Selaginella densa</i> -type spores are present in trace amounts (<1%). The dominant aquatic taxa are <i>Myriophyllum</i> and <i>Pediastrum boryanum</i> .
CL-9	18.46±21.02	94.6±111.0	High percentages of <i>Pinus</i> (<70%) come from Haploxylon-type and Diploxylon-types. <i>Picea</i> and <i>Abies</i> percentages are present in values of 6% and 4%. <i>Pseudotsuga=Larix</i> reach high percentages (3.8%) at the bottom of the zone, and a peak of Cupressaceae pollen (4%) occurs in the middle of the zone. <i>Alnus sinuata</i> -type is well-represented (<4%). The nonarborescent component is dominated by <i>Artemisia</i> (<32%), Poaceae (<16%), and Other Compositae Tubuliflorae (<7%). Indeterminate pollen increases to 14% at the top of the zone. <i>Isoetes</i> percentages are high, and Cyperaceae, <i>Myriophyllum</i> , and <i>Pediastrum boryanum</i> are present.
CL-10	21.02±22.22	111.0±118.4	Zone is characterised by moderate percentages (<20%, with a peak at 80%) of <i>Pinus</i> (mostly undifferentiated), Poaceae (13.1%), and <i>Artemisia</i> (28.4%). <i>Picea</i> (8.5%), <i>Abies</i> (1.2%), <i>Pseudotsuga=Larix</i> (3.8%), and Other Tubuliflorae (3.7%) are present in low values.
CL-11	22.22±23.42	118.4±125.6	The assemblage is dominated by <i>Pinus</i> (mostly Diploxylon-type) (<65%) pollen, but percentages of <i>Pseudotsuga=Larix</i> (<7%), Cupressaceae (<14%), <i>Tsuga heterophylla</i> (<2%), and <i>Quercus</i> (4%) are noteworthy. Poaceae (29%) and <i>Artemisia</i> (43%) are relatively low, and <i>Chenopodium</i> -type (<10%), <i>Eriogonum</i> (<9%), and <i>Pteridium</i> (<8%) are high. Indeterminate pollen is also abundant in some levels reaching values of 6%. Among the aquatics, <i>Myriophyllum</i> (<24%), <i>Sagittaria</i> (<3%), and <i>Brasenia</i> (<4%) are well represented.