Toward a Historical Ecology of Pinniped and Sea Otter Hunting Traditions on the Coast of Southern British Columbia

Iain McKechnie and Rebecca J. Wigen

Marine mammals (pinnipeds, cetaceans, and sea otters [Enhydra lutris]) have been important to First Nations people in coastal British Columbia for millennia, but their archaeological distribution is poorly known. While archaeological evidence of marine mammal hunting is known for numerous locations over the past 10,000 years of human occupation on the British Columbia Coast (e.g., Carlson 2003; Cannon 1991; Fedje et al. 2005; Matson 1976), it is remarkable that few studies have examined archaeological evidence of mammalian hunting traditions on broad regional and/or temporal scales. Considering the importance of these animals to the modern marine ecosystem, understanding the long-term human use and past distribution of marine mammals can add considerable perspective to contemporary knowledge of these ecologically important species and this highly valued marine ecosystem (cf. Jackson et al. 2001; Lotze and Worm 2009; Pitcher 2005).

The occurrence of marine mammal bones in archaeological contexts reflects the direct use and long-term occupation of this region by coastal First Nations people. Such occurrences indicate that humans have been participants in this ecosystem for at least the past 10,000 years and as such, likely directly and indirectly affected the distribution, growth, behavior, and relative densities of marine mammals and their prey (cf., Crockford et al. 2002; Etnier 2002a; Gifford-Gonzalez et al. 2005; Lyman 2003a). In this chapter, we compile archaeological data on the distribution of pinnipeds and sea otters from archaeological assemblages along the coast of southern British Columbia. We evaluate the spatial and temporal extent of human hunting and explore the possible influence humans may have had on this aspect of the marine environment and, conversely, discuss the potential significance that hunting these animals had to First Nations cultures in the region. Drawing on archaeological and ethnographic...
information, we ask three questions regarding the use of marine mammals by First Nations people over the past 8000 years:

- What marine mammals did aboriginal people in southern British Columbia most commonly utilize?
- How similar or how different are species occurrences and proportions relative to today?
- Is there evidence of specialized or regional hunting traditions and if so, what might have been the potential impacts of these activities on the ancient marine ecosystem?

CONTEXT

Recent assessments of Northwest Coast archaeology have emphasized the need to adopt a regional approach to characterizing patterns of aboriginal resource use (Butler and Campbell 2004; Cannon 2001). In discussing the role of salmon on the central Northwest Coast, Cannon has noted:

More important than improved recovery and analysis of fish remains from individual site locations is the pressing need to expand research strategies beyond the individual sites to encompass a variety of site locations within specific regions. This is the only way to gain a better appreciation of the extent of regional, seasonal, and longer-term temporal variability in the focus and intensity of local fisheries. (2001:185)

Although Cannon’s suggestion is directed toward the archaeological assessment of fisheries, it is broadly applicable to archaeological research on the Northwest Coast. To date, only a few regional studies of indigenous resource use have been conducted (Butler and Campbell 2004; Crockford et al. 2002; Hanson 1991; Hanson and Kusmer 2001; Hebda and Frederick 1990; Hobson and Driver 1989; Moss 2008; Orchard and Clark 2005). These efforts have provided a host of insights but have been hindered by the small number of published zooarchaeological studies, a methodological concern on sampling adequacy and taxonomic identification, and a focus on characterizing the “full range” of animal consumption, including birds, fish, mammals, and shellfish (e.g., Croes and Hackenberger 1988; Driver 1993; Hanson 1991; Mitchell 1990). Additionally, many of these studies have focused on demonstrating quantitative differences in tabular form making it difficult to assess the potential continuity and spatial associations between adjacent sites and regions.

In this chapter, we adopt an explicitly spatial approach to examining the archaeological expression of aboriginal hunting practices in southern British Columbia, focusing specifically on pinnipeds and sea otters. We explore compositional patterns using zooarchaeological assemblage data from 75 temporally distinct assemblages from 58 sites spanning the past 8000 years. We group assemblages into four broad temporal categories variously corresponding to broadly defined archaeological cultural historical “periods” (300–1200; 1200–2400; 2400–5000; 5000–8000 calibrated years BP) following Lepofsky et al. (2005, 2007) and Ames and Maschner (1999). These data provide context for considering the regional extent and potential influence that First Nations hunting practices had on the marine and terrestrial environments of southern British Columbia.

THE MODERN MARINE ECOSYSTEM

Our study area includes the western and eastern coasts of southern Vancouver Island, the Gulf Islands, and the British Columbia mainland and adjacent areas on the Olympic Peninsula in Washington State (approximately 40,000 km²; Figure 7.1). This region is temperate with occasional winter snowfall at sea level, high annual rainfall on western Vancouver Island (260–340 cm), and much lower rainfall on southeastern Vancouver Island and the Gulf Islands (70–110 cm; Environment Canada 2009). The terrestrial environment is heavily forested with the densest forest cover on western Vancouver Island. The least densely forested areas are on southeastern Vancouver Island and the Gulf.
The contemporary distribution of pinnipeds on the southern British Columbia coast is represented by six species occupying a range of habitats and exhibiting seasonal fluctuations in abundance (Table 7.1). Harbor seals (*Phoca vitulina*) are the most numerous and ubiquitous species that are present year round (Department of Fisheries and Oceans 2010). Northern fur seals (*Callorhinus ursinus*) are slightly more abundant but do not come ashore and are found almost exclusively on the continental shelf off western Vancouver Island, primarily between December and May (Olesiuk 2009a:57). Steller sea lions (*Eumetopias jubatus*), while resident year round, do not have rookeries in the study area and are only seasonally present in the Salish Sea during winter and spring (Bigg 1988; Olesiuk 2009b). California sea lions (*Zalophus californianus*) are present in fewer numbers, and elephant seals (*Mirounga angustirostris*) migrate to the southern BC coast seasonally (Table 7.1). Elephant seals have recently established a year-round haul-out on Race Rocks on the southern tip of Vancouver Island where at least two elephant seals pups have been born in 2009 and 2010 (Racerocks.com 2010).

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The contemporary British Columbia sea otter population consists of 4182 animals (Nichol et al. 2009).
<table>
<thead>
<tr>
<th>Species Name</th>
<th>NORTHERN FUR SEAL</th>
<th>HARBOR SEAL</th>
<th>STELLER SEA LION</th>
<th>CALIFORNIA SEA LION</th>
<th>ELEPHANT SEAL</th>
<th>SEA OTTER</th>
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<tr>
<td>Callorhinus ursinus</td>
<td>35–45</td>
<td>58</td>
<td>200–300</td>
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<td>Eumetopias jubatus</td>
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<td>Zalophus californianus</td>
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<td>Mirounga angustirostris</td>
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<td>May–June, Central Northern BC</td>
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<td>May–July, California and Oregon</td>
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<td>December–March, California and Mexico</td>
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<td>Year-round with peak in Spring</td>
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<td>Modern Seasonal Occurrence in BC</td>
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<td>Resident in BC year-round</td>
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<td>Estimated Contemporary Population in BC</td>
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<td>123,000</td>
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<td>105,000</td>
<td>18,400–19,700</td>
<td>2,000–3,000</td>
<td>Fewer than 100</td>
<td>4712</td>
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<td>Management Status in Canada (2009) (COSEWIC)</td>
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<td>Threatened</td>
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<td>Not at Risk</td>
<td>Special Concern</td>
<td>Not at Risk</td>
<td>Not at Risk</td>
<td>Special Concern</td>
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<tr>
<td>IUCN Red List Status (2009)</td>
<td>Vulnerable</td>
<td>Least Concern</td>
<td>Endangered</td>
<td>Least Concern</td>
<td>Least Concern</td>
<td>Endangered</td>
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</tbody>
</table>
logically important animals is poorly known (due in part to the paucity of archaeological
data and lack of long-term ecological studies), and this issue is a contemporary research con-
cern for ecologists and managers throughout the northern Pacific (e.g., Springer et al. 2003; Misarti et al. 2009).

The early “contact period” on the Northwest Coast (ca. AD 1774–1812) focused on the trade
of sea otter pelts obtained from the western
cost of Vancouver Island as well as the north-
ernor and central British Columbia coast (Busch
and Gough 1997; Dick 2006). Sea otter pelts
were recognized as wealth items and chiefly
regalia within aboriginal communities prior to
contact with European trading vessels. Aborigi-
nal exchange of pelts for highly valued Eu-
ropean trade goods was therefore immediately
incorporated into the indigenous economy and
caused a large expansion of this par tic u lar hunt-
ing activity (Dick 2006; Lutz 2008). Over a few
decades, the burgeoning trade led to an in-
creasing scarcity of sea otters and increasing
conflict between Euro pe an and American trad-
ers and First Nation communities. Euro pe an
trading ships ceased to seek sea otter pelts on
the southern British Columbia coast after 1812
following a series of dramatic incidents involv-
ing the destruction of Euro pe an ships and crew
as well as reprisal attacks on aboriginal villages
(e.g., McMillan 1999:188).

After a period of several decades of infre-
quent interaction, the Euro pe an colonial pres-
ence on the coast increased substantially dur-
ing the mid 19th century. From the 1880’s
through the early 1900’s, commercial demand
for seal pelts in the European market fueled a
commercial sealing industry, which targeted
northern fur seals off the British Columbia
Dozens of schooners operating out of Victoria
and Seattle employed hunters from First Na-
tions communities on western Vancouver Is-
land and the Olympic Peninsula to travel off-
shore where hunters would launch traditional
dugout canoes and use harpoons to approach
and capture fur seals “sleeping” in the surface

HISTORIC CHANGES TO THE
MARINE ECOSYSTEM

Marine mammals, particularly the trade of
their highly valued pelts, were central through-
out the process of early historic contact between
First Nations and Euro pe ans on the northwest
cost of North America (Fisher 1977). Sea otters,
northern fur seals, and then whales sequen-
tially became the focus of international com-
mercial industries, which rapidly diminished
these culturally and ecologically significant
animals over several decades. The correspond-
ing impact of the sudden removal of these eco-
HUNTING TRADITIONS IN BRITISH COLUMBIA 133
waters (Swan 1883). In 1880 alone, over 12,000 fur seals were harvested off the coast of Vancouver Island (Swan 1887:397). Growing international pressure concerning the declining stocks of fur seals at their breeding grounds in the Bering Sea in the late 19th century (Elliot 1886) eventually resulted in one of the first international treaties protecting marine wildlife in 1911, and ended the commercial harvest of fur seals in Canadian waters (Gay 1987).

Also during this time, a nascent whaling industry developed on the British Columbia coast during the mid-19th century but expanded significantly after 1905, regionally diminishing whale populations, particularly sperm whales (*Physeter macrocephalus*), fin whales (*Balaenoptera physalus*), and humpbacks (*Megaptera novaeangliae*; Gregr et al. 2000). Nonmigratory populations of humpback whales residing in coastal inlets were among the first whales targeted (Merilees 1985; Webb 1988). Whaling continued on the British Columbia coast until it was halted in 1967.

**HISTORIC CHANGES AMONG COASTAL FIRST NATIONS**

The dramatic changes described above occurred in the context of tumultuous and tragic social, economic, and demographic changes within aboriginal communities over the last two centuries. Particularly devastating were introduced diseases (particularly smallpox and measles), which swept through the coastal population in the 1790s and later in the 1850s and 1860s (Boyd 1999). These epidemics severely reduced the aboriginal population and correspondingly destabilized the highly structured social and political networks and dramatically reduced the scale and extent of the aboriginal subsistence economy. A large influx of European and Asian colonists in the mid-to-late 19th century introduced a host of new opportunities and challenges for sustaining and generating wealth in aboriginal communities. Many aboriginal people began to participate in the developing wage economy in forestry, fisheries, and agriculture on a seasonal basis (Lutz 2008). Among the highest wages were those offered to aboriginal hunters employed in the fur seal industry who earned seasonal incomes well above European counterparts (Lutz 2008). This industry persisted until the 1911 international fur seal treaty between America, Japan, Russia, and Canada mandated a halt to this once central economic activity.

Also during the late 19th century, anthropological fieldworkers began to document aboriginal peoples of the coast (e.g., Boas 1887). Numerous researchers compiled detailed descriptions and oral historical accounts of aboriginal lifeways including marine mammal hunting practices and rituals associated with hunting (e.g., Sapir and Swadesh 1939; Waterman 1920). Whaling was a particularly honored tradition among Nuu-chah-nulth peoples on the west coast of Vancouver Island and Makah peoples on the Olympic Peninsula (McMillan 1999), but sealing was also a respected skill in coastal aboriginal communities on both the east and west coasts of Vancouver Island (Drucker 1951; Elemendorf 1960; Suttles 1987a). Hunters were typically chiefs or men of high status who underwent elaborate ritual and physical preparation (Arima 1988; Drucker 1951:168; Elmendorf 1960:86; Suttles 1987a; Waterman 1920). Hunter’s wives were obligated to observe ritual practices prior to and during the hunt and contributed labor to butchering and cooking as well as preparing hunting technology (e.g., preparing sinew, seal-skin floats, cedar bark rope, etc.). Hunting took place from dugout canoes using harpoon technology with seal-skin floats or from land using clubs. A host of historic and ethnographic accounts are available for further investigating hunting practices and techniques, some of which are described further in the sections below.

**METHODS**

To investigate the regional expression of marine mammal hunting practices, we compiled available zooarchaeological data from academic
Researchers at the University of Victoria and the RBCM have assembled a comprehensive comparative collection of vertebrates in the North Pacific including marine and terrestrial mammals from multiple individuals of different age and sex classes. Other universities have less-comprehensive collections but include common mammals like deer and harbor seal. Identification and quantification criteria have been reviewed and standardized for consistency. For identifications that appear questionable, as in the case of northern fur seals identified from Burrard Inlet in North Vancouver (i.e., Galdikas-Brindamour 1972), revised assessments of earlier identifications are utilized (cf. Trost 2005).

Faunal remains from the majority of sites included in the analysis were recovered from controlled excavations using standard ¼” (6.35 mm) mesh. However, in one instance of salvage data recovery, mammal bones were collected by hand from excavated sediments (Site 46, Table 7.2). Mammal remains recovered from fine-mesh bulk samples were not included in the analysis due to the small sample sizes and their lack of comparability with fauna from larger volumes of excavated sediment. In most cases, mammal bones were not recovered or were present in very low numbers in these fine-mesh bulk samples.

Faunal identification data are quantified by number of identified specimens (NISP), which includes individual skeletal elements or fragments that can be confidently attributed to taxonomic categories of family-, genus-, or species-level designation (e.g., cervidae, deer, or mule deer). Highly fragmented remains that cannot be confidently assigned to family, genus, or species level are not included in the analysis (e.g., unidentified sea mammal). Quantification of relative abundance is evaluated by comparing the percentage of identified specimens (NISP) from individual taxonomic categories to all other positively identified specimens (e.g., %NISP of pinnipeds).

Species- or genus-specific taxonomic identifications are shown in Table 7.2, but for the
TABLE 7.2

Site Names, Locations, References, and Number of Identified Specimens (NISP) Used in the Analysis.
All Mammal Totals Exclude Whales and Domestic Dogs.

<table>
<thead>
<tr>
<th>NUM.</th>
<th>REGION</th>
<th>SITE #</th>
<th>PERIOD</th>
<th>SITE NAME</th>
<th>REFERENCE</th>
<th>HARBOR S.</th>
<th>STELLER</th>
<th>N. FUR SEAL</th>
<th>C. SEA LION</th>
<th>ELEPHANT SEAL</th>
<th>SEA OTTER</th>
<th>TERRESTRIAL MAMMALS</th>
<th>ALL MAMMALS</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>ecVI</td>
<td>DjSf-13</td>
<td>1200–2400</td>
<td>Buckley Bay</td>
<td>Wigen 1980</td>
<td>4</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>221</td>
<td>235</td>
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<tr>
<td>2</td>
<td>ecVI</td>
<td>DjSf-14</td>
<td>1200–2400</td>
<td>Tsable River</td>
<td>Wigen 1980</td>
<td>2</td>
<td>4</td>
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<td>194</td>
<td>203</td>
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<tr>
<td>3</td>
<td>ecVI</td>
<td>DkSg-2</td>
<td>300–1200</td>
<td>Sandwick midden</td>
<td>Capes, 1964:90</td>
<td>5</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>66</td>
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<tr>
<td>4</td>
<td>ecVI</td>
<td>DiSc-1</td>
<td>300–1200</td>
<td>Little Qualicum River</td>
<td>Bernick and Wigen 1990</td>
<td>18</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>243</td>
<td>263</td>
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<td>5</td>
<td>ecVI</td>
<td>DiSc-26</td>
<td>1200–2400</td>
<td>Qualicum Beach Golf Course</td>
<td>Willows et al. 2008:75</td>
<td>0</td>
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<td>6</td>
<td>ecVI</td>
<td>DhSb-3</td>
<td>1200–2400</td>
<td>Dogwood St., Parksville</td>
<td>Wilson et al. 2006:58</td>
<td>0</td>
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<td>ecVI</td>
<td>DhRx-16</td>
<td>1200–2400</td>
<td>Departure Bay</td>
<td>Wilson and Crockford 1994:118</td>
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<td>8</td>
<td>scVI</td>
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<td>McKechnie, 2004:51, table 19</td>
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<td>9</td>
<td>scVI</td>
<td>DcRu-2</td>
<td>300–1200</td>
<td>Esquimalt Lagoon</td>
<td>Hanson 1991, table 6 citing Stevenson 1978</td>
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</tr>
<tr>
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<td>DhSe-2</td>
<td>1200–2400</td>
<td>Shoemaker Bay Mid</td>
<td>Calvert and Crockford 1982:186</td>
<td>13</td>
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<td>DhSe 2</td>
<td>2400–5000</td>
<td>Shoemaker Bay Early</td>
<td>Calvert and Crockford 1982:186</td>
<td>7</td>
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<td>46</td>
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<td>300–1200</td>
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<td>7</td>
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<td>8</td>
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<td>300–1200</td>
<td>Tsuxwikwaada</td>
<td>McKechnie 2005, table 1</td>
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<td>0</td>
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<td>48</td>
<td>WA</td>
<td>45CA213</td>
<td>1200–2400</td>
<td>Hoko R. Wet/Dry</td>
<td>Croes 1995:71</td>
<td>7</td>
<td>1</td>
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<td>45CA21</td>
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<td>Wigen 2005, table 4.4</td>
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<td>MnInd</td>
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<td>5000–8000</td>
<td>Saltery Bay</td>
<td>Pegg et al. 2007, table 20</td>
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<td>DkSb-30</td>
<td>2400–5000</td>
<td>Saltery Bay</td>
<td>Pegg et al. 2007, table 20</td>
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<th>PERIOD</th>
<th>SITE NAME</th>
<th>REFERENCE</th>
<th>HARBOR S.</th>
<th>STELLER SL</th>
<th>N. FUR SEAL</th>
<th>C. SEA LION</th>
<th>ELEPHANT SEAL</th>
<th>SEA OTTER</th>
<th>TERRESTRIAL MAMMALS</th>
<th>ALL MAMMALS</th>
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<tr>
<td>51.1</td>
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<td>DkSb-30</td>
<td>300–1200</td>
<td>Saltery Bay</td>
<td>Pegg et al. 2007:table 20</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>52</td>
<td>Gulf Is</td>
<td>45-SJ-24</td>
<td>300–1200</td>
<td>English Camp</td>
<td>Pegg 1999:69</td>
<td>20</td>
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<td>DkSf-4</td>
<td>300–1200</td>
<td>Comox Harbour Site</td>
<td>Simonsen 1990:35, table 11</td>
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<td>54</td>
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<td>DfSg-2</td>
<td>300–1200</td>
<td>Aguilar House</td>
<td>English 2006:28</td>
<td>2</td>
<td>4</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>36</td>
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<tr>
<td>55</td>
<td>Gulf Is</td>
<td>DgRv-2</td>
<td>1200–2400</td>
<td>Shingle Point</td>
<td>Matson et al. 1999:61–71</td>
<td>4</td>
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<td>116</td>
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<td>56</td>
<td>MnInd</td>
<td>DhRt-6</td>
<td>2400–5000</td>
<td>Locarno Beach</td>
<td>Brolly and Muir 1993:52</td>
<td>1</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td>68</td>
</tr>
<tr>
<td>57</td>
<td>Gulf Is</td>
<td>DfRu-3</td>
<td>1200–2400</td>
<td>Harbour House, Saltspring</td>
<td>Brolly et al. 1993:72, table 8</td>
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<td>1</td>
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<td>0</td>
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</tr>
<tr>
<td>58.1</td>
<td>ecVI</td>
<td>DiSe-10</td>
<td>300–1200</td>
<td>Denman - Southern Rckshlr</td>
<td>Eldridge 1987:5-57, tables 5–9</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>7</td>
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</tr>
<tr>
<td>58.2</td>
<td>ecVI</td>
<td>DiSe-10</td>
<td>2400–5000</td>
<td>Denman - Northern Rckshlr</td>
<td>Eldridge 1987:5-59, tables 5–10</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>57</td>
<td>59</td>
</tr>
<tr>
<td>58.3</td>
<td>ecVI</td>
<td>DiSe-10</td>
<td>2400–5000</td>
<td>Denman - Blufftop</td>
<td>Eldridge 1987:5-67, table 5–16</td>
<td>1</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>26</td>
<td>27</td>
</tr>
</tbody>
</table>

**NOTE:** ecVI-East Coast Vancouver Island, scVI-South Coast Vancouver Island, Gulf Is-Gulf Islands, wcVI-West Coast Vancouver Island, MnInd-Mainland of British Columbia, WA-Washington State.
Age and sex classification (based on epiphyseal fusion, eruption and wear of teeth) is not consistently recorded for most of the assemblages in this study. However, sex information is available for a small selection of the examined sites for adult-sized Steller sea lions (summarized in Table 7.3). Ideally, future analyses will examine incremental skeletal structures, such as growth lines in nondeciduous teeth as well as measuring the dimensions of diagnostic elements, which has been published for a handful of sites (e.g., Crockford et al. 2002; Etnier 2002a).

The compiled assemblage data have been entered into a geographic information system (GIS) and plotted over a series of geospatial layers depicting the major river drainages, the purpose of this analysis, specimens have been lumped into larger categories of “marine” and “terrestrial” mammals. The marine category includes all pinnipeds (seals and sea lions), delphinids (porpoises, dolphins), and sea otters. River otters (*Lontra canadensis*) are also included in the marine mammal category, as they inhabit coastal waters throughout the study area (Banfield 1974). Whales have been excluded due to the highly fragmentary nature of these large elements, which make identification and quantification problematic (Huelsbeck 1988; Monks 2001). Canids and domestic dogs (the only domesticated animal in the region) have been excluded from this analysis since it is not clear they are used for dietary consumption (Crockford 1997a).

### TABLE 7.3

**Sex Distribution of Steller Sea Lion Remains from Selected Sites**

<table>
<thead>
<tr>
<th>REGION</th>
<th>SITE</th>
<th>TOTAL NISP</th>
<th>MALE</th>
<th>FEMALE</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecVI</td>
<td>DiSe-7, Deep Bay</td>
<td>1</td>
<td>1</td>
<td></td>
<td>Wilson et al. 2004a</td>
</tr>
<tr>
<td>scVI</td>
<td>DcRt-16, King George Terrace</td>
<td>4</td>
<td>4</td>
<td></td>
<td>Wilson et al. 2004b:94</td>
</tr>
<tr>
<td>scVI</td>
<td>DdRu-5, Pat Bay</td>
<td>10</td>
<td>10</td>
<td></td>
<td>Kanipe et al. 2007:269</td>
</tr>
<tr>
<td>scVI</td>
<td>DcRu-136, Esquimalt Lagoon</td>
<td>2</td>
<td>2</td>
<td></td>
<td>Wigen 2002</td>
</tr>
<tr>
<td>Gulf Is</td>
<td>DfRv-106, Galiano Island</td>
<td>1</td>
<td>1</td>
<td></td>
<td>Mason et al. 1995:22</td>
</tr>
<tr>
<td>wcVI</td>
<td>DiSo-9-II, Hesquiat</td>
<td>1</td>
<td></td>
<td>1</td>
<td>Calvert 1980:155</td>
</tr>
<tr>
<td>wcVI</td>
<td>DiSo-1-I, Hesquiat</td>
<td>13</td>
<td>2</td>
<td></td>
<td>Calvert 1980:156</td>
</tr>
<tr>
<td>wcVI</td>
<td>DiSo-1-II, Hesquiat</td>
<td>1</td>
<td>1</td>
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<td>Calvert 1980:157</td>
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<td>DiSo-1-III, Hesquiat</td>
<td>12</td>
<td>3</td>
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<td>Calvert 1980:158</td>
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<td>DiSo-1-IV, Hesquiat</td>
<td>14</td>
<td>2</td>
<td>1</td>
<td>Calvert 1980:159</td>
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<td>DjSf-100, Little Beach</td>
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<td>4</td>
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<td>McKechnie 2007a:30</td>
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<tr>
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<td>DfSi-16, Ts’ishaa</td>
<td>20</td>
<td>7</td>
<td></td>
<td>Unpublished data in</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Frederick and Crockford</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2005</td>
</tr>
<tr>
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<td>DfSh-7, Huu7ii</td>
<td>9</td>
<td>7</td>
<td>2</td>
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<td>Frederick et al. 2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>96</td>
<td>44 (90%)</td>
<td>5 (10%)</td>
<td></td>
</tr>
</tbody>
</table>

Total (96) (5 (10%))

Age and sex classification (based on epiphyseal fusion, eruption and wear of teeth) is not consistently recorded for most of the assemblages in this study. However, sex information is available for a small selection of the examined sites for adult-sized Steller sea lions (summarized in Table 7.3). Ideally, future analyses will examine incremental skeletal structures, such as growth lines in nondeciduous teeth as well as measuring the dimensions of diagnostic elements, which has been published for a handful of sites (e.g., Crockford et al. 2002; Etnier 2002a).
of academically driven research projects, while the remainder were cultural resource management projects mandated under heritage legislation in the province of British Columbia. The most recent temporal period (ca. 300–1200 cal BP) contains the greatest number of assemblages \( (N = 36) \), and this progressively decreases with assemblage age (1200–2400 cal BP, \( N = 26 \); 2400–5000, \( N = 11 \); 5000–8000, \( N = 2 \)). This trend reflects a sampling bias toward younger sites associated with modern sea levels and a lack of research devoted to locating and sampling earlier Holocene archaeological assemblages (cf. Fedje et al. 2004). Nine sites span multiple temporal periods whereas the remaining sites fall into one of the four broadly defined temporal periods (Table 7.2). Assemblage size (NISP) ranges widely from a low of 5 mammalian elements (Site 38) to a high of 51,937 (Site 50), but over 70% of the assemblages have more than 50 identified specimens. The largest assemblage from Ozette (Site 50) was the product of a decades-long collaborative project between the Makah tribe and a team of archaeologists from Washington State University (Huelsbeck 1994; Samuels and Daugherty 1991). Sites with small assemblages (<50 NISP)
years and shows a sharply defined regional difference in the use of marine mammals and terrestrial mammals between the west and east coasts of Vancouver Island. Sites show remarkable consistency, with terrestrial mammals comprising the majority of all mammalian assemblages. Sites on western Vancouver Island, in contrast, are composed primarily of assem-

are included in the analysis as they represent additional locations with confidently identified taxonomic information.

**SPATIAL AND TEMPORAL PATTERNING**

Figure 7.2 illustrates the relative abundance of marine and terrestrial mammals among all examined assemblages spanning the past 8000 years and shows a sharply defined regional difference in the use of marine mammals and terrestrial mammals between the west and east coasts of Vancouver Island. Sites show remarkable consistency, with terrestrial mammals comprising the majority of all mammalian assemblages. Sites on western Vancouver Island, in contrast, are composed primarily of assem-

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**Figure 7.3.** Relative composition of marine and terrestrial mammals (%NISP) for all sites in the study area according to temporal period.
is navigable for 10 km upstream but where the surf makes it hazardous to launch canoes in most conditions (Site 46). In the Salish Sea, sites that show the greatest percentage of marine mammals are in the Gulf Islands and the Saanich and Tsawwassen peninsulas (Sites 15–18, 21–24). Sites situated on the east coast of Vancouver Island show a consistently low percentage of blages with more than 75% marine mammals (Figure 7.2). Notable exceptions to this pattern occur at two sites on western Vancouver Island, which contain a higher percentage of terrestrial than marine mammals. One of these sites is a rockshelter in a sheltered area of Hesquiat Harbour (Site 35), and the other is located on a highly exposed linear coastline near a river that

FIGURE 7.3. (continued)
marine mammals relative to elsewhere in the Salish Sea. Shoemaker Bay (Site 45), a site at the head of an inlet, which deeply incises the western coast of Vancouver Island, has an assemblage dominated by terrestrial mammals that appears more similar to eastern Vancouver Island assemblages. Saltery Bay (Site 51), a multi-component site in the northern portion of the study area, shows a notably high percentage of marine mammals relative to other sites in the Salish Sea.

Figure 7.3 depicts the chronological sequence of the relative composition of marine and terrestrial mammals over the four distinct time periods. Terrestrial mammals represent a majority of the two earliest assemblages in the Salish Sea, and this pattern follows in subsequent time periods with the notable exception of Saltery Bay (Site 51). Similarly, sites on western Vancouver Island have a majority of marine mammals and this is consistently represented over the three temporal periods with available data (Figure 7.3). These persistent compositional patterns in regionally distributed mammal assemblages indicate remarkable continuity over long periods of time. However, temporal trends within particular sites are also apparent, although more subtle. Some individual sites have suggestive chronological changes in the relative composition of marine versus terrestrial mammals. For instance, Helen Point (Site 21) shows a relative decrease in marine mammal composition over three successive time periods, which speculatively correlates with greater terrestrial mammal composition on southeastern Vancouver Island (Sites 8–18). In contrast, sites on southwestern Vancouver Island and Washington State appear to show a progressive increase in marine mammal percentages over the three time periods (sites 34–50). While these trends are suggestive of regionalized subsistence practices, it is not within the scope of this paper to evaluate each of these possible local patterns in detail.

Figure 7.4 shows the same temporal sequence of analyses shown in Figure 7.3 but depicts only the relative composition of the three most common pinniped species (harbor seal, Steller sea lion, northern fur seal) and sea otter. This analysis purposefully excludes terrestrial and cetacean (delphinid) specimens, which correspondingly reduces sample size and alters the representation of relative percentage (i.e., %NISP refers to just these species). Nevertheless, this analysis indicates that assemblages on western Vancouver Island are predominantly composed of northern fur seal, followed by Steller sea lion and harbor seal. Northern fur seals are strikingly absent from all sites in the Salish Sea and harbor seals dominate the marine mammal assemblages in the Strait of Georgia, followed distantly by Steller sea lions. Sea otters are present at eight sites on western Vancouver Island and Washington and comprise substantial proportions of four of these assemblages (Sites 34, 36, 44, and 45). Sea otters are present at five sites in the Salish Sea dating to between 2400 and 300 yr BP (Sites 13, 23, 52, and 53), which contrasts with the findings of Hanson and Kusmer (2001), who observed a near absence of sea otters in this region. Where sea otters are present, they represent small proportion of the assemblages except for one small marine mammal assemblage (NISP = 4) that is composed entirely of sea otter (Site 13). Steller sea lions also are present at sites on southern and western Vancouver Island but are found in greater densities on western Vancouver Island and in lower percentages along the Salish Sea (Figure 7.4).

California sea lions are identified in only six sites in the study area, all on the exposed Pacific coast (Table 7.2). Elephant seals are similarly present in small numbers at four sites in the western portion of the study area (Sites 41, 42, 48, and 49). Guadalupe fur seals, whose skeletal morphology closely resembles the northern fur seal (Etnier 2002b), are only identified at one site (NISP/34) which also has the largest identified assemblage (Ozette, Site 50).

AGE AND SEX DATA

Due to the striking disparity between the archaeological and modern distributions of northern fur seal, age and sex data for this
once commercially significant species have been discussed elsewhere in great detail (Burton et al. 2001; Calvert 1980; Crockford et al. 2002; Etnier 2002a, 2007; Gifford-Gonzalez et al. 2005; Gustafson 1968; Moss et al. 2006; Newsome et al. 2007). These studies have identified adult males and females as well as immature pups less than 6 months of age in a variety of sites in the study area. Combining archaeological data from Ts’ishaa (Site 42) with historic accounts from schooner captains, aboriginal hunters, and merchants involved in the sealing industry of the 1880s (Swan 1883, 1887), Crockford et al. (2002:170) argue for the presence of a nonmigratory breeding population of fur seals capable of giving birth in kelp beds or kelp rafts at sea. Subsequent studies have used stable isotopes to posit the existence a mid-latitude breeding distribution in the Pacific Northwest (Newsome et al. 2007). However, definitive evidence of a terrestrially based northern fur seal rookery remains to be identified.

Age and sex data from few species other than fur seal have been compiled. For sites in the study sample, a small portion of Steller sea lion skeletal remains from a limited number of sites has been confidently sexed. Table 7.3 shows the breakdown of sexed elements for sites where the information was available from controlled excavations. Although the sample is small (NISP = 19), 95% of the sexed elements are from adult males, with only two elements out of 40 either unknown or female. This pattern is similar to data from the Oregon coast, which indicates that Steller sea lions from archaeological contexts are primarily adult males (Lyman 2003b). The incidence of females and/or juveniles of either sex are very low, with only one definitively female element found on southeast Vancouver Island (Table 7.3).

Additional Steller sea lion sex and age information comes from fauna collected from archaeological contexts during monitoring of construction projects (Table 7.3). Monitoring samples are collected without screening and have only general provenience. However, males dominate four large assemblages from the southern Salish Sea region. For example, at Patricia Bay (Site 18), at least 74 male Steller sea lion elements have been identified, in contrast to only one female and three juveniles of indeterminate sex (Wigen 2007:24). Explanation for this pattern of male dominance could relate to seasonal availability of Steller sea lions and the differential behavior of the females and males at rookeries and haul-out sites and/or preference on the part of the human hunters.

Steller sea lions breed at communal rookeries in northern British Columbia during the summer but spend the winter at haul-out sites throughout British Columbia (Olesiuk 2009b). Since the first survey in British Columbia in 1913 (Newcombe and Newcombe 1914), the most southerly sea lion breeding rookery is located on the north end of Vancouver Island. Nonbreeding animals of both sexes use a limited number of established year-round haul-outs found mainly on the west coast of Vancouver Island. In the winter, individuals of both sexes use a wider range of haul-outs, including the Strait of Georgia and southern Vancouver Island. This pattern suggests both males and females should be available to hunters in the winter, so it appears seasonal distribution does not explain the hunting pattern.

Recent studies of the behavioral responses to human disturbance of hauled-out Steller sea lions note that females and pups are the first to leave, followed by the subadult males and, finally, the bulls (COSEWIC 2003; Szaniszlo 2005). The dominance of males in the archaeological sites may be a result of this behavioral pattern, with the males being easier for the hunters to target (Lyman 2003b). Additionally, haul-outs of “bachelor males” are commonly present near rookeries and may have also been targeted by hunters. The extremely large size of males and these behavioral characteristics suggest that males were hunted while onshore rather than offshore, as documented for fur seals.

Harbor seals and sea otters are more difficult to sex, as sexual dimorphism is less extreme. In most cases, no information has been recorded about the sex of individuals. Age for harbor seals has been recorded in a few site
gesting they may have been moderately abundant in the ancient environment. Elephant seals, California sea lions, and Guadalupe fur seals rarely occur in the assemblages, suggesting they were not commonly present at this latitude. However, taxonomic identifications of male California sea lions may be confused with female Steller sea lions (personal observations).
and, similarly, Guadalupe fur seals appear similar to northern fur seals (Etnier 2002b).

DISCUSSION

This analysis has identified distinct regional patterns in marine and terrestrial mammal assemblages from archaeological sites on western Vancouver Island and the Salish Sea. These differences provide a basis for inferring that aboriginal hunting practices dramatically differed in focus between these two regions. In particular, aboriginal peoples in the Salish Sea region did not hunt marine mammals to the same degree as was practiced by aboriginal peoples along the Pacific coast of Vancouver Island and Washington State. Rather, terrestrial mammals appear to be relatively more...
important in the Salish Sea region and relatively less so on the exposed Pacific coast.

These geographic patterns appear robust at least over the past 5000 years and have implications for a number of perspectives in anthropology and ecology. Of particular anthropological relevance is the apparent coherence and continuity of aboriginal marine and terrestrial hunting patterns within each of the two areas. This difference is most strongly apparent in the relative composition of marine versus terrestrial mammals (Figure 7.2 and Figure 7.3) and among the individual marine species (Figure 7.4). For specific localities within these two regions, variation in marine mammal use also appears to be spatially patterned, such as the slightly higher abundance of marine mammals in assemblages along southeastern Vancouver Island and in the Gulf Islands (Figure 7.2). These archaeological patterns are an outcome of the direct participation of generations of aboriginal people in this marine ecosystem. Such patterns reflect a continuity of skillful cultural knowledge and practical engagement with these marine environments (cf. Ingold 2000).

These regional differences are consistent with a host of ethnographic accounts and observations (e.g., Boas 1887; McMillan 1999; Suttles 1987b), which identify the aboriginal peoples who occupy these two regions as belonging to two culturally and linguistically distinct groups (Wakashan-speaking peoples [Nuu-chah-nulth, Ditidaht, Makah] and Salish-speaking peoples). During the postcontact era (ca. AD 1774–1860) and continuing among First Nations today, these cultural differences include distinct patterns of residence, conventions of artistic representation, ritual practice, and a host of other regionally unique forms of cultural expression (ibid.). Our analysis provides insight into an aspect of these rich cultural histories, suggesting that cultural distinctions between regions and cultural similarities within regions have great antiquity in regards to hunting practice. Indeed, since our data relate to an important subsistence activity (hunting), such regional expressions can be hypothesized to have contributed structure to cultural history and community identity. This is illustrated in a 1922 quote discussing the biography of Tom Sayach’apis (ca. 1835–1927), a respected cultural historian of the Tseshah, a Nuu-chah-nulth Nation on southwestern Vancouver Island:

Tom ate very little meat of land mammals in his early days. Indeed, like most of the [west] Coast people, he had a prejudice against deer meat and it was not until as a middle-aged man, he had come into contact with some of the deer hunting tribes of the interior of the island, that he learned to prize it, though to this day, venison has not for him the toothsome appeal of a chunk of whale meat. (Sapir 1922:304)

From an ecological perspective, such strong geographic patterning as seen through the lens of human hunting activity is relevant for considering the long-term ecological role of marine mammal species in the study area. Our data represent a unique and otherwise unattainable record of marine mammal abundance and distribution over the Holocene. This information helps contextualize contemporary marine mammal ecology by greatly extending temporal and geographic knowledge of these important species. In this regard, it is notable that the three most abundant pinnipeds in the archaeological assemblages (northern fur seals, harbor seals, and Steller sea lions) are also the three most numerically abundant in the contemporary environment (Table 7.1). The similarity in rank-ordered abundance between our archaeological data and contemporary pinniped population estimates indicates these three species have exhibited remarkable demographic resilience to human harvesting.

The stable long-term trends observed in the archaeological data stand in contrast to the dynamic historical events documented over the past 200 years that resulted in the rapid extirpation of the sea otter (ca. AD 1774–1811) and culling of pinniped populations (ca. AD 1868–1970). In this context, it seems important to note that the sudden cessation of marine mam-
mal hunting over the past 40 years appears to be unprecedented in a record spanning at least the past 5000 years. The closest possible parallels to this sudden reduction in hunting intensity and corresponding population increase likely occurred after European diseases dramatically reduced aboriginal populations in the early contact era (ca. AD 1774–1811) and again in the mid-19th century, just prior to the beginning of the commercial fur seal industry (Boyd 1999).

While it is striking to note the ongoing demographic consequences of historic-era commercial hunting, equally important are possible behavioral and ecological changes that occurred among targeted taxa over the Holocene. For instance, our compiled archaeological results indicate that aboriginal peoples regularly hunted northern fur seals for a minimum of 5000 years on the exposed Pacific coasts of Vancouver Island and northwestern Washington. These observations correspond with the locations of northern fur seal hunting mentioned in historic-era harvest logbooks (Olesiuk 2009a:42) indicating that the continental shelf off southwestern Vancouver Island has long been a major focus of fur seal foraging activity. However, many of these same historic-era harvest records (ca. AD 1891–1911) also indicate a strongly seasonal presence of northern fur seals at this latitude (January–May; Olesiuk 2009a:54), which contrasts with zooarchaeological data including osteometric evidence for localized breeding (Crockford et al. 2002; Etnier 2002a; Gustafson 1968), and geochemical evidence for nonmigratory midlatitude foraging and prolonged pup weaning dating from the mid-Holocene (Newsome et al. 2007). Tantalizingly suggestive historic accounts compiled from interviews with commercial fur sealers conducted a decade prior to the historic log-book-based records mentioned above, describe nonmigratory behavior involving giving birth at sea in kelp beds and observing fur seals in the Strait of Georgia during late summer when the migratory populations are in the Bering Sea (Crockford et al. 2002 citing Swan 1883). These data suggest historic-era commercial harvests may have eliminated or altered a behaviorally unique subpopulation of fur seals. Archaeological data yield important insight into the previously more diverse ecology of this currently strictly pelagic pinniped.

Although the absolute number of animals harvested cannot be quantified with our zooarchaeological data alone, our analysis has several implications concerning potential human impacts on pinniped and sea otter populations. First, our data indicate a regional focus on specific pinniped species, which implies that aboriginal peoples in these regions targeted specific taxa with regularity (e.g., annually or seasonally) as suggested by ethnographic accounts (e.g., Arima 1988; Suttles 1987a). Second, our data represent only a small percentage of the approximately 4000 currently documented coastal shell-midden sites present in the study area (British Columbia Archaeology Branch n.d.). Thus, the collective impact of aboriginal hunting may be considerably greater than previously recognized if these regional patterns apply to these several thousand unexamined sites. Finally, the temporal and spatial consistency of hunted marine mammals in these two regions indicates a degree of stability and continuity to aboriginal resource harvesting practices, which demonstrates the capacity for sustained harvesting in antiquity (cf. Etnier 2007).

Repetitive and consistent human participation in an ecosystem provides structure to ecological interactions (Balee 2006; Hobbs and Fowler 2008; Liu et al. 2007). However, determining and/or identifying “human impacts” in such an archaeological context is challenging as these ecosystems may represent the endpoint of centuries or millennia of human hunting. Future analyses that can incorporate more fine-grained osteometric information on age and sex distribution will likely yield greater insight into these ecological impacts.

Considering the ecological dimensions of human subsistence activity in coastal environments, Fedje et al. (2004) offer a distinction
that seems to encompass the regional differences we observe in our analysis of mammalian hunting practices; the concept of “maritime” and “coastal adaptations.” These authors define a “maritime adaptation” as one that is:

heavily reliant upon marine and coastal resources for the majority of subsistence needs. In contrast, a “coastal adaptation” involves the fluent use of coastal and marine resources for at least some, and probably a significant portion, of the subsistence needs of a group of people. Coastal adaptations should therefore include the possibility of considerable use of terrestrial resources and inland areas. (Fedje et al. 2004:112)

This synthetic statement helps characterize the regional differences observed in our analysis, suggesting that aboriginal peoples in the Salish Sea adopted and practiced terrestrial mammal hunting much more extensively than aboriginal peoples on western Vancouver Island. This observation is consistent with ethnographic and archaeological information from Coast Salish peoples in the Salish Sea region, where widespread aboriginal burning practices aimed to enhance and expand habitat for economically important plants such as camas (Camassia quamash) and berries as well as to entice foraging ungulates into recently burned areas with young regrowth (Brown and Hebda 2002; Suttles 1987b; Weiser and Lepofsky 2009). Conversely, on western Vancouver Island, the logistics of hunting pinnipeds in a pelagic environment likely facilitated other forms of offshore subsistence activities (e.g., deep-water fishing and birding) as well as voyaging and trading (Arima 1988; McMillan 1999).

However, while the concept of “adaptation” (defined as “the suiting of one thing to another”) may help characterize human hunting activity expressed over thousands of years, a term that is more appropriately scaled to human lifetimes is “tradition” (defined as “the act of handing down”). Considering long-term hunting practices as “traditions” accommodates the intergenerational transference of complex hunting knowledge in a way that anthropological uses of “adaptation” often underspecify or ignore altogether (cf. Moss 2008).

The regionally consistent patterns of terrestrial and marine mammal use were additionally constrained or enabled by environmental differences between the two regions: for instance, the open prairie oak savanna woodlands of the Salish Sea versus the very moist dense coastal rainforest on western Vancouver Island (Suttles 1987b), or the higher primary productivity on the exposed Pacific coast versus the Salish Sea (Ware and Thompson 2005). However, while it is essential to consider the environmental factors that may contribute to how aboriginal peoples may have focused on marine or terrestrial mammals, these factors alone cannot adequately explain how or why generations of people choose to participate in an ecosystem in a particular manner. Rather, explanations that posit an environmental imperative for human action risk imposing an unnecessarily deterministic assumption. Thus, although the relative contribution of marine and terrestrial hunting was undoubtedly constrained to some degree by the presence or absence of particular animals, human hunting may also have facilitated and/or enhanced abundance of certain species. For instance, the ethnographically observed harvesting of starchy, carbohydrate-rich camas bulbs in the Coast Salish region may have nutritionally facilitated higher levels of ungulate hunting (which are rich in protein but are relatively low in fat). Likewise, the widespread association of camas harvesting with aboriginal burning likely increased ungulate forage (and presumably abundance) while also expanding patchy savanna habitat conducive to terrestrial hunting (Weiser and Lepofsky 2009). On the exposed Pacific Coast, however, the observed focus on pinniped hunting (foods that are rich in fat and oil) may have nutritionally compensated for a relative lack of dietary carbohydrates and enabled the elaboration of other forms of pelagic hunting practice while also expanding the capacity for trade and regional interaction. Rather than a simple consequence of “available resources,” these hunting practices reflect
socially and logistically elaborate traditions that likely have considerable ecological significance to contemporary ecosystem.

In contrast to an environmentally determined model of human subsistence, aboriginal peoples of the Northwest Coast are increasingly recognized as highly active in “managing” subsistence resources through explicit cultural definitions of harvesting practice and etiquette including selective harvesting, seasonal restrictions on use and/or consumption, and proprietorship over resources that was contingent on sustained productivity (Berkes and Turner 2006; Hunn et al. 2003; Weiser and Lepofsky 2009; Trosper 2009). The data presented here suggest that generations of people actively chose to pursue an elaborate, highly structured, and specialized activity—primarily pelagic marine mammal hunting or primarily terrestrial mammal hunting in different regions. These hunting traditions embody the skill, training, and cooperation, that develop over years and decades among groups of individual hunters and which are passed on to subsequent generations in a community of continuous social practice (cf. Bourdieu 1977). The consistency and continuity with which certain species were utilized in the archaeological assemblages over 5000 years suggests that similar cultural practices informed aboriginal peoples’ hunting behavior in the archaeologically documented past.

CONCLUSIONS

We posed three questions at the beginning of this chapter:

• What marine mammals did aboriginal people in southern British Columbia most commonly utilize?
• How similar or how different are species occurrences and proportions relative to today?
• Is there evidence of specialized or regional hunting traditions and if so, what might have been the potential impacts of these activities on the ancient marine ecosystem?

In answer to the first question, northern fur seals, harbor seals, and Steller sea lions respectively appear to be the most heavily utilized pinnipeds on the southern BC coast over the last 8,000 years. Sea otters appear to be utilized by peoples on western Vancouver Island and the Olympic Peninsula, and are present only in low numbers at several sites in the Salish Sea. The least utilized pinnipeds appear to be California sea lions, elephant seals, and Guadalupe fur seals, which are rare but are found in sites along the southwestern margin of the study area. These are relative differences however, and, considering these data represent small samples from much larger sites, even small relative percentages may in fact represent large numbers of harvested animals.

In regards to the second question, our data expand knowledge of the range and relative composition of marine mammal species that are currently threatened or endangered (Table 7.1). Examining the archaeologically known distribution of these species provides context for understanding their recovery since historical overexploitation and the extent to which aboriginal peoples may have influenced the marine ecosystem before the historic-era fur trade. Considering the fact that the 58 examined sites represent less than 1% of the approximately 4,000 currently documented coastal shell-midden sites present in the study area (BC Archaeology Branch n.d.), the perspective gained here hints at the potential cumulative influence of large indigenous human populations in the region. The extent and significance of this influence is unknown at this time, but did not appear to have resulted in a dramatical change their hunting patterns. Such basic insights help refine our understanding of the influence of human activity on the environment and, conversely, the influence of animals on human activity.

And finally, this study indicates that aboriginal people on the outer coast of Vancouver Island and Washington State developed a specialized hunting tradition targeting northern fur seals. This conclusion is further supported by several ethnographic and historic sources (e.g.,
While hunting practices documented in archaeological contexts represent only a small portion of the rich ancestral pasts of coastal First Nation communities, zooarchaeological data represent a readily available source of information that broadens our contemporary understanding of ancient coastal lifeways and cultural environments. Such ecologically significant marine data is essentially nonexistent outside of archaeological contexts, and future research will benefit from additional analyses of new sites, regions, and time periods as well as more detailed osteometric observations. The compilation of zooarchaeological information explored in this paper suggests coherent patterns indicating the persistence of hunting traditions practiced continuously over 5000 years. These patterns help unravel the complex interwoven cultural and ecological histories on the Northwest Coast.

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