Notice of the Final Oral Examination
for the Degree of Master of Arts

of

CHRISTOPHER HEBDA

BA (University of Victoria, 2014)

“Late Pleistocene palaeoenvironments, archaeology, and indicators of a glacial refugium on northern Vancouver Island, Canada”

Department of Anthropology

Wednesday, December 11, 2019
2:00 P.M.
Cornett Building
Room A319

Supervisory Committee:
Dr. Quentin Mackie, Department of Anthropology, University of Victoria (Co-Supervisor)
Dr. Duncan McLaren, Department of Anthropology, UVic (Co-Supervisor)

External Examiner:
Dr. Rolf Mathewes, Department of Biological Sciences, Simon Fraser University

Chair of Oral Examination:
Dr. Matthew Little, School of Public Health and Social Policy, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies
Abstract

Recent research has revealed human settlement on the Pacific coast of Canada extending back nearly 14,000 years, but much of the late Pleistocene record is unknown due to shifting sea levels, poor understanding of Cordilleran ice extent, and limited research on the biota of the coast during this time. This study, undertaken in Quatsino First Nation and ‘Namgis First Nation territories as part of the Northern Vancouver Island Archaeology and Palaeoecology Project, employs modern multi-proxy analysis of lake sediment cores from two sites on northern Vancouver Island to reconstruct palaeoenvironments during and immediately following the Fraser Glaciation in coastal British Columbia. Evidence from pollen, ancient environmental DNA, plant macrofossils, and diatoms indicates that Topknot Lake on the outer coast of Vancouver Island remained unglaciated through most (or all) of the local Last Glacial Maximum (since ca. 18,000 cal BP). The earliest vegetation consisted of spruce (Picea) parkland with grasses (Poaceae) from ca. 18,300-17,500 cal BP. After this, a herb-shrub tundra assemblage prevailed from ca. 17,500-16,000 cal BP with non-arboreal cold- and dry-adapted plants including willows (Salix), grasses, sedges (Cyperaceae), heathers (Ericaceae), and sagewort (Artemisia). After ca. 16,000 and into the terminal Pleistocene, Topknot Lake was dominated by pine, alder (Alnus), ferns, and aquatic plant species. In the Nimpkish River Valley deep in the Vancouver Island Ranges, Little Woss Lake also demonstrates a record extending to the late Pleistocene (ca. 14,300 cal BP). The environment comprised dry and cool conifer woodland dominated first by fir (Abies) until ca. 14,000 cal BP, then by pine, alder, and ferns from ca. 14,000-12,000 cal BP. eDNA evidence from ca. 14,000 cal BP corroborates these plant taxa as well as indicating brown bear and spring salmon in and around the basin at that time. A mixed-conifer assemblage consisting of pine, western hemlock, and alder followed from ca. 12,000-11,100 cal BP into the early Holocene. Collectively, these indicators demonstrate a persistent late glacial refugium on the outer coast and well-established biotic communities across northern Vancouver Island in the late Pleistocene. These results inform future archaeological research for early human habitation of coastal British Columbia and provide key evidence to support the viability of the coastal migration route for the first peopling of the Americas.