

CANADIAN ZOOARCHAEOLOGY / ZOOARCHÉOLOGIE CANADIENNE

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Editor's Note / Note de L'Éditeure

Greetings to everyone from the West Coast! I am on sabbatical here for this year, using the University of Victoria as my base. This allows me to use the wonderful osteology collection in the Dept of Anthropology, with the indulgence of the staff at Pacific IDentifications.

This issue focuses on BC coastal research, with 3 articles on zooarchaeological fieldwork and research that people are working on here. Two areas of the coast are highlighted: 2 different parts of the Queen Charlotte Islands, and Prince Rupert Harbour, both in northern coastal BC. A fourth article highlights the history and staff at Pacific IDentifications, a successful private business which identifies bones and also has time for research and some teaching! My thanks to Becky Wigen and Trevor Orchard at UVic, Tina Christensen at SFU, and the Pacific ID staff for helping with this issue.

Many thanks also to Donna Naughton in Ottawa for putting the issue together.

Kathlyn Stewart, Editor

Canadian Zooarchaeology is published twice a year at the Canadian Museum of Nature. News, letters, articles, books or papers for review should be sent to:

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Submissions are published in English or French.

Subscription costs (including GST) are:

Cdn \$8.50 - Individuals
Cdn \$17.00 - Institutions
US \$8.50 - Individuals

Please remit by cheque or money order made out to:
Canadian Museum of Nature-Zooarchaeology

Cover by Debbie Yee Cannon

Environmental Archaeology in Gwaii Haanas

by Trevor J. Orchard
Department of Anthropology
University of Victoria

Introduction

In May and June 2000, I was involved in a program of archaeological survey, excavation and site management in Gwaii Haanas National Park Reserve/Haida Heritage Site, Queen Charlotte Islands, British Columbia (Figure 1). The project, initiated by UVic and Parks Canada, involved two distinct phases of work. Phase I consisted of a pilot project designed to explore the potential for recovering environmental data from archaeological sites. Phase II of the project involved cultural resource management work carried out as part of Parks Canada's ongoing work in Gwaii Haanas. This paper summarizes the work that was carried out as Phase I of this project.

Our project was focused on the late pre-contact and early contact periods in Gwaii Haanas. This was a period of rapid and dramatic change for the Haida (Acheson 1998), and thus this period and region provide a particularly interesting case for the examination of changes in subsistence strategies and other human ecological interactions. The European contact which began in 1774 in the Queen Charlotte Islands (Blackman 1990), particularly activities related to the maritime fur trade such as a rapid decline and extirpation of sea otter populations, had a dramatic impact on the local environment. The removal of sea otters, for example, is known to have allowed the spread of sea urchins, which in turn limits the growth of kelp forests and their associated ecosystems (Breen *et al.* 1982; Estes and Palmisano 1974). Similar changes are known to have

resulted from the introduction of non-indigenous species, such as rats (Bertram and Nagorsen 1995) and raccoons (Hartman and Eastman 1999), to the islands. Furthermore, European contact introduced diseases and changed settlement patterns, leading to mass human depopulation of Gwaii Haanas and the sequential amalgamation of small villages of 2 or 3 houses into larger villages. By 1890, all the surviving Haida had settled in the villages of Skidegate and Masset on Graham Island to the north of Gwaii Haanas (Blackman 1990), and thus the Gwaii Haanas ecology had been greatly altered.

The current environment in Gwaii Haanas is largely a result of this human impact in the period since the first European contact. Though it is possible to speculate about many of the factors that are likely to have caused environmental changes, the pre-contact environment itself is largely unknown. Examination of environmental data from archaeological sites dating to the late pre-contact/early contact periods thus provides a unique window into this period of environmental change. Aside from providing a better understanding of the context in which the Haida people lived prior to European contact, knowledge of the "natural" pre-contact environment is a useful tool for the management of the relatively recently established Gwaii Haanas National Park Reserve/Haida Heritage Site. Such environmental remains can also contribute to an understanding of how Haida subsistence activities changed during this dynamic period.

Despite the importance and potential of environmental data from the late pre-contact/early contact periods in Gwaii Haanas, relatively little previous work has addressed this data or time period. Rather, most of the previous archaeological work in Gwaii Haanas has focused on Early Holocene



Figure 1. Map of Haida Gwaii showing location of sites described in the text. (Adapted from Fedje *et al.* 1996).

occupations or on general site inventory work (Fedje *et al.* 1996; Fedje and Christensen 1999; Hobler 1978). Perhaps the most relevant work is that carried out by Acheson and colleagues (Acheson 1998). This work did to some extent examine the late precontact/early contact period, but it was focused on changing settlement patterns. Acheson (1998) looked only secondarily at environmental data as a means of examining settlement and culture history, and not as a means of reconstructing the paleoenvironment itself.

Methodology

As indicated above, much of the previous archaeological work in Gwaii Haanas has consisted of the location and classification of sites through an extensive program of site survey. I have recently been involved in the production of a Parks Canada database that brings together the results of these site survey projects. This database contains information on the locations of all the known sites in Gwaii Haanas, the types of deposits found at each site, the dates of the sites when known, and the artifacts found or recovered at each site. This data provided a basis for the identification of sites with high potential for containing the information that we wished to recover. Specifically, we were interested in examining sites that: were occupied during the late pre-contact/early contact transition, and thus had dates and/or artifacts that indicated this period; contained shell midden deposits and thus had a high potential for the preservation of environmental remains; each represented a different set of environmental conditions in the form of exposed, protected and intermediate locations. Thus, the study sites were selected from the database prior to the beginning of our field season.

Our field crew for the project consisted of Tommy Greene of the Haida Nation, Daryl Fedje and Ian Sumpter of Parks Canada, and Dr. Quentin Mackie, Martina Steffen, Cynthia Lake and myself from the Department of Anthropology, University of Victoria. Prior to excavation, each site was examined and tested via surface exposures, deposits in windfalls, cutbanks and other natural exposures, and through probe and auger testing. Such testing served primarily to verify the presence of preserved environmental remains in the form of shell midden deposits. Based on this testing one site, 1221T on the East coast of Lyell Island, was eliminated from our sample due to inadequate shell midden deposits. This site was replaced with site 740T on East Copper Island, which is another exposed site that had previously been considered. Soil probes and augers were also used to aid in the placement of excavation units. Such subsurface sampling techniques have been shown to provide a reasonably good picture of the distribution of subsurface deposits (Stein 1986; Casteel 1970). Auger samples were also collected in some cases, and may be used as a supplemental source of environmental data (for example, see Cannon 2000; Casteel 1970).

Excavation units were placed judgmentally based on the results of soil probing and augering. Units were 1m by 1m, excavated in 10 cm arbitrary levels. Whenever possible, these units were excavated until the underlying sterile deposits were reached. To facilitate the recovery of environmental data, all material was water screened through nested 1/4 inch and 1/8 inch screens. All bone and a representative sample of shell was collected from all screens, as well as any other environmental remains that were found including floral remains and fish scales. In addition, column samples were collected from one wall of each unit following excavation, as column samples have been shown to provide a representative sample of environmental remains from a unit (Casteel 1970, 1976). All collected material is in the process of being analyzed, though the

complete results of these analyses are not yet available.

All artifactual material was also collected and carbon samples for dating purposes were collected when available. Each site was also mapped using a laser theodolite.

Site 923T

Site 923T is located on the west coast of Ramsay Island, just south of Ramsay Point (Figure 1). This location places the site in an intermediate position in terms of exposure compared to the more exposed 740T and more protected 1134T, described below. The site occupies an area of approximately 110m by 30m and is located on a relatively flat terrace approximately 1m above the current high tide level. Previous visits to the site identified shell midden deposits in the wave-eroded cutbank along the front of the site and in the base of blowdowns. In addition, contact-period artifacts in the form of iron fragments and a clay pipestem fragment were collected in 1990.

Auger tests revealed some pockets of shell midden deposit, though shell midden was relatively scarce. Two 1m by 1m excavation units were placed based on the results of auger tests and surface examination. Unit 1 was placed on a ridge that appeared to delineate one side of a house platform, and was excavated to a depth of approximately 70cm. Unit 2 was placed in the center of the apparent house platform, and was excavated to a depth of approximately 65cm with the northwest quadrant being excavated an additional 20cm. Fire broken rock (FBR) was present throughout the deposits, though it was most common in the first 20cm of the unit. No radiocarbon dates have yet been run on material from 923T. Artifacts, however, included a small fragment of glass and a fragment of metal from the upper levels of the

site. Also several non-European artifacts were recovered, including pecked and ground stone, flaked stone, and worked bone. These artifacts in combination seem to indicate that the site was occupied during the targeted time period. Unfortunately, there was not a large amount of environmental remains recovered, and shell midden proved to be very scarce in the excavation units despite the midden that was apparent in the auger tests.

Site 1134T

Site 1134T is located in Darwin Sound on the east coast of Moresby Island (Figure 1), a relatively protected location in terms of exposure. The site occupies an area of approximately 85m by 25m and is located on a terrace with an elevation of approximately 2.5m above the high tide level. Previous work at the site identified shell midden deposits, particularly in the steep, eroding cutbank along the front of the terrace where these deposits appeared to extend to a depth of ca. 2m below the surface of the terrace. This previous visit also recovered part of a maritime fur trade era bottle. Thus, there was good potential for the recovery of environmental remains dating to the late pre-contact/early contact period.

Auger testing and probing revealed a black cultural matrix to a depth of ca 60cm dbs over much of the site area, but no shell midden was recovered in these tests. Because there were shell midden deposits still evident in the bank at the front of the site, as had been previously recorded, two 1m by 1m excavation units were placed near the edge of the terrace immediately adjacent to the visible shell midden deposits. Unit 1 was excavated to a depth of ca 50cm dbs, with the northeast quadrant being excavated an additional 20cm. The presence of numerous large roots made further excavation impossible. Unit 2 was

excavated to a depth of ca 70cm dbb with the southwest quadrant being excavated an additional 20cm. Shell midden deposits were not encountered in either of the units, and environmental remains were very scarce. The top levels of both units produced a number of contact period artifacts, however, including glass fragments, blue glass trade beads, a carved stone pipe, metal fragments, a ceramic fragment, and a white glass button.

The lack of shell midden deposits and the relatively shallow nature of the cultural deposits in excavation units 1 and 2 called into question the nature of the shell midden deposits in the exposed bank at a depth of up to 2m below the surface of the terrace. By examining the natural erosional processes along the front of the raised terrace, we concluded that the shell midden deposits were likely shallow deposits that had folded down onto the surface of the bank as the underlying sediments eroded away. Thus, two vertical 1m by 1m excavation units, units 3 and 5, were excavated horizontally into the bank to depths of 25cm and 15cm respectively. These units produced considerable environmental remains in the form of shell and bone. Unit 3 in particular contained a dense feature of fish bone and sea urchin shell.

The presence of artifacts attributable to the maritime trade period suggests that the site was occupied during the early contact period if not prior to contact. This is further evidenced by an accelerator mass spectrometry (AMS) date on charcoal taken from the bottom of unit 3. This material produced a date of 190 ± 40 uncalibrated 14C years BP (CAMS#70706). Unfortunately, this date falls on a relatively flat section of the established calibration curve, and when calibrated using OxCal (Version 3.5, © Bronk Ramsey 2000) produces a 95.4% probability that the date falls between 1640AD and 1960AD. Nevertheless, this range encompasses the late

precontact and early contact periods.

Site 740T

Site 740T is located on East Copper Island in Skincuttle Inlet (Figure 1), an exposed location. Despite the exposed location of East Copper Island, site 740T is situated at the end of a small, protected inlet that allows for easy access at high tide. Previous site visits identified a large shell midden encompassing an area of approximately 110m by 80m. These visits also identified a number of historic period artifacts which suggested that the site may have been occupied during the late pre-contact/early contact period transition.

Soil probing verified the presence of shell midden deposits, and two excavation units were placed at the front and back of an apparent house feature located on a raised ridge or terrace to the north of the access beach. Excavation unit 1 was located on a ridge that appeared to form the back of the house floor, and was excavated to a depth of only 15 to 20cm. Excavation unit 2 was located at the front of the apparent house feature, to the south of unit 1, and was excavated to a depth of approximately 30 to 35cm. Deposits in both units consisted of dense whole and crushed shell dominated by California Mussel (*Mytilus californianus*) and barnacle. In addition, these units, particularly unit 2, produced a considerable amount of bird and fish bone. An AMS date on material taken from level three in unit 1 produced a date of 390 ± 50 uncalibrated 14C years BP (CAMS#70708). Calibrated using OxCal, there is a 95.4% probability that this date falls between 1430AD and 1640AD. This suggests that the occupation that produced the shell midden deposits may have occurred just prior to the period of European Contact. Nevertheless, the considerable environmental data that were recovered from the two

excavation units at 740T should provide a good late pre-contact environmental baseline.

Conclusions

This environmental archaeology pilot project demonstrated the potential of environmental archaeological work in Gwaii Haanas. Though very little analysis has yet been completed, the preliminary results of this pilot project, which was intended to lay the baseline for further, more extensive studies, confirm the availability of a wealth of environmental data in sites that are known, through the presence of early European trade goods, ethnohistoric records, and radiocarbon dates, to have been occupied through the early contact period.

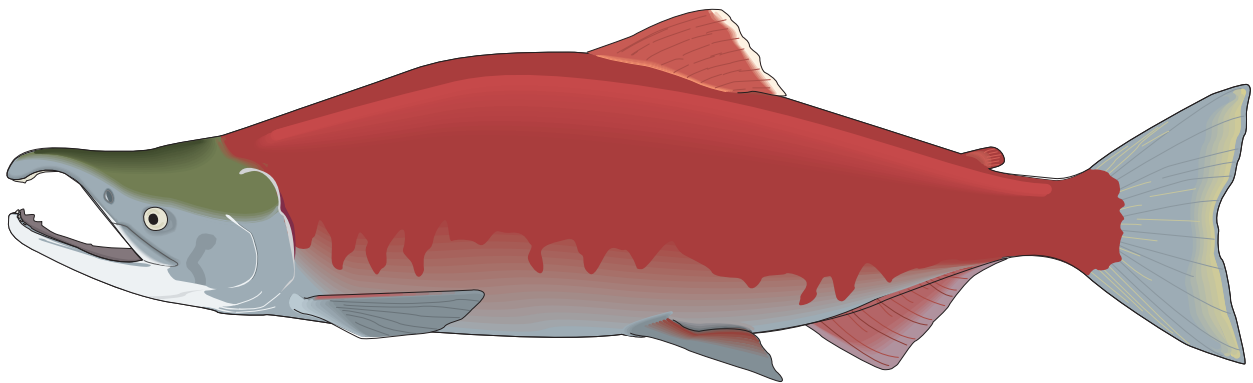
Sorting and analysis of collected material is currently being done by Martina Steffen, Quentin Mackie and myself, and faunal identification and analysis is being conducted under contract by Becky Wigen of Pacific IDentifications. Preliminary analysis has identified 34 taxa of fish, birds and mammals, with the most common taxa including salmon, rockfish, Cassin's auklet, and Ancient murrelet.

The pilot project also demonstrates that it is possible to use the previous site inventory data to identify likely sites and to recover environmental data through a relatively simple program of core and auger testing and small scale excavation. Analysis of the material recovered through this pilot project, will provide data to aid in planning future, more extensive work as well as providing useable data in and of itself. I plan on continuing this environmental archaeology project as part of my upcoming PhD research at the University of Toronto.

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Pacific IDentifications Inc: A West Coast Faunal Success Story

by Kathy Stewart
Canadian Museum of Nature, Ottawa

A great success story combining business and faunal analysis began in the fall of 1988, in Victoria BC. Two women – Susan Crockford and Gay Frederick – were at the point in their lives where they either had to leave the work they loved – faunal analysis – and get “real jobs”, or else figure out how to make a decent living doing bone identification. They got together with a third woman – Rebecca Wigen – who had started an osteology collection at the University of Victoria in the 1970’s and who also did faunal contracts – to find a solution.



Susan Crockford, Gay Frederick and Becky Wigen

The three women had been friends for several years and all three had a background in Archaeology or Biology - Susan had a BSc in Zoology from the University of British Columbia (UBC), Gay had received her PhD in Archaeology at UBC and Becky had her MA in Archaeology/Anthropology from the University of Victoria (UVic). All had an extensive background in bone analysis – Gay’s doctoral dissertation had had a major faunal component, she had started the comparative zooarchaeology collection at the Royal British Columbia Museum (RBCM) as

their Curator of Bioarchaeology, and after leaving the RBCM she was doing contract bone analysis on the side. Susan started as a summer student at the RBCM (under Gay’s supervision) working with the osteological collections, and then stayed on to do faunal identification contracts. Becky worked as Laboratory Instructor in the Department of Anthropology at UVic, and started the comparative osteological collection in 1977 both as a teaching collection and for identification, and was also doing bone identification contracts during her non-salaried summer months.

With their collective and complementary academic backgrounds and faunal experience, and with the University of Victoria osteological collection which Becky had started, the three women realised that together they could take on any faunal contract that came their way. Plus, if they joined forces so they weren’t competing against each other for contracts and could pool resources for overhead such as advertising, they would be better off economically. So, they decided to start a bone identification company together. Meetings were held to determine the purpose of the new company, name and logo. The company was set up in Fall 1988, and named Pacific IDentifications. Rates were to be charged by the hour, as the women found that estimating costs of fixed-price faunal contracts too full of pitfalls. The hourly rate was chosen to cover salaries and overhead. Gay did the accounting books for the first year, and Susan has been doing them since.

With a small amount of capital Susan, Gay and Becky designed and mailed brochures describing their company and themselves. However, the mailings proved unsuccessful, as they received no responses whatsoever. Numerous phone calls were then made to colleagues past and present to tell them of the new service. Contracts almost immediately started to come in. The first contracts were almost all from archaeological projects, primarily from

BC, but also from Washington and Oregon. Archaeological projects remain to this day one of Pacific ID's primary sources of contracts.

A big turning point in the history of Pacific IDentifications came in 1989 when Becky was looking for skeletal specimens in Nanaimo. She visited the Department of Fisheries and Oceans (DFO) and when she was asked about Pacific ID and what they did, the Fisheries person expressed surprise that they could identify fish bones. Apparently in the DFO studies of sea mammal diets, he and associated staff had only been identifying fish otoliths from scat samples, not the cranial and postcranial elements. When he showed Becky scats from a sea mammal he was studying, she was immediately able to identify the bones to species of fish. The Fisheries staff were so impressed they immediately sent large numbers of bones off to Victoria for Pacific ID staff to analyse. Pacific ID still receives contacts from DFO to identify bones associated with sea mammals.

The source of Pacific ID's revenue has changed considerably since its inception in 1988. In the first two years of operation, Pacific ID received about 89% of their contracts from archaeological sources and 11% from biological sources; now the ratio is reversed, with about 65% of the contracts being biological, and 35% archaeological. Another shift in contracts is country of origin. In Pacific ID's first two years, 70% of the contracts were Canadian in origin and 30% American, now these numbers are exactly reversed. Apparently there are more American biological sources for money than Canadian biological sources, at least on the west coast. The women also state that money from Canadian archaeological sources has declined considerably in the past few years, and say that if they hadn't diversified to do biological contracts, the company would not likely have survived.

Over the past 13 years, the company has had

enough business to support one person fulltime (Susan) and one or two people part-time (Gay and Becky). When there have been too many contracts at one time, other zooarchaeologists have been subcontracted to get the work done. To augment money from identification contracts, Pacific ID has also provided training in bone identification through fee-charging seminars and workshops. Both Gay and Becky now work full-time at other jobs (Gay was formerly at RBCM and then Malaspina College, and Becky is at University of Victoria) but both still work part-time at Pacific ID doing contracts.

Becky continues to manage the comparative osteological collection which she began at the University of Victoria. Specimens for the collection have come from a variety of sources – the Fisheries department at the University of Washington (where Becky's father worked), the SPCA, from donations, and from the Royal BC Museum. The University of Victoria also provided funds for students to prepare skeletons for the collection. The fish bone unit of the collection was greatly augmented in the middle 1980's when Gay and Susan applied for and received a SSHERC grant to collect and prepare freshwater fish skeletons. As the number of contracts continued to grow, many of the bones to be identified came from areas such as the Bering Sea, where the UVic collection was weak. In these cases field biologists have been asked for help in collecting specimens to augment the collection.

With a total of about 1800 specimens, the University of Victoria collection is one of the largest in Canada, and one of the best in North America for Northern Pacific fishes. The collection is open for the public to use, and while there is a charge for those working on contract, students and researchers can use it free of charge.

A recent addition has been Pacific ID's web site. While response has been good, inquiries from the site have provided more entertainment than tangi-

ble contracts. One gentleman inquired if Pacific ID could do the DNA analysis of a boot which he thought belonged to Jesse James! Regretfully, they had to turn him down.

Pacific IDentifications' co-founders have not let their research interests lapse nor their networking with the academic community. In the early 1990's, Susan Crockford initiated a project on the osteometric analysis of indigenous dogs from the Northwest Coast, a project which was expanded to include genetic analysis of DNA extracted from bone. Under Susan's lead, Pacific IDentifications partnered with the University of Victoria to develop a technique for extracting DNA from archaeological bone. The partners applied for and received a \$260,000. grant over three years from NSERC to complete this project, resulting in several subsequent publications. Susan has several other related publications, and is active in presenting research results at conferences. Gay Frederick also has several publications and conference presentations on Northwest coast zooarchaeology. Becky Wigen undertook the monumental job of organising the 1998 International Congress for Archaeozoology (ICAZ) in Victoria and is active in that organisation. She has also presented conference papers and posters on sampling fauna.

Now, 13 years later, Pacific IDentifications is firmly established, with an excellent reputation among both archaeologists and biologists. Word of mouth is still Pacific ID's best means of obtaining new contracts, so Susan, and sometimes Becky and Gay, attend Biology and Archaeology conferences to maintain Pacific ID's network. Susan often sets up a table to advertise Pacific ID's services, so watch for her at your next conference!

Pacific ID's business and professional success shows that with expertise, persistence and a bit of leg work, bone identification can be a viable career option. So don't forget faunal analysis when thinking of a new profession!

If you would like further information about Pacific IDentification, or would like to contact Susan, Gay or Becky, their emails are:

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Rebecca Wigen: rjwigen@uvvm.uvic.ca*



Fauna from Prince Rupert Harbour Sites, BC: Preliminary Findings

by Kathy Stewart

Canadian Museum of Nature

In 2000 a team led by Dr Gary Coupland, University of Toronto, excavated three sites in the Prince Rupert Harbour area, in north coastal BC (Figure 1). Of the three sites, two – Phillips Point and

Tremayne Bay – had not been previously excavated, while the third – Boardwalk – a very large, stratified site, had been excavated in the 1960's by a National Museums of Canada team (Figure 1).

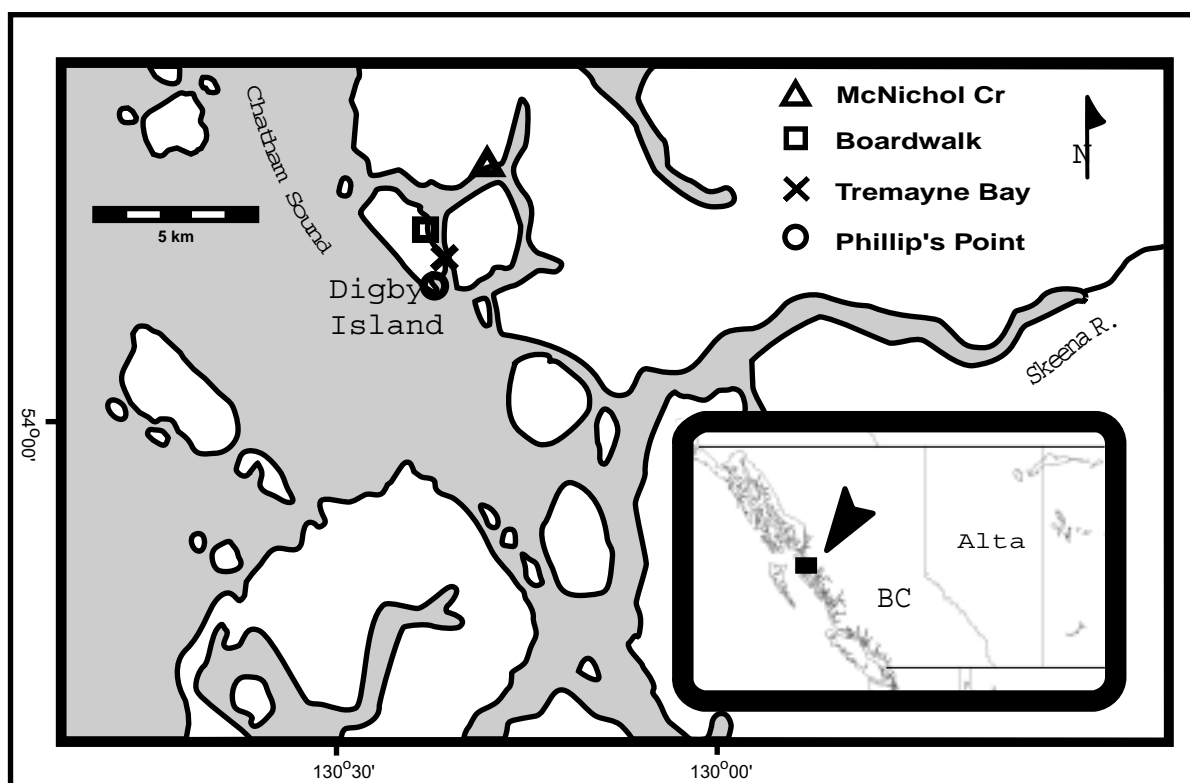


Figure 1. Map of the Prince Rupert Harbour area.

The 2000 excavations are part of an ongoing field program of determining prehistoric subsistence and economy in Prince Rupert Harbour, an area which contains dozens of sites and was occupied at least from 6000 years ago, although the sites discussed here date from about 1500-2000 years ago. A fourth Prince Rupert Harbour site,

McNichol Creek, was excavated in the 1990's and is included here for comparison (Coupland et al, 1993). Faunal preservation is excellent at the four sites; faunal elements were recovered through use of a 6.3 mm (1/4") mesh to dry-screen 75% of the matrix, while 25% of the matrix was wet-screened through 2.8 mm (1/8") mesh. Column sam-

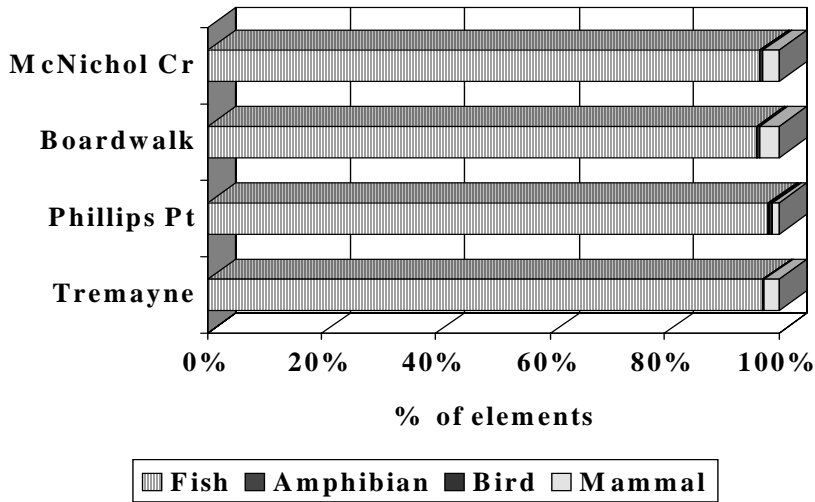


Figure 2. Proportions of elements by Class at 4 PRH sites

ples were also taken. My particular interests are to identify micro-regional differences in seasonality, diet, procurement, processing and preparation trends, as well as record zoo- and biogeographic changes among the vertebrate fauna. Another member of the team is studying the shellfish recovered from the sites.

A total 33, 858 vertebrate faunal elements have been identified to date, about half of the total recovered. Of these, about 90% are identifiable to class, and about 15% of the total are identifiable to order or better. In terms of bone identification from archaeological sites, this represents a very

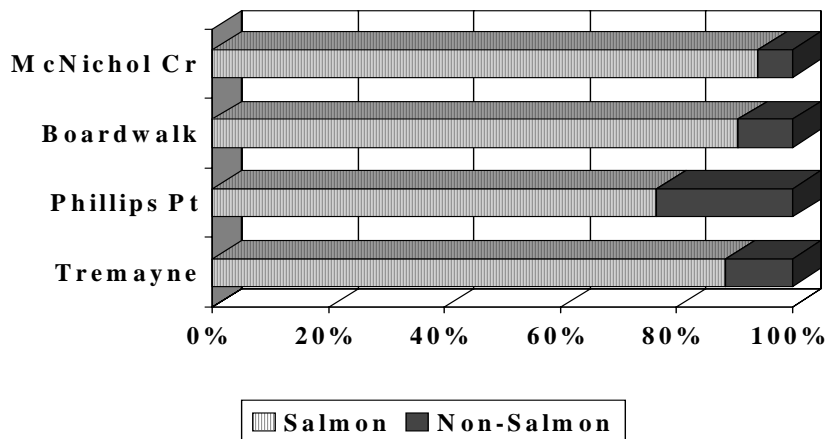


Figure 3. Proportion of salmonid and non-salmonid fish elements at 4 PRH sites.

high rate of identification and indicates excellent preservation. While analysis of the fauna is ongoing, several trends are already apparent. First, as Figure 2 indicates, numbers of fish elements far outnumber those of other classes, comprising over 90% of all elements. While this is no surprise in coastal sites, previous excavations at Boardwalk had focussed on mammal and bird recovery, so that fish remains were reported to be much less numerous than mammal and even bird remains (e.g., Stewart and Stewart 1996).

Among the fish, Figure 3 clearly shows that salmon are dominant at all sites, particularly at the McNichol Creek, Boardwalk and Tremayne sites, where they comprise about 85% of fish remains; at Phillips Point they comprise about 75% of the fish. Salmon can range up to 145 cm in length, are common

on the coast (at least until recently) are relatively easy to catch at specific times of year, and are a good food fish, hence their popularity. Non-salmonid fish include herring, which is the most numerous fish after salmon at all sites, particularly at Phillips Point. Previous studies had only rarely documented the prehistoric importance of herring, because these fish rarely grow more than 30 cm in length, and their bones are small and usually only retrieved using an 2.8 mm (1/8 inch) or smaller screen.

In addition to salmon and herring, Boardwalk has a wide diversity of other fish, in particular flatfish, which can grow large and are an excellent food fish, and rockfish and cods, the latter of which can grow up to a meter, and are also excellent food fish. Phillips Point, which has the

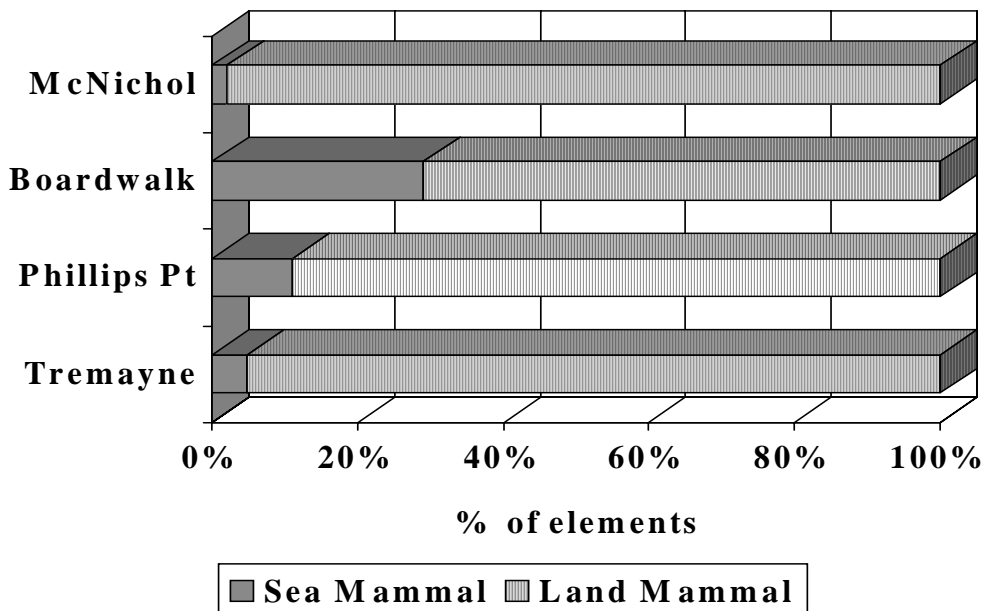


Figure 4.
Proportion of sea mammal and land mammal elements at the 4 sites

largest herring fishery of the three sites, also has a dominance of flatfish and sculpins. Sculpins are smaller, spiny fish, although some can grow to over 50 cm. These may have been used for bait. Phillips Point also has eulachon, which was very important historically for oil, but whose bones are rarely recovered because it is small (up to 23 cm in length). Tremayne Bay, in addition to salmon and herring, has a preponderance of dogfish and greenlings. Dogfish skin can be used for sandpaper, as well as being a food fish, and greenlings can grow to over 50 cm and are a good food fish.

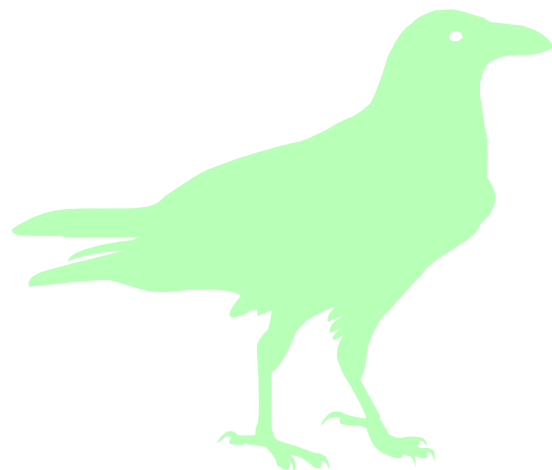
Figure 4 shows the differences in representation between the proportions of sea and land mammals between the sites. Boardwalk clearly has the greatest proportion of sea mammals, which are primarily sea otters and harbour seals. The other two sites contain mainly land mammals, particularly deer and dogs. Boardwalk has a greater diversity of land mammals than the other sites, including deer, dogs, beaver, porcupine and mink. Only Boardwalk has a diversity of birds, including ducks, perching birds, grebes, loons and alcids.

While identification of the fauna is still ongoing, several issues have manifested themselves which will be tracked throughout the analysis. First, while earlier studies had not recovered small fish bones, our study indicates that these small fish – including herring, anchovy, eulachon - may be of great importance in the regional economy. Although 2.8 mm (1/8") mesh was used to screen some of the matrix in the 2000 excavations, it is increasingly apparent that even smaller mesh sizes are needed to accurately quantify the contribution of these potentially very important fish. Second, very clear differences are apparent in the faunas taken at the four sites. Whether these differences are due to

microenvironmental changes, economic disparities between groups, seasonality or a combination of these requires further analysis. Third, although numbers are still small, differences in abundance of certain mammals are seen throughout the sequence. If these trends prove to be real, factors such as environmental change and over-exploitation of certain groups must be examined, in conjunction with data on shellfish data. Full analysis of the Prince Rupert Harbour fauna is expected to take until early 2002.

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The Fauna from Cohoe Creek: An Early Shell Midden in Haida Gwaii

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The oldest site on Haida Gwaii (the Queen Charlotte Islands) with good bone preservation is Cohoe Creek on Masset Inlet, Graham Island. This site was investigated in 1988 by Ham (1990) and excavated by the Old Masset Village Council 10 years later. The site is a small shell midden on a raised gravel beach deposit 11 m above current sea level. Unfortunately it served as a source of gravel for the Ministry of Highways and has been extensively modified

for gravel extraction (Figure 1).

Ham undertook an archaeological impact assessment (AIA) of the site in February during very inclement weather; snow and frozen soil, followed by rain. This limited his investigation options! As a result he took several column samples, dug a large trench with a back hoe and collected bones and artifacts from the surface. Ham reported dates of 6150 ± 70 RCYBP¹ to 4990 ± 100 RCYBP (Ham 1990:206-207). A small amount of faunal material was recovered from the surface including black bear, caribou, harbour seal, dolphin and a large bird (possibly goose or swan). In addition, there was an unidentified carangid, tentatively identified as scad (*Decapterus scombrinus*) or maybe jack mackerel (*Trachurus symmetricus*) at that time. Ham felt the remaining small portion

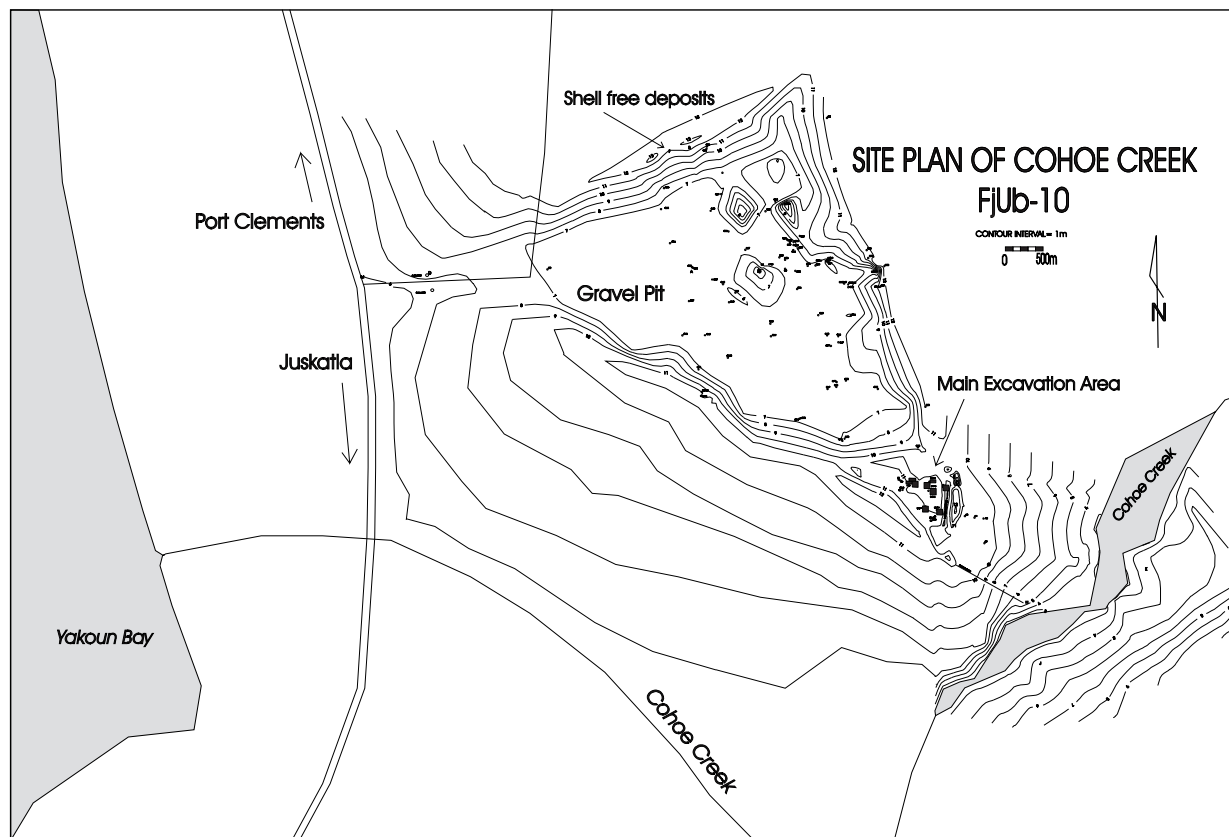


Figure 1 - Site plan of Cohoe Creek

of intact site was seriously threatened by erosion and further gravel removal and recommended further work be undertaken at the site.

Nothing was done with the site, which continued to deteriorate due to erosion and gravel removal, until Christensen presented a proposal to the Old Massett Village Council to undertake an excavation of the site. Her proposal was accepted and in the summer of 1998 excavation began (no problems with snow and frozen midden this time!). The project crew excavated 10 units and a series of auger tests. A large series of dates were taken from the excavation area which range between 4400 BP and 5700 BP, confirming the early dates Ham had found. The earliest date recovered during the 1998 work, 6980 BP, came from an exposed stratigraphic layer at the north end of the site which did not contain any visible fauna.

The analysis of the fauna from Christensen's excavation is still on-going, although the identifications are now complete. Table 1 gives a list of the fauna recovered in 1988 and 1998. In all, about 8000 bones were examined, of which 58% are fish, 37% are mammal and 5% are birds. Considered collectively, the most dominant fish species are jack mackerel, about 31% of all the fish elements, followed very distantly by salmon, 1.7%, and flatfish at 1.5%. Ducks dominate the birds with 18% of the assemblage. Most of the mammal bones are unidentifiable, but caribou makes up almost 3% of the assemblage, followed by black bear at slightly over 1%.

There is a hint that the caribou and jack mackerel are found mainly in the older parts of the site. Confirmation of this will have to wait for completion of the analysis, which will be published as Christensen's MA thesis from Simon Fraser University.

Large numbers of the same type of carangid bones recovered by Ham were excavated in 1998. Christensen and I have examined them carefully and concluded that these are jack mackerel (*Trachurus symmetricus*), not scad. They come from individuals that are substantially larger than the 27 cm specimen in the University of Victoria's comparative collection. The maximum recorded size of jack mackerel is 81 cm (Eschmeyer and Herald 1983:211) and the fish in Coho Creek may be of that size. Ham suggests their presence in the area indicates warmer marine temperatures than are found today (ibid:211). However, Eschmeyer and Herald (ibid.) give the jack mackerel range as southeast Alaska to Baja and state "larger individuals often move inshore and north in the summer". Neave and Hanavan (1960:229) using survey data collected in 1956 and 1957 show jack mackerel moving north into the Gulf of Alaska during the summer, possibly reaching the latitude of Haida Gwaii by July, definitely by August and September. Therefore it is not necessary to have warmer marine temperatures for the jack mackerel to be present. However, they do seem to be a strong seasonal indicator, probably having been caught in late summer. Dawson (1993:104) observed in 1878 that mackerel (probably the common variety) were found in the waters of Haida Gwaii but were not an important part of the Haida diet. It is interesting that there is no record of the jack mackerel in Masset Inlet in historic times.

The caribou bones from this site are of particular interest, because caribou is now extinct on Haida Gwaii. Shackleton suggests the last Dawson's caribou died "shortly after 1910, or in the early 1920's" (1999:180). This sub-species of woodland caribou is described as a small animal, close to the size of a coast deer with poorly developed antlers (Cowan and Guiget 1978:386),

but the description is based on very few specimens. It is variably classed as *Rangifer tarandus dawsoni* (see Shackleton 1999) or *Rangifer dawsoni* (see Cowan and Guiget 1978). The caribou bones recovered from Cohoe Creek are not from small individuals. The specimens are very similar in size to the modern female woodland caribou specimen used in the identifications. Caribou bones recovered from the more recent Bluejackets Creek site (4300 to 2000 BP) also appear to be similar in size to modern caribou (Severs 1974:198). It is quite clear there is no indication of dwarfing of the caribou at either of these sites, so it must have occurred in very recent times and quite quickly. Hopefully work on some more recent sites will determine when this dwarfing took place. This also suggests that calling these archaeological specimens Dawson's caribou is inappropriate, as they do not match the description of the type specimen.

There are few other faunal assemblages from Haida Gwaii to compare with Cohoe. I have identified the bones from a series of sites excavated by Acheson on and around Kunghit Island, in the southern end of Haida Gwaii, dating generally from the last 2000 years (Acheson 1998). The faunal assemblages from these sites were quite consistent. Generally, rockfish and salmon are the common fish species (ibid:48). Harbour seal and sea otter are the most commonly caught mammal species and small alcids are the dominant birds (ibid:56). The fish are rather strikingly different between Cohoe and these Kunghit Island sites with the dominance of jack mackerel and complete lack of rockfish at Cohoe Creek. In fact, Cohoe Creek appears to be the only archeological site in British Columbia with jack mackerel present, much less as the dominant fish species². The difference in the mammals is also dramatic, but perhaps less surprising. There is no

indication that caribou was ever present on Kunghit Island, so its lack is expected. I would have predicted more sea mammals at Cohoe Creek based on the Kunghit Island sites' patterns. Clearly they are not missing completely from Cohoe Creek, but land mammals dominate. I expect the presence of ducks at Cohoe Creek and alcids in the Kunghit sites relates to the different environments. The area of Cohoe Creek is substantially more protected providing better habitat for ducks, while the Kunghit Island habitat provides extensive habitat for breeding colonies of alcids. Explanations of the differences in the fish assemblage will have to wait for more data. We need to know if jack mackerel are found in other sites from the same area and/or time period, or if their presence is more wide spread in time and place. As usual, we hope for more excavation to help answer these questions.

Table 1:

Common loon	<i>Gavia immer</i>
Pacific loon	<i>Gavia pacifica</i>
Red-necked grebe	<i>Podiceps grisegena</i>
Medium grebe	Podicipedidae
Pelagic cormorant	<i>Phalacrocorax</i>
Medium cormorant	<i>Phalacrocorax sp.</i>
Canada goose	<i>Branta canadensis</i>
Diving duck	Anatidae
Hooded merganser	<i>Lophodytes cucullatus</i>
Mallard	<i>Anas platyrhynchos</i>
White-winged scoter	<i>Melanitta fusca</i>
Surf scoter	<i>Melanitta perspicillata</i>
Scoter	<i>Melanitta sp.</i>
Small, Medium and Large duck	Anatidae
Blue grouse	<i>Dendragapus obscurus</i>
Common murre	<i>Uria aalge</i>
Medium sized alcid	Alcidae
Small songbird	Passeriformes
Skate sp.	<i>Raja sp.</i>
Dogfish	<i>Squalus acanthias</i>
Pacific herring	<i>Clupea harengus</i>

Salmon *Oncorhynchus* sp.
 Pacific cod *Gadus macrocephalus*
 Pollock *Theragra chalcogramma*
 Jack mackerel *Trachurus symmetricus*
 Staghorn sculpin *Leptocottus armatus*
 Great sculpin *Myoxocephalus polyacanthocephalus*
 Plain sculpin *Myoxocephalus jaok*
 Three-spine stickleback *Gasterosteus aculeatus*
 Rock sole *Lepidopsetta bilineata*
 Halibut *Hippoglossus stenolepis*
 Flatfish Pleuronectiformes

Dog *Canis familiaris*
 Shrew sp. *Sorex* sp.
 Deer mouse *Peromyscus maniculatus*
 Porcupine? *Erethizon dorsatum*
 Dolphin or Porpoise Delphinidae
 Harbour seal *Phoca vitulina*
 Large pinnipedia Pinnipedia
 Black bear *Ursus americanus*
 River otter *Lutra canadensis*
 Sea otter *Enhydra lutris*
 Caribou *Rangifer cf. tarandus*

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¹ This early date came from the shell free rich organic deposits near the base of the site.

² One jack mackerel vertebra was recovered from a shovel test in Naden Harbour, Haida Gwaii, in a site of a comparable age with Cohoe Creek (Stafford and Christensen 2000).

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