AN ABSTRACT OF THE THESIS OF

Lee W. Lindsay, Jr for the degree of Master of Arts in Interdisciplinary Studies in the co-departments of Anthropology, General Science, and Geography presented on May 31, 1990.

Title: Development of a Bone Artifact Typology for the Oregon Coast.

Abstract approved: Redacted for Privacy

Richard E. Ross

This thesis was to develop a bone artifact typology for the Oregon coast. This typology was used to test the hypothesis that different geographical regions of the Oregon coast would have different artifact assemblages associated with them. These regions, iddentified by geologist from landform changes, have been defined as: region 1, from the Columbia River to Tillamook Head; region 2, from Tillamook Head to Heceta Head; region 3, from Heceta Head to Cape Arago; region 4, from Cape Arago to the California boarder.

Three criteria were used to develop the bone artifact typology; (1) the artifact must be made from bone, antler, or tooth; (2) the use of the artifact as determined from previous experimental archaeology or ethnography; (3) where artifacts were used for a similar purpose, obvious differences in shape and/or decoration were used. Fifteen sites on the Oregon coast, two to four sites from each region, were used to develop the typology and test the hypothesis.

Some patterns were apparent in the distribution of the artifact assemblages from the Oregon coast sites and there appeared to be some tentative corralation with the geographic regions as stated above. Bilaterally barbed harpoons only appear in sites in region 1. Headscratchers only appear in sites in the southern half of the Oregon coast. Evidence suggested that the composite toggling harpoon was developed in the northern northwest coast and was introduced 3000 or more years ago in region 1, and spread slowly down the Oregon coast until it reached region 3 and 4 only 500 years ago.

Development of a Bone Artifact Typology for the Oregon Coast

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Chapter 1

INTRODUCTION

Most of the archaeological research on the Oregon coast has been limited to basic information gathering. It has only been during the last decade that investigators of Oregon coastal archaeology have turned to model building and typological research. Historically, the early periods of research tend more towards information gathering, but now enough information has been gathered to attempt some basic theory building.

Three basic research questions for the Oregon coast have been proposed (Lyman and Ross, 1988). These questions are: how do Oregon coast cultures compare to the "classic" Northwest coast cultures of British Columbia?; what are the geographic and temporal origins of native Oregon coast peoples and their cultural adaptations?; and, finally, what adaptive variations are evidenced across geographic and environmental space and what changes in adaptations occur through time? Standard typologies for the Oregon coast will help to answer these questions.

Typologies are basic tools for cultural research (Ford, 1954) and are used to trace cultural change. Typologies can be used to trace cultural change through time by noting changes in artifact types in temporal assemblages. They can also be used to trace geographical cultural changes by noting the spread or contraction of an artifact type.

A lithic typology was developed for the southern Oregon coast by examining "arrow head" collections of artifact collectors (Pullen, 1982). Two new lithic types have been introduced (Draper, 1980), but no other lithic typologies for the Oregon coast exist. Additionally, no bone artifact typologies for Oregon coast

sites exist. This thesis proposes a typology for some bone artifacts found on the Oregon coast.

Philip Drucker (1943) had developed a typology for bone artifacts along the northern British Columbia coast, particularly for the Tsimshian and Kwakiutl and some Salishan native groups. These typologies are for harpoon points, composite harpoons, fixed bone or horn projectile points, flaking tools, wedges, bone mallets, small slender pointed bone objects, drinking tubes and whistles, bone clubs, spindle whorls, and ornaments. Drucker also had typologies for some stone artifacts. In a study of the Minard site in Washington, Roll (1974) developed a typology for bone and lithic tools. Kenneth Ames (1976) also did a typology study of bone tools for Prince Rupert Harbor, British Columbia. Several of the types from the sources listed above are applicable to the Oregon coast.

The basic types presented in this thesis were developed by reviewing the literature on existing typologies for the Pacific Northwest Coast, which were examined to see if modification was needed for application to the Oregon coast. New types were formed by physically examining several artifacts from Oregon coastal sites and subsequently placing them into separate morphological types.

One major problem to consider is the fragmentary nature of many of the artifacts. Not all artifacts are whole and some dimensions will need to be reconstructed. The dimensions used in the typology will be the dimensions that have survived or been reconstructed, which may not be the original dimensions. A related problem is determining dimensions from site reports. Often complete artifact dimensions are not recorded in a report. Some variables are taken from photos, or are simply not available.

The overall climate on the Oregon coast is homogeneous; the landforms of the Oregon coast vary from sand dunes to basaltic headlands. These various

landforms give the Oregon coast a wide variety of microclimates and of resources that the native people were able to use. The hypothesis presented in this paper is that the different resources available in each landform region may be reflected in the bone artifacts produced on the Oregon coast. This hypothesis will be tested by examining the distribution of artifact types from sites along the Oregon coast.

Chapter 2 introduces the Oregon coast both geographically and ethnographically. Chapter 3 researches the concept of the type as used by archaeologists. This chapter discusses the typology concept and how a type is determined, as well as associated problems. Chapter 4 lists some of the bone artifact types found on the Oregon coast. Chapter 5 gives the sites used to develop this bone artifact typology and which artifacts were found at each site. Chapter 6 shows the utility of the typology by testing it against the landform regions, thereby testing the hypothesis that types will vary as the ecology varies along the Oregon coast. This chapter also lists some areas for future research.

Chapter 2

INTRODUCTION TO THE OREGON COAST AND ITS PREHISTORY

The Oregon coast is a narrow strip of land approximately 500 km long. The coastal area extends from the shoreline to the Coast Range. The extent of the coastal strip varies from a narrow strip with the Coast Range right at the shore line, to a distance of no more than 6 km inland (Cooper, 1958). The narrowness of the coastal plain is not the only unusual feature of the Oregon coast. There are 21 rivers along the Oregon coast which empty into the Pacific Ocean. Only two of the 21 rivers, the Umpqua and Rogue rivers, cut through the Coast Range to reach from the Cascade Range to the Pacific Ocean; the rest originate in the Coast Range. The Oregon Coast Range, which extends from the Columbia River to about the latitude of Cape Blanco, is made of sedimentary and volcanic rocks from the Tertiary, with a structure that is a low broad anticline (Cooper, 1958). South of Cape Blanco to the California boundary, merging with the Coast Range, are the older, more geologically complex, Klamath mountains. Because the Coast Range has only two rivers which cut through it, the native groups that lived on the Oregon coast tended to be somewhat isolated from the rest of the Oregon peoples (Cressman, 1953).

The climate on the coast is mild. The Köppen classification is Csb (Cooper, 1958) [C=mesothermal, s= summer dry, b= warmest month below 23 C (Gregor, 1963)]. Mean temperatures range from 5 C to 16 C. Precipitation is heavy in the winter with a summer deficiency in July and August. There is occasional snowfall, but the amount is not significant and quickly vanishes. Annual precipitation ranges from 152 cm to 238 cm. The wind is mostly from the NNW direction in the summer. The average summer wind velocity is greater than at any other time (Cooper, 1958). Fall winds are transitional, shifting from NNW to SSW. Winter

winds are SSW and tend to have a low average velocity. Spring winds are again transitional.

Vegetation on the Oregon Coast

The overall climate on the Oregon coast is homogeneous but the various landforms, which will be discussed next, provide the Oregon coast with many different habitats for harboring a wide range of different plant communities. These plant communities create many different environments for a wide range of animals. Different plant communities supply many different resources such as seaside lupine (*Lupinus littoralis*) in the dry meadows, the coast strawberry (*Fragaria chiloensis*) in the meadows, salal (*Gaultheria shallon*) in the low shrub areas, and skunk cabbage (*Lysichitum americanum*) in the fresh water wetlands. Each of the above plants were important food and medicinal resources for the native people on the Oregon coast (see pages 25-28).

The overall vegetation on the coast is defined as the "Pacific Coastal Forest Complex" (Cooper, 1957) which occupies the area from central California to Alaska. The principal trees are the Western hemlock [*Tsuga heterophylla* (Raf.) Sarg], Red cedar (*Thuja plicata* Donn.), and Douglas fir [*Pseudotsuga menziesii* (Mirb.) Franco]. An important tree in the region from the California border to just north of Coos Bay is the Port Orford cedar [*Chamaecyparis lawsoniana* (Murr.) Parl.]. In the immediate vicinity of the ocean there is Sitka spruce [*Picea sitchensis* (Bong.) Carr.] and lodgepole pine (*Pinus contorta* Dougl.). Both are resistant to windborne sand, salt spray, and the desiccating winds (Cooper, 1958). The vegetation on the sand dunes is confined mainly to the deflation plains. The community types were defined as the dry meadow, meadow, rush-meadow, marsh, low or tall shrub, and forest communities (Weidemann, 1966).

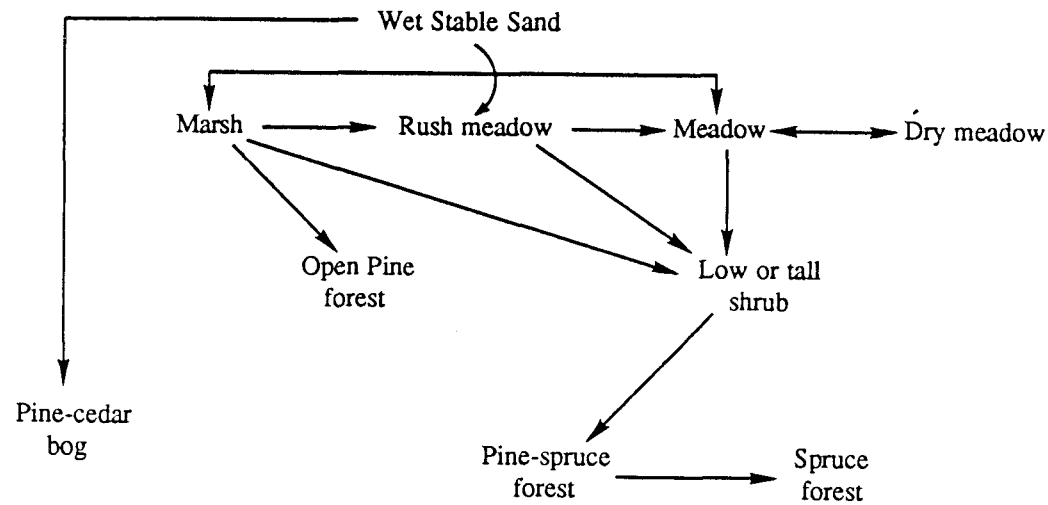

Figure 1. Successional pathways for vegetation on sand dune deflation plains (after Weidemann, 1966).

The dry meadow community is a transitory community which slows the sand movement for a time. The dry meadow community rarely leads to succession. The dominant species are seaside lupine, beach grass (*Ammophila arenaria*) and blue grass (*Poa macrantha*). This is an open community with vegetation cover between 25-50%.

Succession tends to occur on the wet stable deflation plains (see Figure 1). The meadow community has a vegetation cover of 83%. The dominant species are the grasses red fescue (*Festuca rubra*) and early hair-grass (*Aira praecox*). False dandelion (*Hypochoeris radicata*) and coast strawberry are also present and seedling *Pinus contorta* are numerous in the meadow community.

The rush-meadow community has a vegetation cover of 92% (Weidemann, 1966). The dominant species are a clover (*Trifolium willdenorii*) and a rush (*Juncus phacocephalus*). Common wild aster (*Aster subspicatus*) and golden-eyed grass (*Sisyrichium californicum*) are also present in the rush meadow community.

The marsh community grows in areas that are moist most of the year. The vegetation cover is about 95% and the dominant species is a sedge (*Carex obnupta*). Succession from this community can result in an open pine forest or a low or tall shrub community.

The low shrub community contains shrubs and trees up to 1.2 meters tall. The dominant shrubs are a member of the willow family (*Salix hookeriana*) and salal with *Pinus contorta* seedlings. The tall shrub community is, of course, taller, from 1.2 meters up to 3.0 meters, and the vegetation is thicker. *Salix hookeriana,* and wax myrtle (*Myrica californica*) are dominant with some salal. *Pinus contorta* is taller and *Picea sitchensis* is present.

The forest communities all contain *Pinus contorta* with a variable number of other tree species, depending on the available moisture. *Picea sitchensis* develops with *P. contorta* or shortly after, apparently needing protection from the salt winds (Wiedemann, 1966).

A study of transition zone vegetation on the Oregon coast (Frenkel et al., 1978) gives descriptions of salt marsh, freshwater wetland, and upland vegetation on the Oregon coast. Salt marsh vegetation includes *Cordylanthus maritimus* (saltmarsh bird's-beak), *Cuscuta salina* (saltmarsh dodder), *Orthocarpus castillejoides* (paintbrush owl-clover), *Spergularia canadensis* (canadian sandspurry), and *Zostera marina* (eelgrass) as well as several other plants that grow in most of the communities.

Freshwater wetland plant communities include; skunk cabbage, *Typha latifolia* (cattail), as well as other plants. Upland vegetation communities include: *Abies grandis* (grand fir), *Arbutus menziesii* (Pacific madrona), *Arctostaphylos uva-ursi* (kinnikinnic), *Berberis aquifolium* and *B. nervosa* (Oregon grape), *Fragaria chiloensis* (coastal strawberry), and other plants (Frenkel et al, 1978).

Each plant community has different resources for the native people to take advantage of. The different vegetation communities which result from the different landform on the Oregon coast show the importance of understanding the physical landforms found on the Oregon coast.

Physical Landform of the Oregon Coast

The Oregon coast can be divided geographically into four regions (Cooper, 1958). Region 1 extends from the Columbia River to Tillamook Head (see Figure 2). Region 2 is from Tillamook Head to Heceta Head. From Heceta Head to Cape Arago is Region 3, and Region 4 extends from Cape Arago to the California border.

Region 1 is the Clatsop Plains area. This area is primarily covered with dunes. These dunes form regular ridges parallel to the shore (Cooper, 1958). The Clatsop Plains area is a region of sand deposition; filling began some time after the post-glaciation sea level maximum (Lund 1972a).

The landforms of Region 2 mainly are broken cliffs. This is an area of sedimentary and basalt headlands broken by marine terraces (Lund, 1971, 1972a, 1972b, 1974). Few sand dunes exist in this area, and are usually isolated in capes and headlands (Weidemann, 1966).

The area between Heceta Head and Cape Arago (Region 3) is called the Coos Bay Dune Sheet (Cooper, 1958). This large dune area is divided into three sections by the Siuslaw and Umpqua Rivers (Lund, 1973). The region appears to be composed of a sandstone sedimentary rock, of the Eocene Tyee Formation, that was eroded by high sea levels in the Pleistocene. This erosion formed a level, wave-cut terrace perfect for sand dune formation.

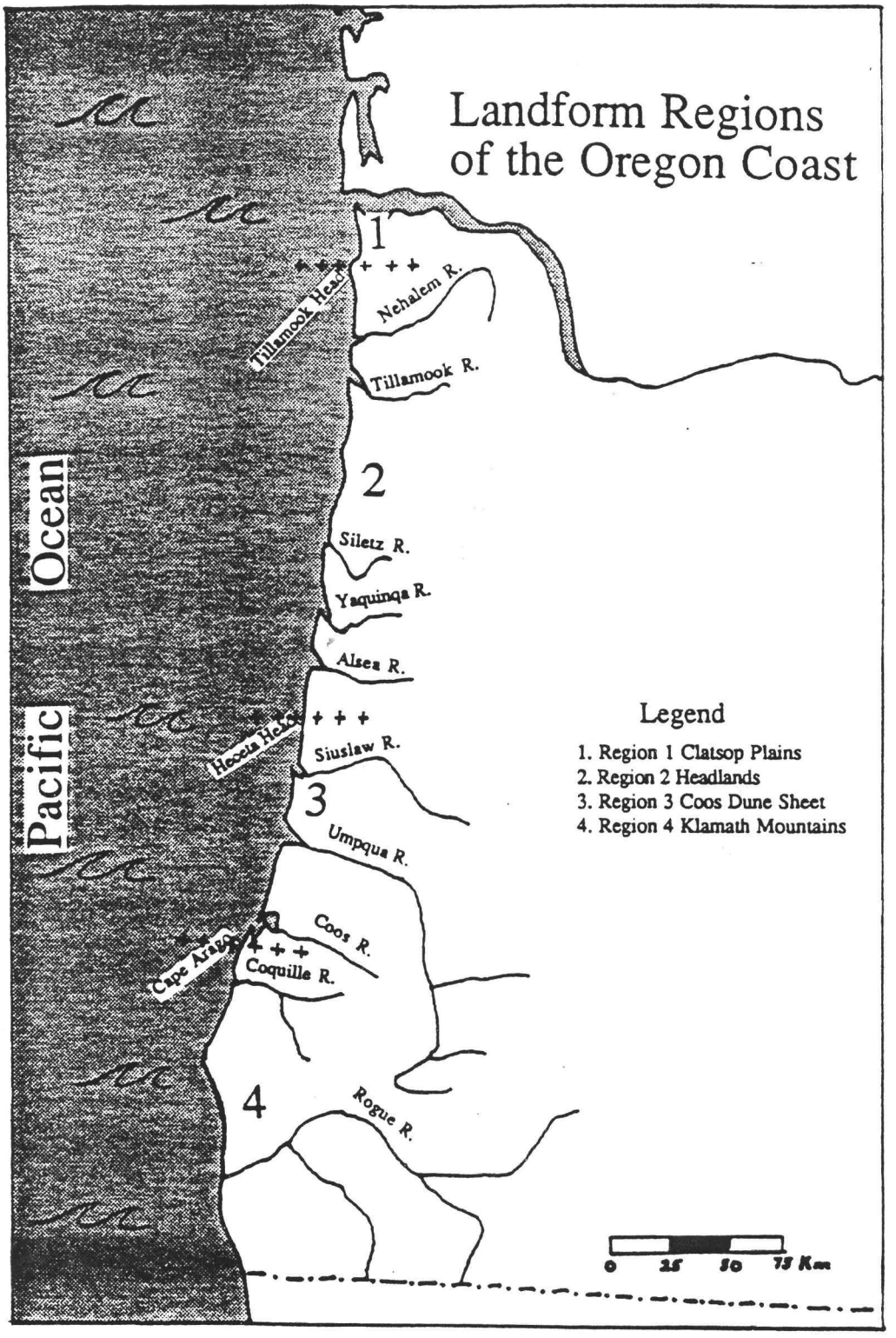

Figure 2. Coastal regions on the Oregon coast.

The dune area can be divided into nine landscape units: the swash zone, foredunes, stable secondary dunes, deflation plain, wet interdune, dune complex, open sand, older stabilized dunes, and flat coastal land (Starr et al., 1976). The swash zone is the area periodically covered and uncovered by the tides or waves. There is no established vegetation in the swash zone. The foredune, a dune just inland of the swash zone, provides a ridge of sand acting as a barrier to the ocean waves. The primary vegetation is beach grass. The conditionally stable secondary dunes are those dunes that have stopped migrating because of European beachgrass (*Ammophila arenaria*) establishment (Starr et al., 1976). These could easily become active again through blowouts. The deflation plains are large open areas which are wet in winter and dry in summer. These areas are capable of supporting vegetation as noted earlier (see page 5-8). The wet interdune areas are covered by water most of the year. These are usually fed by streams and support rushes, sedges, willows, and other vegetation. The dune complex is composed of small stable secondary dunes, deflation plains and wet interdune areas (Starr et al., 1976) which are too small to be considered as individual units. Dune complexes are no more than 360 meters wide. The open sand area is a large area of open active sand dunes. The older stabilized dunes have been covered by vegetation and support Sitka spruce and pine forests. The flat coastal land is a large, flat area of little relief, usually covered by forest.

Region 4 is the Klamath mountains area. The oldest rocks in western Oregon are found in the Klamath Mountains. This area is dated from the Paleozoic to Triassic eras (Baldwin, 1976). The Klamath's are 2,000 to 5,000 feet in relief with Mt. Ashland the highest peak at 7,530 feet. The mountains break near the coast, with a narrow coastal plain between the mountains and the ocean. The

plain is made up of marine terraces along the coast which were formed approximately 35,000 years ago (Baldwin, 1976).

Ethnographic and Archaeological Background

Ethnographic studies of Oregon coast natives began in the late 1800's. A large amount of information was lost when European epidemics swept through the native populations in Oregon and, later, when native people were relocated to reservations. Owen Dorsey (1889:55) expressed surprise "to find no Indians in their native attire." Ethnographic studies were begun when it was realized that there were only a few, often only one or two, who could remember the old ways. Studies of native Oregon cultures were often based on the remembrances of people who were young children in the pre-reservation days. Many traditions were no longer practiced during the reservation period, and customs from other groups who shared the reservation were frequently adopted (Viles, 1988). The studies of Franz Boas (1898), J. Owen Dorsey (1889, 1890), Philip Drucker (1940, 1943), Melville Jacobs (1939, 1940), and others preserved a small part of the cultural heritage of the Oregon coast native people.

Two of the earliest archaeological investigations on the Oregon coast were those of H.A. Chase in 1873 (Draper, 1981) and Paul Schumaker in 1873 and 1875 (Draper, 1981; Schumaker, 1874). These two investigated and collected artifacts from native settlements and excavated native burial sites.

No further archaeological work was done in Oregon until the 1930's when Kenneth Leatherman and Alex Krieger excavated three house pits, estimated to be from the mid 19th century, at Bullards beach (Leatherman and Krieger, 1940). Joel Berreman also excavated a site at Lone Ranch creek in 1936 and 1937 (Berreman 1944). Another survey was done in 1951 and 1952 by Lloyd Collins, which

covered the area between Astoria and Cape Blanco and recorded 133 prehistoric sites (Draper, 1988). In the 1950's Luther Cressman excavated a site (35CS5) on the Bandon sand spit and site (35CS23) just south of Coquille (Cressman, 1953). Neither site is older than 400 B.P. (Draper, 1981).

Thomas Newman (1959) excavated a site at Netart's sand spit (35TI1) dated from 1400 AD to 1800 AD. George Phebus excavated three sites at Seaside: 35CT47, 35CT13, 35CT20. The first site, 35CT47 was dated at 600 BC, while the other two were dated between 300-900 AD.

Further archaeological excavations were done on the Oregon coast by Oregon State University (see Bennett, 1989; Barner, 1982; Clark, 1989; Draper, 1980; Ross, 1975, 1976; Snyder and Ross, 1980; Snyder, 1978; Zontek, 1983) and a survey done by Dr. Richard Ross in 1975 (Ross, 1983). Dr. Roberta Hall of Oregon State University became involved with the Coquille tribe in excavating the Bandon site (35CS43)(Hall, 1986; Hall et al., 1990; Lindsay and Keith, 1986; Lindsay et al., 1989; Mace, 1986; Ross, 1986; Vogel and Hall, 1986). Other sites excavated on the Oregon coast include Port Orford (35CU9) excavated by Dr. Ross (1977), the Three Rox site (35LNC33) at the mouth of the Salmon River (Murray, 1983), Tahkenitch Landing (35DO130) excavated by Heritage Research Associates (Minor and Toepel, 1986), and Yaquina Head (35LNC62) also excavated by Heritage Research Associates (Minor et al., 1987). This information has provided enough data that hypotheses concerning the origins and cultural development of the prehistoric people of the Oregon coast could be produced.

Origins and Cultural Models

Three areas of coastal cultural adaptations, maritime, littoral, and riverine-/interior, have been defined (Lyman and Ross, 1988). Each area supports different methods of resource gathering and usage.

A maritime culture is focused on the open sea. It is a culture with the tools, technology, and knowledge to exploit sea resources. Maritime people regularly hunt the open sea and are equipped with seagoing canoes.

A littoral culture depends heavily on the sea, but does not "... use the open sea as a hunting and fishing area" (Lyman and Ross, 1988). These are groups of people who do not actively go into the open sea to hunt. Littoral people may have the ability to actively hunt the open sea, but have enough resources easier to exploit without the dangerous task of hunting the open sea. Littoral people primarily utilize shore/near shore resources.

The third defined cultural category is that of riverine/interior culture. These are people who exploit estuaries, the land from the rivers' mouth to the end of the tidewater (Lyman and Ross, 1988). Deer (*Odocoileus* sp.), elk (*Cervus elaphus*), and other land mammals, river mussels, salmon (Family Salmonidae), and other fish are regularly exploited, but open sea resources are not actively exploited.

Prehistoric people of the Oregon coast exploited the shore and near-shore resources, with some land resources such as deer, elk, and small land mammals as dietary supplements. This pattern places Oregon coastal people, from 6000 B.P. to the time of the reservations, in the littoral culture classification.

Several ideas have been proposed on how and when the first inhabitants adapted to the Oregon coast environment. If the prehistoric people came from inland areas, following the ice-free corridor hypothesis, they would have had to learn to adapt to a coastal lifestyle. Conversely, if they came along the coast from

Alaska, then most likely they were already adapted to using sea resources. Coastal prehistory begins with sites radiocarbon dated about 9000 years B.P. for the Northwest coast of British Columbia (Fladmark, 1979) and 8300 B.P. for the Oregon coast (Lyman and Ross, 1988).

Models of how people adapted to the Oregon coast tend to be broad and sweeping. As more information is gathered these models, which are based on limited data, are refined and updated (Snyder, 1988). One such model was developed by R. Lee Lyman and Richard Ross (1988) and is used here (see Table 1.). The earliest reported occupation on the Oregon coast is at the Neptune site on the central coast dated at around 8300 B.P. Prehistoric people of that era exploited a broad range of resources, but emphasized terrestrial and fresh water resources and were considered to be a riverine/interior culture. This is the pre-littoral stage.

Table 1. Lyman and Ross's model of coastal adaptation (Lindsay, 1989).

Time period	Cultural stage	Adaptation
8300 to 6000 B.P.	Pre-littoral	Riverine/Interior
6000 to 2000 B.P.	Early littoral	Littoral
2000 to 100 B.P.	Late littoral	Littoral

Pre-littoral subsistence patterns gradually evolved into a strategy focused on coastal resources. Exploitation of sea mammals, shellfish, marine and anadromous fish increased about 5000 to 6000 years ago. This marks the change to the early littoral stage which lasted until approximately 2000 B.P.

The late littoral stage on the Oregon coast was not a dramatic change from the early littoral. This stage was marked by a more sedentary lifestyle, with permanent settlements caused, perhaps, by an increase in population. People were more deliberate in their choice of resources, carefully planning resource gathering strategies rather than going out and getting whatever happened to come by. This

stage continued until about 150 to 300 years ago when diseases, which caused high mortality among the natives, forced many cultural changes to occur among the native people.

Most archaeologists believe that prehistoric coastal people during each of these stages followed a yearly cycle. The most familiar seasonal pattern is that of the late littoral. The models used for each of the littoral stages during the last 6000 years is based on this pattern of seasonal rounds.

The seasonal round started with winter villages adjacent to the estuaries (Lyman and Ross, 1988). Winter was a period with time for leisure and a time for stories (Beckham, 1977) which passed on the traditions and culture of the people and perhaps some opportunistic resource gathering. Spring was a time to disperse and gather plants and mussels, and for some fishing (Harrington, unpublished notes). Late summer was the time when people moved to fishing camps for the returning salmon. The salmon were dried for winter storage. Fall was the time to return to winter villages (Aikens, 1984).

> During the salmon season they lived up the river. All people lived (then) up-stream, catching salmon. Many women cut (open the) salmon. Thus they used to obtain food. They used to dry salmon right there where they lived, up-stream. When the salmon was gone (ready), then they went (back) to the mouth of the river. Some of their people hunted habitually, having gone far up the river. They killed elk, and dried their (killed game). Whoever knew how to hunt did it thus. When their food (accumulated) greatly, they went back. Thus many did. Then they assembled at the mouth of the river. Many people lived there. In the winter, whale (sometimes) came ashore. Thus people living long ago did."
> (Frachtenberg,1914:83)

Fishing

Fish was the main resource for the coast. Many native groups ranked salmon (Family Salmonidae) as the number one fish resource in their diet (Drucker,

1943). After being smoked-dried, salmon could be stored for a considerable time even in Oregon's humid coastal climate. The short procurement and preparation time needed to gather and store large amounts of fish allowed time for activities such as making baskets, having ceremonies, and playing games such as shinny.

There were no doubt hard times for the people on the Oregon coast, such as when the salmon runs would be small or nonexistent, when food would be short because of natural conditions, failure to store adequate amounts, or because the people held too many feasts and used up their stored supplies (Suttles, 1968). Despite the hard times, people on the Oregon coast appeared to have a diverse enough resource base that they did not suffer the hardships of the inland groups.

The common element among coastal people was the first salmon ceremonies which welcomed the return of the salmon. Salmon were immortals who would leave their mortal bodies and return the next year. If the salmon were offended, they would not return to that particular river again, leaving the people to starve. Therefore, salmon must be treated well, insuring that they would return the following year (Drucker, 1965).

Coastal people usually used a fish dam or weir, often with a basketry fish trap. Fish weirs operated on a simple principle (Figure 3). Weirs would permit water to flow normally but diverted the fish into a restricted area so they were trapped. The trap was usually made of willow or fir (Barnett, 1937). Fish weirs were generally made by placing poles across the river braced against posts which had been pounded into the river bottom. Southern coast people made use of hemlock brush tied together braced against upright poles to make their fish weirs (Harrington, unpublished notes). Some natives built high wooden platforms from which they scooped the fish out of the river with dip nets or speared them with harpoons (Drucker, 1943:82; Harrington, unpublished notes; Underhill, 1945:18-20).

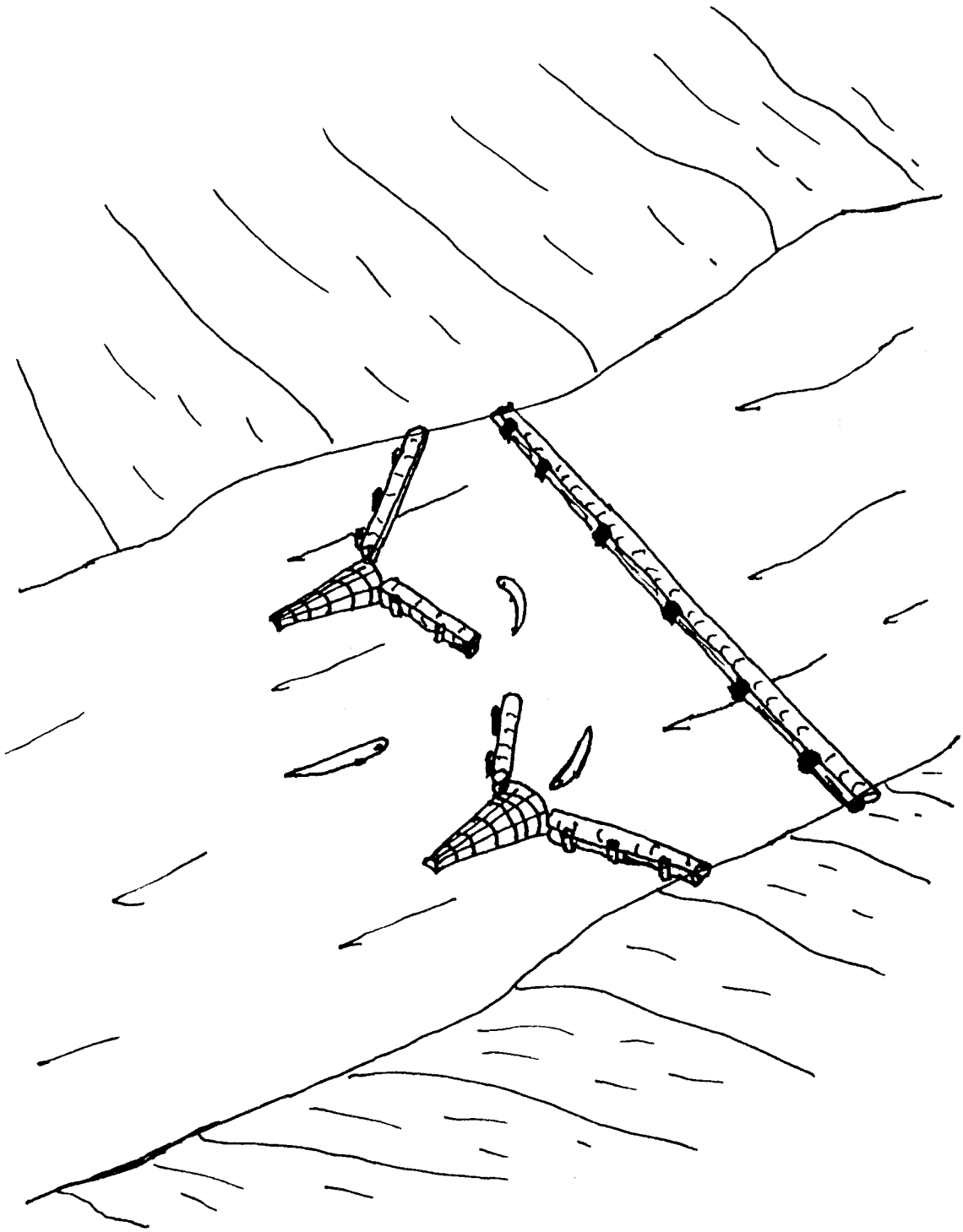

Figure 3. Fish weir used on the Oregon coast.

Dip nets made of vine maple (*Acer circinatum*)(Drucker, 1943; Harrington, unpublished notes), were used to dip the fish out of the water and onto the land where the fish would be clubbed. Whale bone clubs have been found in sites such as Port Orford (Ross, 1977).

Harpoon shafts were typically made of fir or spruce and used with a barbed bone or horn point (Drucker, 1943). Composite toggle-headed harpoons were used among the coast people (Barnett, 1937). The composite toggle-headed harpoon was made of two curved plates of bone, carved to fit around a bone or stone point. A cord wrapping sealed with pitch held the point together. Single component barbed harpoon heads were carved from bone or wood. The harpoon head fit onto the shaft, with a cord tied to the head forming a line to keep hold of the prey.

The coast had a plentiful supply of fish such as salmon, seaperch and surfperch (Family Embiotocidae), flounder and sole (Family Pleuronectidae), sculpin (Family Cottidae), greenling (Family Hexagrammidae), rockfish (*Sebastes* sp.), and pacific herring (*Clupea pallasii*). Coos people used herring, which could be eaten bones and all (Harrington, unpublished notes). Hook and line were used to take fish such as tom-cod (*Microgadus proximus*), ling cod (*Ophiodon elongatus*), rat-fish (*Hydrolagus colliei*) and several other species (Harrington, unpublished notes). Hooks were made of bone or from yew wood (*Taxus brevifolia*) which would be steamed and bent into a U-shape and the side fitted with a shank (Gunther, 1972; Stewart, 1973). These were placed on a line, perhaps weighted down, and placed on a pole or trolled from a canoe (Underhill, 1945).

Nets, made of grass or other plant fibers, were also used to catch fish (Harrington, unpublished notes). Dip nets were used to catch smelt or herring

(Underhill, 1945) and Frank Drew (Harrington, unpublished notes) remembered seeing his father out in the surf at Smelt-Cove dipping for smelt.

Once caught, fish needed to be stored. The most common method was to dry the fish on a rack and smoked them (Drucker, 1943; Hall, 1984; Harrington, unpublished notes; Underhill, 1945). Coquille people would smoke salmon using alder (*Alnus* sp.) or vine maple for the fire (Hall, 1984). Dried fish and other dried meat was often made into bales, which could weigh up to 100 pounds, for storage (Hall, 1984; Harrington, unpublished notes). The bales or baskets were then taken home and hung from the ceiling of the house where the smoke from the fire would help preserve the fish (Drucker, 1943:85).

Salmon eggs were eaten by many people on the coast (Barnett, 1937). The traditional method appears to have been to boil salmon eggs, but in historic times they were fried (Ward, 1986). The Alsea dried salmon eggs on a tray. Others ate raw salmon eggs with acorns to help reduce some of the acorn bitterness (Drucker, 1943).

Eels were caught in the late spring when they came into the estuaries. Eels were caught at a falls upriver on the Millicona or at Laverne Park on the Coquille River. They would be "hooked" off of rocks as they tried to get over the falls (Wasson, 1988). Jedediah Smith's party, near the mouth of the Smith River, traded 15 or 20 beaver skins from the native people and some elk meat and some lamprey eels (Maloney, 1940). A note: informants only refer to eels. Lamprey and hagfish are of the class Marsipobranchii and eels are of the class Pisces (Cushman, 1967). It is assumed most refer to lamprey but this is not certain. Language changes and generic references may mean that the true identity, lamprey or eel, has been lost.

Eels were caught with gaff hooks, in large basket traps, or in eel pots, and when the people were ready to smoke or dry the eels they would lift the pots out (Barnett, 1937; Beckham, 1977). It was believed by the Alsea that the meat would spoil if the eels were allowed to wriggle about until they died, so to prevent this, the fisherman would place an eel's head in his mouth and break its neck (Drucker, 1943). Coos people believed if you cut eel with anything but a freshwater mussel shell the meat would be poisonous and the eels would not come up river anymore (Harrington, unpublished notes).

Shellfish was an important resource on the coast. Forty-seven different species of shellfish were listed in Debra Barner's study of shellfish utilization on the central Oregon coast (Barner, 1982). People on the coast had favorite areas for gathering shellfish.

Shellfish were gathered in several ways, for example by prying mussels off of rocks with digging sticks. Clams were also dug up with digging sticks. Baskets were used to carry the shellfish (Drucker, 1943). Crabs (*Cancer* sp.) were gathered by poking them with sharp sticks (Barnett, 1937; Drucker, 1943). Men and boys would dive for horseneck clams (sp. unknown) at the bottom of deep channels (Harrington, unpublished notes).

According to one of Harrington's informants, barnacles (*Balanus* sp. or *Mitella polymerus*) could "... get as big as your fist and would taste like abalone and you just poke the meat out, and don't eat the shell" (Harrington, unpublished notes). Barnacles were reported to have been cooked in ashes (Barnett, 1937) or cooked *in situ* rather than going to the trouble of pulling them off the rocks. A fire was built on the rocks where the barnacles were, and when done, the meat was poked out and eaten (Barner, 1982).

Shellfish would be cooked with sea weed. A layer of sea weed would be laid over the hot coals and then the shellfish would be laid down to be covered with another layer of sea weed. This would steam the shellfish (Ward, 1986). To preserve mussels, they were smoked a little first and then dried (Harrington, unpublished notes). Foods were dipped in oil in pre-contact time (Suttles, 1968; Viles, 1988) later frying was introduced by Europeans (Hall, 1988).

The shells were also used. The shells of mussels or razor-clams were used as knives (Drucker, 1943; Harrington, unpublished notes; Steward, 1973). Mussel shells were used as scraping tools in basketry and in leather making (Hall, 1984; Viles, 1988). Spoons and beads could be made from shell (Steward, 1973). Shell was traded to inland people (Harrington, unpublished notes). Salt and shells would be traded for obsidian at Olalla on the east side of Camas Mountain (Ward, 1986). Two shells would buy an inland blanket (Harrington, unpublished notes).

Dentalia (*Dentalium pretiosum*) was an important wealth token along the coast (Barnett, 1937; Drucker, 1943) Dentalia were strung together in a strand of ten shells (Barnett, 1937). In the 1940's a string of dentalia was worth about 100 dollars, about what "... was paid for a wife" (Harrington, unpublished notes). Dentalia were traded from the north around Vancouver Island (Zucker et al., 1987). A fierce tribe of people were believed to have control of the only source of this fabulous wealth.

Olivella (*Olivella biplicata*) was a form of money and a valued ornament. Shell dresses and necklaces made of Olivella were, and are, used in puberty rites (Viles, 1988). Haliotis, or red abalone (*Haliotis rufescens*), were used as a wealth item also (Barnett, 1937). Abalone shells may have washed in to be found on the beaches around Coos Bay, or were traded in from southern areas. Clamshell disks were valued and were strung together and measured by the arm length (Barnett,

1937). Other than shell, the red-headed woodpecker scalp was one of the few valued wealth tokens (Barnett, 1937; Drucker, 1943, 1965; Hall, 1984)

Mammal and Bird Hunting

Mammal and bird hunting among the native people of the Oregon coast supplied people with a change in food, with hides, pelts, bone and antler for tools, and a way to show personal prowess (Drucker, 1965). One item of note was that the Coos, Umpqua, and Siuslaw rarely, if ever, ate bear (*Ursus americanus*) or raccoon (*Procyon lotor*). Many native people believed that these two animals acted too much like humans and that the bear was too closely related to humans to be eaten (Harrington, unpublished notes). Individuals who sought spirit powers that would come to them in animal form would not eat of these animals (Viles, 1988).

Seals and sea lions made up 54% of all mammal remains found at Bandon, Oregon in 1986 (Lindsay and Keith, 1986). One method of hunting seals and sea lions was to climb up on the rocks that they "hauled up" on and club them to death (Drucker, 1965:19). Steller sea lion (*Eumetopias jubata*) bulls can range between 252 to 321 cm (8.3 to 10.5 ft.) long and weigh up to 1000 kg (2200 lbs). The steller sea lion female ranges between 226 to 253 cm (7.4 to 8.3 ft) long and weighs up to 273 kg (600 lbs) (Schusterman, 1981). It would be very dangerous to be on the same rock with them. Sea lions were killed for oil and hide, which was thicker than horsehide. Lottie (Harrington, unpublished notes) remembers having sea lion jerky as a child around the turn of the century.

Fur seals (*Callorhinus ursinus*) were hunted, and it was hard work to skin them and make the skin soft and pliable (Harrington, unpublished notes). The paunch of a seal or sea lion would be blown full of air, which could be up to four

feet high. It would then be dried, and the paunch could be used to hold up to 20 gallons of seal oil (Harrington, unpublished notes).

Prehistoric people on the Oregon coast are not believed to have been active whale hunters, as were people farther up the coast. It is believed that Oregon people would wait until a whale was close to shore then drive the whale onto the beach (Ward, 1986) or wait until a whale stranded itself (Barnett, 1937; Frachtenberg, 1914). Whale was shared with all the people and was a time for celebration. Everyone received a portion of the whale and it was considered a great boon when a whale came ashore (Frachtenberg, 1914). Whale blubber was cured in slabs and dried. The slabs were hung in their houses until needed (Harrington, unpublished notes).

Native people of the Oregon coast hunted land mammals, as evidenced in the archaeological record by elk, deer, bear, and other animal remains. The minor emphasis on land mammal hunting was due not to a lack of knowledge in hunting methods, but to the reduced need to hunt on land when there was an abundance of sea resources at hand (Drucker, 1965). Hunting was practiced by some and items such as deerskin, deer hoof rattles, and sinew were important to people (Viles, 1988). The forest floor was kept burned down so that deer could be more easily seen (Harrington, unpublished notes).

Most groups on the Oregon coast used game pits to trap animals such as elk (Barnett, 1937). The pits were covered with brush and a log could be laid across the trail so the elk would jump over the log into the pit (Frachtenberg, 1914; Harrington, unpublished notes). Natives would club the elk or cut its throat. Jedediah Smith noted elk traps dug by the Chetco tribe on the coast after some of his men and horses fell into the pits (Maloney, 1940). The Alsea considered digging pits to be more work than was usually necessary and there was also the

possibility that a bear would tumble in and would claw down the sides of the pit until he got out, which ruined the pit (Drucker, 1943). This also opened the possibility of meeting the bear, which, considering the bear's likely mood, may not have been healthy.

Other mammals were used also. Rabbit (sp. unknown) was considered good eating, but no information is available on hunting methods. Beaver (*Castor canadensis*) tail was also considered good eating (Harrington, unpublished notes).

Very little is known about prehistoric use of birds by Oregon coast people. The red-headed woodpecker scalp was a highly valued object (Barnett, 1937; Hall, 1984; Jacobs, 1939) and being able to get either the pileated woodpecker or the yellow-bellied sapsucker was considered a valued skill. Geese were captured when they landed on a nearby hill during their migration (Ward, 1986). Sea gull eggs were considered a delicacy (Barnett, 1937; Ward, 1986). Shag eggs were used by several groups on the Oregon coast (Barnett, 1937).

Birds were caught by either shooting them or using a bird-snarling booth (Barnett, 1937). The booth was a basketry trap with a figure-4 release (Drucker, 1943). Children would use a slip noose to catch sea gulls (Drucker, 1943).

Bird bone has been found in archaeological sites along the coast (Greenspan and Wigen, 1987; Hall et al., 1990; Lindsay and Keith, 1986). Duck bones are common and, to a lesser extent, so are gulls and murre (Hall et al., 1990; Ross and Snyder, 1986). The Yaquina Head (35-LNC-62) (Minor et al., 1987) bird remains recovered include geese and ducks (*Anatidae*). Also recovered were albatross (*Diomedea sp.*), and cormorants (*Phalacrocorax sp.*), including the double-crested cormorant (*P. auritus*), Brant's cormorant (*P. penicicillatus*), and pelagic cormorant (*P. pelagicus*). Gulls (*Larus sp.*) and sandpipers (*Scolopacidae*) were recovered, and a specimen of small loon (*Gavia sp.*) was also found.

Unfortunately, bird bones are difficult to identify by genus and species, and many site reports simply report how many bird bones were found (Berreman, 1944; Murray, 1983; Snyder and Ross, 1980). This is changing, and avian identification is becoming an important part of an archaeological investigation.

Plants and their Native uses on the Oregon Coast

Pre-contact people of the Oregon coast valued plants for food value, medicinal value, and to manufacture items such as houses, canoes, and tools (Hall, 1984; Harrington, unpublished notes; Walters, 1983). Herbs also had the value of aiding in preparation for the hunt and the Coos Bay area people would prepare for an elk hunt by sweating and rubbing down with herbs to remove their human scent (Harrington, unpublished notes).

Dandelion root (*Taraxacum officinale*) and cascara bark, which is still used today, were good laxatives (Ward, 1986). Wild cherry root (*Prunus emarginata*) boiled with cascara (*Rhamnus purchianus*) was considered a good medicine (Harrington, unpublished notes). Willow bark (Family Salicaceae) was used to combat diarrhea, and dogwood bark (*Cornus* sp.) was good for reducing fever (Ward, 1986).

Ferns and grasses were used to make baskets. Wood was used for canoes, houses, bowls, and tools for making nets. Bark was used to make nets, clothes, medicines, and dyes. Alder limbs (*Alnus* sp.) were used to make flutes, and cedar (*Thuja* sp.) boxes were used for drums (Viles, 1988).

Two species of camas are found in the coast area. Both are in the Lilliaceae family. White, or Death camas (*Zygadenus venenosus*) has a white bloom and is very poisonous. The other camas (*Camassia quamash*), which has a blue or purple flower was a highly valued food item. The camas bulb was the chief vegetable

among the Coquille (Hall, 1984) and other tribes on the Oregon coast. Using a crutch digging stick, "women dug great quantities of camas" (Drucker, 1943:84). A digging stick was made of fire hardened wood with a handle of antler or fire hardened wood (Zucker et al., 1987) that allowed women to pry back and forth on the stick (Beckham, 1977) to extract the bulb from the ground.

Camas bulbs were often baked with salmon or ground into flour after being roasted in an earth oven for several days (Barnett, 1937; Hall, 1984). The flour could then be made into a thick soup or thick cakes to store for winter use (Hall, 1984).

In addition to camas, other root plants were often used. Skunk cabbage root (*Lysichitum americanum*) was used as a spice by the Coquille people (Hall, 1984). One of Harrington's informants was " curious that whites do not eat it" (Harrington, unpublished notes), especially considering that bear eat skunk cabbage and love it. People on the coast state that "everything bear eats is good eating" (Harrington, unpublished notes).

Fern roots were used as food (Drucker, 1943; Hall, 1984) and could be dried and stored for winter (Frachtenberg, 1914). Fern root had to be cooked in an earthen oven, not boiled, and the root was eaten with dried salmon eggs (Harrington, unpublished notes). Raw wild parsnip stalk was eaten (Barnett, 1937; Harrington, unpublished notes) or the root was applied to swelling or crushed and inhaled for colds (Barnett, 1937). Frank Drew had eaten raw cattail root (*Typha latifolia*) which was used by coastal people (Harrington, unpublished notes). Other roots utilized include horsetail (*Equisetum* sp.), seaside lupine (*Lupinus littoralis*), thistle (*Cirsium edule*), white brodiaea (*Brodiaea coronaria*), wild anise (*Angelica hendersonii*), and yampah (*Perideridia oregana*).

Rogers, Jedediah Smith's second in command, notes "raspberries", "strawberries", and "two other kinds of berries that I am unacquainted with" were traded to them (Maloney, 1940:317). Berries were a staple food for people on the Oregon coast.

Roberta Hall, in her book about the Coquille, mentions the use of a "hyme-hyme" (Hall, 1984). This was a simple device that extended a person's reach and was used to gather berries beyond arm's length. Red and blue huckleberries (*Vaccinium* sp.), salmon berries, blackberries (*Rubus ursinus*), salal berries (*Gaultheria shallon*), and blueberries (*Vaccinium uliginosum*) were all gathered on the coast.

Salal berries were dried and made into cakes. These cakes, stored for off season use, would be broken up and used when needed (Hall, 1984). This method of storage meant that fruit was available most of the year. Salmon berries were eaten, especially with salmon. Siuslaw people would also eat kinnikinnic berries (*Arctostaphylos uva-ursi*)(Frachtenberg, 1914). Cascara berries could be eaten in small quantities, but too many would have the same laxative effect as cascara bark. Other berries used include elderberries (*Sambucus* sp.), strawberry (*Fagaria chiloensis*), and thimbleberries (*Rubus parviflorus*).

Acorns (*Quercus* sp.) were more important to the people on the southern part of the Oregon coast than people on the northern coast of Oregon. It was noted that "if you don't eat acorns offered you at Smith River it is regarded as an insult" (Harrington, unpublished notes).

Acorns would be soaked in water to remove the bitterness. Other methods of removing the bitterness were: (1) to bury the acorns in mud, allow them to get moldy, then dry and pound them or roast them, (2) to leach the acorns in a sand basin. The acorns were ground in a stone mortar and eaten as a mash or as cakes (Ward, 1986).

Small round cakes or patties were made of sea weed and then dried in the sun. Dried sea weed patties were dipped in oil as a treat for children (Viles, 1988). Lottie (Harrington, unpublished notes) mentioned that only darker sea lettuce was gathered, not the red kind. Sea weed was eaten with meats (Ward, 1986), which probably added flavor to the meat. The Coquille would steam-cook mussels and other shellfish in layers of sea weed.

Pre-contact people of the Northwest appeared to have cultivated tobacco (*Nicotiana* sp.) (Barnett, 1937). Tobacco was being cultivated near the Chetco river in 1828 when Jedediah Smith's party went up the coast (Maloney, 1940:307-308). Brush and logs would be burned to prepare the fields (Barnett, 1937).

Tobacco was smoked with visitors or when meeting a friend. It was also smoked by shamans, or while praying. Tobacco seems to have been smoked ritually and was not used every day (Hall, 1988). Before going hunting an offering of tobacco was tossed into the air (Barnett, 1937).

Tobacco was often mixed with kinnikinnic (*A. uva-ursi*) leaves (Drucker, 1943) or with beach weed (Barnett, 1937) before smoking. Kinnikinnic smoke has been described as "sweet, mild and cool" (Walters, 1983). Kinnikinnic was often smoked on the coast (Ross, 1988) instead of tobacco. Pipes have been found at Umpqua/Eden (Ross and Snyder,1986) and by Schumacher (1874) and at Bandon (Lindsay, 1989) on the southern coast. Three types of pipes were used: a straight wooden pipe and an elbow type with a stone bowl and wooden stem (Drucker, 1943), and clay pipes (Wasson, 1988). Pouches for tobacco were usually made of buckskin (Barnett, 1937; Drucker, 1943).

Manufacturing Materials

On the Oregon coast, prehistoric people's principal resources were organic materials from plants or animals. Stone (lithic) material was used, but not as extensively as inland tribes used it. Stone tools are the artifact most commonly associated with prehistoric people, because stone is the most durable of the materials people used in prehistoric times. Because of the preserving effect of shell middens, more bone artifacts are recovered from coastal sites than are usually found with inland sites. Lithic and clay materials were important to coastal people, but tools of bone and wood were used more often.

Wood was used for many things. Cedar (Family Cupressaceae) was popular and was used to build houses. Prehistoric people of the Oregon coast worked primarily with red cedar (*Thuja plicata*), which is soft, malleable, and even-grained. The native wood worker would use many tools: adzes, chisels, wedges, mauls. The adze was the principal cutting tool and was used to plane the wood as well. A log would be split by driving wedges in, with the grain, along the log.

Houses were often large rectangular pits about four or five feet deep, the sides lined with cedar planks. The gabled roof was supported by posts in the corners and ends. Poor people may have only had tule mats hung over the dirt walls. Tule mats covered the earth floors of all houses and, though there was no furniture, there were sleeping platforms around the sides of the house, with a fire hearth usually in the center of the house (Drucker, 1943; Hall, 1984).

Yew (*Taxus brevifolia*) was the preferred wood for bows (Barnett, 1937; Drucker, 1943). Yew wood was cut in the winter when the sap was down. The wood was shaped with stone knives and then scraped with a clam shell, and, finally, smoothed with sandstone (Ward, 1986). Alsea bows were from three to four feet long with a two-ply sinew cord for a bowstring (Drucker, 1943). Arrows

would be made of hazel wood (*Corylus cornuta*)(Ward, 1986). Vine maple (*Acer circinatum*) was a secondary choice for bows.

The Alsea were noted as fine canoe builders (Harrington, unpublished notes) and their canoes were sought after. Lottie's father, Chief Jackson of the Coos (Harrington, unpublished notes), bought an Alsea-type canoe with a four-foot-wide gunwale inlaid along the center with ground agate embedded in pitch which he brought home via the ocean to Coos Bay. When he died, he was buried in the canoe (Harrington, unpublished notes).

Canoes could be small, one person size, or larger and hold many people. Ocean-going canoes were reported to be 40 to 50 feet long with a wide gunwale (Ward, 1986). There is some controversy among archaeologists as to whether ocean-going canoes were used on the central Oregon coast.

Several types of baskets were made by coastal people, among them storage baskets, and burden baskets for gathering food. Cooking baskets, which were water-tight, were used to boil water by dropping hot stones into the water until it boiled. A water-tight basket was made of spruce roots woven tightly together (Harrington, unpublished notes). Hoppers, baskets without bottoms, were used to hold items being ground in a mortar. There were flat basket plates and flat sifters, and there were even woven cups (Barnett, 1937).

Hazel sticks were used in basketry (Harrington, unpublished notes). The sprouts would be peeled and then dried in the sun, after which they could then be woven into baskets. To make a white pattern, coastal people would use bear grass (*Xerophyllum tenax*). They would use dyed alder to make the red in their baskets (Brown, 1977), using hemlock to make the red dye (Barnett, 1937). Maidenhair fern was used for the black in Coos basketry.

Other woven items, such as the tule mats that were used for sitting and sleeping, could be woven with pictures of birds, animals, or other symbols decorating them (Ward, 1986). Clothing was made of cedar bark, usually a knee-length skirt or apron (Barnett, 1937; Drucker, 1943). Woven caps were used to keep the rain off (Barnett, 1937).

Obsidian was not very common to the people of the Oregon coast. One percent of the stone tools found at the Bullards site (35CS1) were obsidian, and at Yaquina Head (35LNC62) on the central Oregon coast, obsidian made up 0.5% of the lithic artifacts (Minor and Musil, 1987). Obsidian was highly valued and was considered a wealth item (Boas, 1898; Ward, 1986). Large blades of obsidian were considered to be powerful wealth items (Viles, 1988). On the northern part of the Oregon coast it was believed that to find obsidian would cause bad weather, and if you found a piece of obsidian in the winter you left it until warmer weather came (Boas, 1898). Most of the obsidian used on the coast is believed to have been traded for from eastern tribes.

More common than obsidian was the use of materials such as jasper or chalcedony. When material other than obsidian was used, the material was heat treated. Stone would be buried in sand and slowly heated to 400 to 900 F, depending on the type of stone. It would then be left to cool for twelve hours. This would relieve the internal stresses in the stone and make the stone more elastic and easier to work (Crabtree, 1972). Non-flaked tools would be made by grinding. Basalt and sandstone were used to make tools such as mortars, pestles, and abraders.

There are many types of stone tools used on the Oregon coast. Flaked stone knives and drills are all part of the Native American tool kit. There were also stone scrapers to clean hides or shape wood. The flakes from making flaked

tools could be utilized as convenient disposable knives. Choppers and adze blades were used to cut and shape wood. Abraders made of sandstone, siltstone, and mudstone were used to smooth wood after shaping. Hammerstones were used to shape stone into working tools. Stone line or net sinkers were also used. Mortars and pestles were used to grind nuts and roots. Stone pipes have been found; the hole was bored into the stone by using a tool similar to a bow-drill (Schumacher, 1874).

Figures of sunbaked clay (Phebus and Drucker, 1979; Ross and Snyder, 1986) have been found on the Oregon coast, but have not yet been studied or analyzed. Whether these are similar to the clay figurines found in California (Heizer and Beardsley, 1943) is not known yet. Baked clay pipes with incised decorations have been found on the lower Umpqua river (Wasson, 1988)

Bluing was used by southern coast people. This was made by mixing a blue mineral, gathered at the mouth of Cook's chasm, with elk or deer tallow. It was then painted on their bodies. The mineral proved to be potassium cyanide (Harrington, unpublished notes).

Bone was one of the most available resources for manufacturing tools; the only resource more available was wood. People on the Oregon coast made many items from bone, such as needles, hooks, and whistles. Spoons were made of bone (Schumacher, 1874) or antler (Barnett, 1937). Wedges for splitting wood were made of antler. Other items made from bone were: digging stick handles, gaming dice, harpoon heads, and arrow and spear points.

Bird bone whistles (Hall et al., 1990; Leatherman and Krieger, 1940; Ross, 1975) and decorated bird bone have been found (Ross and Snyder, 1986). A whale-bone salmon club (used to kill salmon after they were caught), antler flaker (used to remove flakes from stone to make tools), and a harpoon head were found

(Ross, 1977). Bone harpoons and bone points have also been found (Hall et al., 1990; Phebus and Drucker, 1979).

Yaquina Head (35LNC62) investigators recovered bone and antler tools. They found many items such as bone needles, wedges, split bone awls, and a carved whale bone artifact. Other bone artifacts recovered from Yaquina Head include: decorated bone, an antler net shuttle, and antler wedges (Minor and Musil, 1987).

The Oregon coast people had a wide variety of resources available to them. The different resources influenced the type of tools that were needed and the type of artifacts that were made. This means that the available resources influenced the types of tools that can now be found in archaeological sites on the Oregon coast.

Chapter 3

TYPOLOGICAL THEORY, BACKGROUND, AND METHODS

Archaeologists in the United States are trained as anthropologists and are expected to answer questions about the cultures of prehistoric people. Culture is the system of shared meanings that are learned and used in interacting with ones' surroundings, communicating with others, and coping with the world (Jolly and Plog, 1987). Archaeologists attempt to construct an accurate representation of past cultures (Taylor, 1983) from a few artifacts or fragments of artifacts. Many aspects of prehistoric culture do not survive in the archaeological record, such as the methods of teaching the young, the various ceremonies, and methods of crafting tools and ornaments (Taylor, 1983). In order to construct a picture of the past, archaeologists have developed methods of ordering data gathered from archaeological sites.

In order to be able to construct a picture of a culture from the artifacts that survive, it is important to understand how a culture creates an artifact. First it must be understood that artifacts in themselves *are not* culture, they are "... the result of certain culturally conditioned behavior" performed by the artisan (Rouse, 1939:16). Culturally conditioned behavior can be influenced by two major factors; environment and social change.

Environment and social change are factors which can influence and bring about change in the artifacts a culture will produce. The environment can influence culture through changes in food resources and changes in the availability of raw materials. The second influence on artifact types is social change, such as trade, emigration, or conquest by another culture.

Environmental and social influences are assimilated by a culture through a social/cultural filter which determines if the change is to be accepted or rejected

(Figure 4). Environmental changes may bring about a migration to a more acceptable environment, thereby rejecting the changes that staying in the original

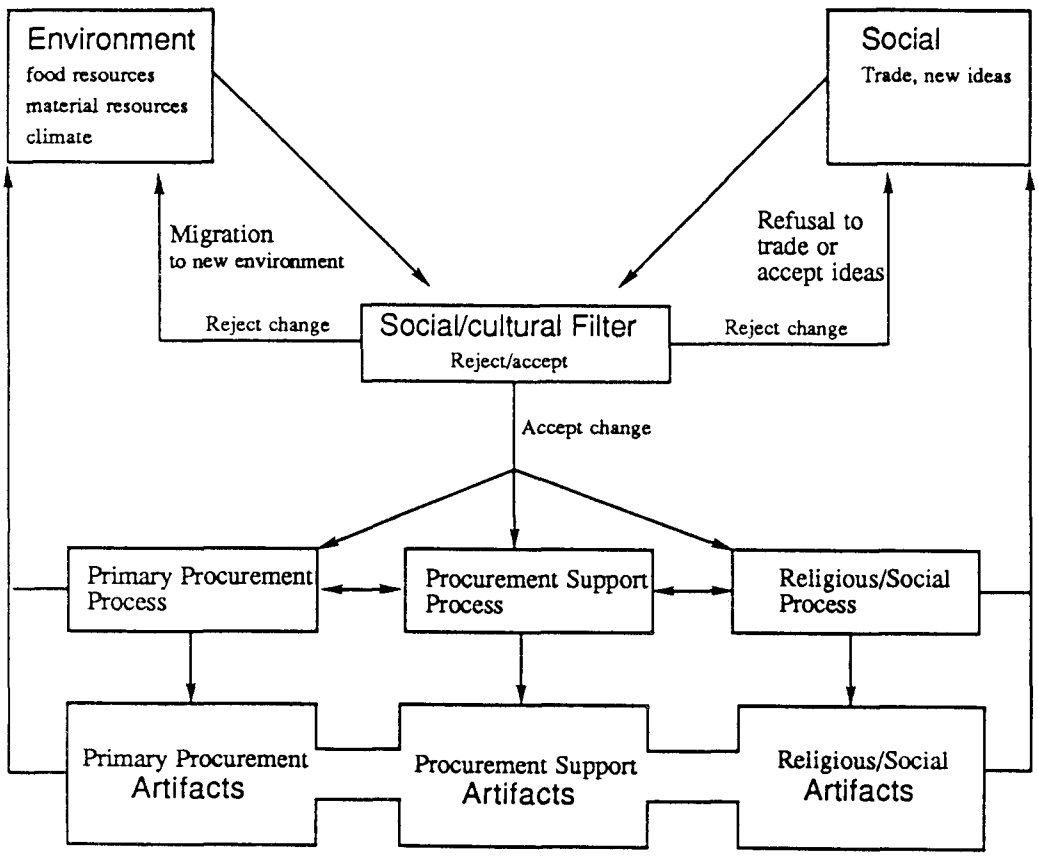

Figure 4. The cultural processes that influence artifact types.

environment would have brought to the culture and to the artifacts the culture produces. The social/cultural filter may bring about a rejection of social changes through rejection of new ideas from outside the culture rather than assimilation of them. The other alternative is for the culture to accept change. Once the change is accepted it affects the primary procurement system if the change affects food gathering, the secondary support system if the change affects food preparation or preparation of tools for the primary system, or the religious/social system if the

change affects the religious or social aspects of the culture. These systems then in turn affect each other and affect the artifacts produced by each system. There is then a feedback from these three systems and their artifacts to the environmental and social influences.

As archaeologists attempted to understand past cultures it was realized that some way to order the archaeological data was needed. Other disciplines have used various methods to order their data. Botany, zoology, and ecology all have methods of ordering data so that the data can be understood and compared such as the Linnean binomial nomenclature or the ecologist's plant associations. All of these methods come under the name of taxonomy. Taxonomy is defined as "the science of arranging the myriad forms" (Simpson, 1945:1). As a science, taxonomy has a set arrangement of principles and laws. Taxonomy's most important function is to systematically organize data (Davis, 1972), to place objects in relation to each other. Within taxonomy, the next level of abstraction is classification (Davis, 1972).

Classification is the grouping of objects on the basis of their characteristics or properties (Simpson, 1945). These characteristics or properties can be called attributes. In archaeology, there are two important concepts that deal with attributes. The first concept is that of mode. A mode is a single attribute (Rouse, 1939), such as shape *or* notching *or* pattern of design, *or* material from which the artifact was made. The second concept in archaeological classification is that of type. A type is the pattern of attributes (Rouse, 1939), how the attributes are put together to form a single artifact. This would be the placement of the notch *combined* with the shape of the artifact *combined* with other attributes. This idea of type has given rise to the next level of abstraction in taxonomy, that of typology.

Typology is the grouping of like items using an ideal or standard type (Rouse, 1939) which is based on attributes *selected* by the investigator which the investigator deems to be significant (Davis, 1972). It must be remembered that the investigator chooses the attributes that he thinks are important. Types and modes are concepts, these concepts are tools to be used by archaeologists (Rouse, 1939). Typology is "an instrument for testing our hypothesis" (Vierra, 1982:167).

Types are patterns of attributes. There are four main attributes that need to be considered when formulating a type. These attributes are comparable to Aristotle's four causes (Matson, 1987: 118-119). These four causes are from Aristotle's philosophy of nature. Aristotle believed that every object had these four causes inherent within it. The four causes are the material cause, formal cause, efficient cause, and final cause (Table 2). The material cause is that from which the artifact came, the material (such as bone, stone, clay, etc.) from which the artifact was constructed. The material used to construct the artifact limits the possible forms the artifact can take and in turn the materials available are limited by the environment. The formal cause is the form or pattern for the artifact. This is the idea, formula, intent, or mental template (Deetz, 1967) of the designer when he constructed the artifact. The formal cause is not easily reconstructed from the archaeological record and most often must be inferred. The efficient cause is that which gives the immediate origin of the artifact, the makers' actions, such as flaking stone or carving bone. These actions dictate how close to the original idea (form or template) the final product will be. This is where the skill of the artisan can come into play and where the nature of the process can influence the final product.

Table 2. Aristotle's four causes and their use in archaeology.

Cause	Manifestation	Example
Material cause	Material	Stone, bone, clay, etc.
Formal cause	Idea, formula	Tool to hunt fish.
Efficient cause	Manufacture	Flaking stone, carving bone, etc.
Final cause	Function or Purpose	To catch fish.

There are two methods of manufacture (Deetz, 1967). There is the additive process where an object is built up. An example would be weaving a basket, where you start with the materials and gradually add to the product until it is complete. If a mistake is made in a additive process the artisan can simply reverse the process and correct the error. The second process is the subtractive process. This is where the artisan removes portions of the raw material and shapes the object. Flaking stone to form a knife is an example of the subtractive process. With the subtractive process there is no way to correct an error, the artisan either continues and works around the error or disposes of the incomplete object and starts over. Errors that have been made in the subtractive process could be the cause of unusual or one-of-a-kind artifacts.

The final cause is the end for which the artifact was made, the artifact's purpose or function. This is not always apparent and must be inferred from the artifact's shape, from similar artifacts, or from ethnographic records. The purpose of an artifact can sometimes be learned from experimental archaeology, where the archaeologist attempts to construct or use an artifact in a way that is believed to be the way that native people used the artifact. Archaeologists use experimental archaeology to test hypotheses about artifacts' function.

Each of the four causes also influence each other. The material cause can effect how close the object is to the mental template; an error in a subtractive

process can greatly effect how well the object can be used for the final cause. Each cause affects the others and this interaction must be considered in the analysis of an artifact. When researching a typology these four causes should be considered: (1) the material, (2) the formal cause, (3) the manufacture or efficient cause, and (4) the function or final cause.

A radical cultural change can sometimes be indicated in artifact type changes. Some cultural changes cannot be seen in the artifact types, i.e., changes in dance styles, social courtesies, or language idioms. Radical changes such as the change from hunting rabbits to hunting sea lion would result in an obvious artifact change. Rabbits were often hunted with snares; the resultant artifacts would be cordage. Sea lions were hunted with spears and clubs; the resultant artifacts would be spear shafts, spear points, and clubs, as well as cordage. If a change from cordage to spear shafts, spear points, clubs, and cordage were noted in the archaeological record of a site, then the archaeologist would know that there had been a major change in the culture.

The artifacts that will change most are those that are the most elaborate. Pragmatic items such as awls, punches, flakes and flakers will not change as readily or obviously as those with more elaborate design. The term pragmatic is used to refer to those items that are simply made with no effort for style; items that are meant to be used as long as needed and are expected to be broken and replaced often. These tools are simply and easily made from materials that are available in most areas. Pragmatic tools are also tools that are useful wherever people are. An awl is useful on the coast or in the mountains.

Specialized tools will not always be useful when there is a change in the culture. A harpoon cannot easily be used to hunt deer. A change in raw material can change the tool types, but is only likely when there is a major change in

location, a dramatic environmental change, or supplies of raw materials run out. Manufacture is the variable that is most likely to show variation in the archaeological record. Manufacture involves time, energy, and imagination on the part of the manufacturer, and it is in the hands of the manufacturer that the type will vary. Additionally, the manufacturer will devote the most time and imagination to the items that will last the longest or the items that the manufacturer believes need the most attention, perhaps for spiritual reasons, such as placing an image of the animal being hunted on the tool to aid the success of the hunter.

Specialized artifacts, rather than pragmatic artifacts, will change. Pragmatic tools are mostly opportunistic. A broken piece of bone can quickly be turned into an awl, or a stone flake is easy to use for quick cutting jobs. It has been stated "... so long as the tools functioned in the subsistence system and the other boundaries were not violated, the actual shape of any given part of the artifact was unimportant"(Ames, 1976:101). The shape of an awl does not matter as long as there is a long point capable of piercing as needed. This is not so with the more elaborate artifacts. When a culture changes, the pragmatic tools will still be useful and not likely to change, but elaborate specialized tools will change because people's needs will change. An awl will still function the same and is useful for piercing seal hide, deer hide, or buffalo hide. An awl's usefulness is still the same in most regions of the world. On the other hand, a unilateral harpoon will not be as practical as an atlatl dart for hunting deer, whereas it is practical for hunting seal or sea lion. The pragmatic artifacts remain useful even when the group moves or the environment changes, the specialized artifacts may not remain useful.

Three main archaeological type groups have been identified (Ames, 1976; Roll, 1974). One is the primary procurement type. These tools are those used to gather food resources, such as harpoons, fish hooks, and digging sticks. The

second is the procurement support type. These are items used to manufacture primary procurement items, to process food, and to manufacture clothing and housing. Examples are flakers, awls, and knives. The third category is the religious/ornamental type. These are artifacts that are not primary procurement or support items, items such as pendants and wands. This group also includes items of unknown or unidentified purpose.

Items in the primary procurement and procurement support categories tend to have two variations. There are those items that are purely pragmatic tools with little or no effort put into their manufacture. These are often simple, multifunctional, expendable items, used once or twice then discarded. These pragmatic tools include awls, punches, wedges, flakes, and flakers. Little effort would be put into the manufacture of these tools because their lifetime was short. Pragmatic tools have little cultural variation. Attributes that relate to the function of a tool, the raw material and the method of manufacture do not vary significantly (Ames, 1976).

The second variation of the primary and support items are those which have more time and energy put into their manufacture. The time and energy it takes to carve items such as harpoons from bone or antler is much greater than the time it takes to make an awl. Tools such as a harpoon or a fishhook are expected to last for a long period of time and for more than one use. There is also the need to show respect for the animal hunted.

The basic tool of material and non-material cultural research in anthropology is the type (Ford, 1954). Types give anthropological researchers a method of cross comparison. It *must* be remembered that the artifacts (buildings, pottery, tools, etc.) are cultural products and are *not* the culture (Ford, 1954). One reason for the creation of the artifact type was to permit comparison of artifacts between

sites (Deetz, 1967). Typology is not an end in itself, "... but is rather a by-product of the search for culturally imposed order"(Vierra, 1982:165).

Artifacts are categorized by their having certain characteristics in common with each other. Many approaches have been used, such as cluster analysis, principle component analysis, and factor analysis, to find types. Cluster analysis involves searching for "natural" breaks between groups, where many variables are measured and plotted. This method attempts to find those objects which form a cluster. Those objects which form a cluster are considered to be a type. Another method is the use of Chi-square to test whether or not chance variation alone could have produced the differences between artifacts (Joukowsky, 1980), but to use this method a large number of samples are needed. Other methods are used such as four-cell coefficient of association (Spaulding, 1953) which measures the association of two attributes. New methods are appearing all the time, but before these methods are used it is important to remember that caution must be taken when determining a type.

There are some problems associated with typology. First we need to remember that the variables that we use are *our* own constructs (Voorrips, 1982) and these variables will not necessarily have had any importance or meaning to those who constructed the object. We must remember that we are looking at the object through our own cultural filters. Second, the artifacts give us a "snapshot" view of a very fluid cultural process (Ford, 1954). We are only looking at one place at one time. This can limit our view and cause us to assign cultural barriers where none existed, or barriers which had less effect than we think (Ford, 1954). There is also the possibility of assigning separate types to two objects which are in fact only variations of the same type (Ford, 1954).

Typological Methods

The first method for formulating a typology involved the use of the experience and intuition of the archaeologist rather than statistical methods. This can be referred to as the intuitive method of typology. The archaeologist must choose which factors are important for the separation of the types. The need to choose the factors used to formulate the typology is still important, but quantitative methods have been added to help the archaeologist.

In recent years the need to be "scientific," which is often incorrectly defined as using more statistics rather than using the scientific method, has led to the misuse of statistics and to blind reliance on automation. Statistics and automation can be misused by investigators who just plug every possible variable into a computer and let the computer decide the breaks between groups. This can happen when statistical analyses are performed without consideration of whether or not the method is applicable in the given situation (Voorrips, 1982). This misuse of statistical methods can lead to several "Mickey Mouse laws" because there can be several artificial relationships among the important relationships (Voorrips, 1982). The investigator must first understand the underlying relationships between the variables. Is length just part of the same variable as width (area) or are they separate variables each independent of the other? An investigator must consider the relationships between variables before using statistical analysis. For example, it is possible that several variables are all measures of one underlying dimension, which, if all variables were given equal weight, would over-emphasize the underlying dimension (Whallon, 1982). It is just as incorrect to arbitrarily give differential weight to different variables as to arbitrarily give equal weight to all variables (Voorrips, 1982). The relationships between variables must always be considered. The data must be screened and analyzed. The investigator must also

be careful, when using principal component or factor analysis, to extract or define the underlying dimensions, because the use of these complex techniques is often incorrect for the type of data found in archaeology. The analyst must be careful to use the techniques properly and choose the correct variables (Voorrips, 1982; Whallon, 1982). The analyst must always remember that a typology is "... an instrument of measurement to use in testing our hypothesis" (Vierra, 1982:167). Typologies are not an end in themselves but only a method for analysis of artifacts.

Typological Criteria

The purpose of this thesis is to develop a basic typology for bone artifacts excavated on the Oregon coast, a typology which can be expanded later. Non-pragmatic artifacts were given emphasis because more time and effort was expended in their manufacture and these artifacts are more likely to vary as the cultures vary. Pragmatic tools do not vary significantly along the Oregon coast and the same artifact types are in many sites along the Oregon coast. Furthermore, the pragmatic tools are the same or very similar to those found in Washington and the rest of the northwest coast.

There was no need to use statistical methods to determine variation or the breaks between types in this study. The criteria chosen divided the types along major differences such that each type presented in this paper is significantly different from all the other types.

The criteria used to determine the separate types in this study were: (1) the artifact must be made from bone, antler, or tooth; (2) the use of the artifact as determined from previous experimental archaeology or ethnography; and (3) where

artifacts were used for similar purposes, major differences in attributes such as shape, decoration, or size were used for ordering purposes.

The first criterion was used to separate the lithic materials from the bone, antler, and tooth materials with which this study is concerned. The second criterion was used to separate the artifacts by determined purpose. This separation of the artifacts by determined purpose is necessary for the study of culture. It is important to attempt to understand the purpose of the artisan and to treat the artifacts from the standpoint of the native people (Rouse, 1939). Because the artifact itself is not culture, the archaeologist must try to understand those that created the artifact and this begins by trying to separate the artifacts as the artisan who made the artifact might separate them, always realizing that the archaeologist may be mistaken. The third criterion was used to separate the artifacts of similar purpose by obvious differences in shape or decoration. This again tries to separate the artifacts into categories that the native people might have used within the larger category. Examples are categories such as unilateral harpoons as opposed to bilateral harpoons. These types can further be divided into subtypes such as unilateral harpoons with line-eyes as opposed to those with line-guards.

Artifacts from various sites were examined as were site reports. The above criteria were used to classify the artifacts and to determine if any new types existed. Research was limited to site reports which were accessible and had non-lithic artifacts. Therefore, this paper does not include all sites on the Oregon coast, but does contain a sampling from all along the coast and covers a large time span.

Chapter 4

OREGON COAST NON-LITHIC ARTIFACT TYPES

Examination of several site reports has yielded enough information to present a non-lithic artifact typology. Three criteria were used: (1) the artifact must be bone, antler, or tooth; (2) the use of the artifact as determined by ethnographic or experimental archaeology and; (3) the obvious differences in shape or decoration. This typology for the non-lithic artifacts found on the Oregon coast is now presented in this chapter. Location of the report which was used to define the type specimen for each type is listed with the type description.

1-0. Unbarbed Bone or Antler Bipoints/Unipoints (Ames, 1976; Roll, 1974). See Figure 5.

1-1. Bipoints of bone or antler are manufactured by carving and fine grinding. The bipoints are elongated with one end sharply acute. It is most likely that these bipoints are for composite toggling harpoons. The sharply acute end fits into the harpoon valves and the foreshaft. The other end of the bipoint is less acute and is intended as the piercing portion of the harpoon. The bipoints range in size from 4.2 to 5.1 cm in length and 0.6 to 1.1 cm in width (Bennett, 1989). It is also possible that bipoints were used as fish gorges. Type specimen found in Ames (1976).

1-0. (Continued)

1-2. Bone bipoint similar to 1-1 but 8 cm long with a carved collar near the head of the bipoint. The base is acute as in 1-1 and designed to fit a socket. There are four rough facets with numerous cross-hatchings. The cross-hatchings may be decorative or may be to aid in securing the lashing for the barbs. This is most likely a point for a composite toggling harpoon. Type specimen found in Lindsay and Keith (1986).

1-3. Blanket pins are similar to 1-1, but are longer in length. Blanket pins range from 10.0 to 13.7 cm in length and are more rectangular in cross section than 1-1. The functional name is derived from similar artifacts used by the coastal Salish to secure blankets. Type specimen found in Bennett (1989).

1-4. Unipoints similar to 1-1, but rather than an acute basal end the unipoint has a slightly rounded base. The size of unipoints range from 4 to 7.5 cm. These unipoints could be fish rake teeth, fish gorges, fish hook barbs, or points for arming composite toggling harpoons. Type specimen found in Clark (1989).

1-5. A unipoint similar to 1-4 but with an expanding base. Type specimen found in Leatherman and Krieger (1940).

2-0. Composite Harpoon Valves (Drucker, 1943; Roll, 1974). See Figure 5.

These are barbs designed to be fitted over a bone or wood point (type 2-2 is designed for bone, shell, or lithic points) and socket for a shaft which is used to thrust the point and barbs into the prey. There are three size ranges of composite harpoon valves (Roll, 1976). The 5.0 cm size is believed to be used for salmon, the 7.0 to 8.5 cm sizes are believed to be used for seals, and the 12.5 cm size is thought to be used in whaling. The 12.5 cm size has only been found in northern Washington.

2-1. Form/type I has a smooth body and spur. The valve is grooved to accept a small bipoint and has a second groove for the foreshaft. Type specimen found in Roll (1974) and Drucker (1943).

2-2. Form/type II is similar to 2-1 but with a constricted body and expanded head. This type is also stepped rather than grooved. This type is designed to hold a flat lithic, shell, or bone point with the constricted body and expanded head to aid in lashing the point. Type specimen found in Roll (1974).

2-3. The third category is similar to 2-2 but without the groove or step for arming the harpoon. It is suspected that this is a preform. Type specimen found in Clark (1988).

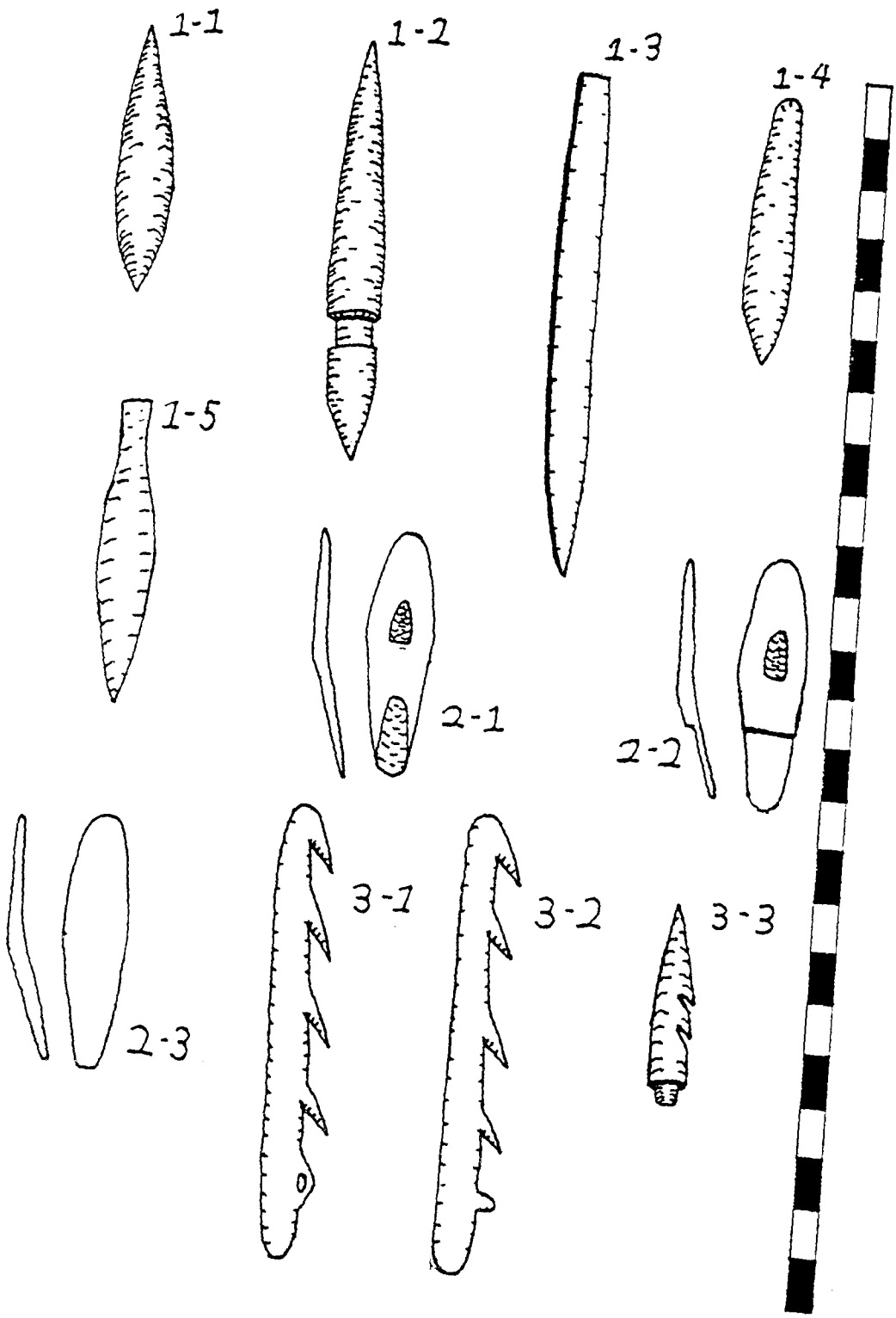

Figure 5. Bone artifact types 1 to 3.

3-0. Unilaterally Barbed Harpoon Heads (Drucker, 1943). See Figure 5.

3-1. Unilaterally barbed harpoon head, with low, multiple, isolated barbs. There is a single line eye at the base of the harpoon. The harpoon is approximately 9 cm in length, the barbs 1 cm apart and 0.5 cm high. Type specimen found in Minor (1983).

3-2. Unilaterally barbed harpoon head similar to 3-1, but without the line eye. Instead the harpoon has a unilateral line guard. Also has three to seven barbs. Type specimen found in Ross and Snyder (1986).

3-3. Unilateral barbed harpoon head with two barbs. This harpoon head is 4.5 cm in length and is socketed to fit on a shaft. Type specimen in Newman (1959).

4-0. Bilaterally Barbed Harpoon Head (Drucker, 1943). See Figure 6.

4-1. Bilateral isolated symmetrical harpoon head. Four barbs, two per side. Carved notches toward the base of the harpoon for attaching the line. Type specimen found in Minor (1983).

4-2. Bilateral enclosed asymmetrical harpoon. Notched for attaching the line. Size unknown. Type specimen found in Phebus and Drucker (1977).

4-3. Harpoon similar to 4-2 but slotted to receive lithic, shell, or bone point. Type specimen found in Phebus and Drucker (1977).

5-0. Bone Projectile Points (Hall et.al, 1990; Lindsay and Keith, 1986). See Figure 6.

These are unusual specimens that do not seem to appear in any other areas of the Northwest coast.

5-0. Continued

5-1. Bone side-notched projectile point. The artifact is 4.6 cm long. Manufactured by carving and grinding the bone. The artifact has side-notches. The base was incomplete, but appears to have had a large V-shaped notch in the center of the base. This point may have been for a slotted harpoon head. Type specimen found in Hall et al. (1990).

5-2. A diamond-shaped ground point. This point is 5.8 cm long and 1.6 cm at its widest. This artifact was found with a complete burial. The artifact may have been made specifically as a grave good. It is also possible that the artifact may have been a hunting point for a composite toggling or a slotted harpoon although it appears to be too thin at 0.2 cm, or it may have been a head-scratcher, although with the burial being male (Hall, 1986), this may be questionable. Type specimen found in Lindsay and Keith (1986).

5-3. Triangular point 3.8 cm by 1.7 cm with straight parallel sides that abruptly taper into an sudden tip. The base is slightly convex. It is thought to be a pendant preform. Type specimen found in Clark (1988).

5-4. A diamond shaped bone artifact ground to a sharp point. One end is shouldered and contracted, probably so that it could be hafted in a socket. The point is 13 cm long and approximately 1.5 cm at the shoulder. Type specimen found in Newman (1959).

6-0. Bone or Antler Fish Hooks (Roll, 1974). See Figure 6.

6-1. Large J-shaped fish hook 10 cm long with a maximum width of 2.9 cm. These have a large thick body that tapers at the base of the shank and curves into a U-shape to form the hook. These had a longitudinal slit for lashing or a notch. Type specimen found in Bennett (1988).

6-2. Hooks similar in shape to 6-1, but the shank is thin. The shank is straight and the length is 5.4 cm with the barb either straight or curved. Type specimen found in Clark (1988).

6-3. Similar to 6-2, but with a shorter shank that is slightly curved. Type specimen found in Berreman (1944).

6-4. Similar to 6-2, but with an eye at the end of the shank. Probably historic. Type specimen found in Phebus and Drucker (1977).

6-5. An antler shank of a composite fish hook. The section is 15.8 cm in length and slightly curved. The larger end has a carved sloping groove 1.5 cm long for attaching the barb. Type specimen found in Clark (1988).

7-0. Spoons of Bone or Antler (Bennett, 1988; Hall et al., 1990). See Figure 7.

7-1. Bone spoon manufactured from the distal end of a terrestrial mammal bone. This uses the natural shape of the bone to form the bowl. The artifact is smoothed and polished. The size is 9.1 by 2.8 cm. Type specimen found in Bennett (1988).

7-2. An antler spoon manufactured by carving and polishing. The size of the bowl is 2.6 cm by 3.1 cm. The handle is 3.7 cm long and 0.4 cm wide. Type specimen found in Hall et al. (1990).

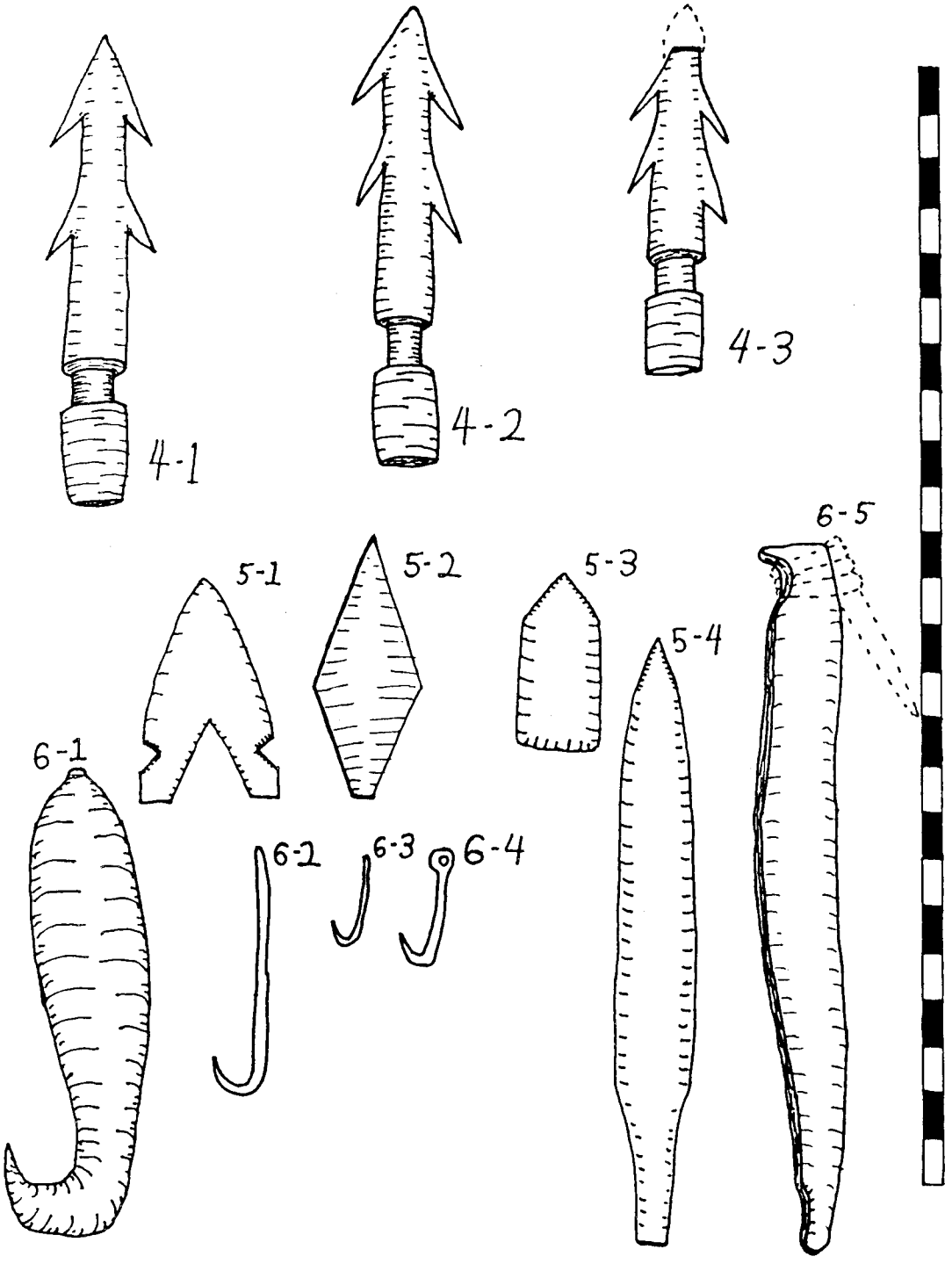

Figure 6. Bone artifact types 4 to 6.

8-0. Bone Knife (Newman, 1959). See Figure 7.

8-1. A knife blade manufactured from a flat bone element. This knife has a broad spatulate blade. Type specimen found in Newman (1959).

8-2. Similar to 8-1, but more elongated and with a perforation in the middle for suspension. Type specimen found in Newman (1959).

9-0. Headscratcher/pendants (Berreman, 1944). See Figure 7.

9-1. Lancolate shaped artifact 9 cm long by 2 cm wide. This object has 46 pits drilled in longitudinal and horizontal rows. There is one hole drilled through the base end to run a cord through to suspend the artifact. This object is thin (0.18 cm) and slightly curved. This object could be a pendant, but also resembles the objects Berreman (1944) identified as headscratchers. Type specimen found in Hall et al. (1990).

9-2. Similar to 9-1, but thicker and decorated with incised lines and triangles (Mace, 1986). These objects range from 8 to 10 cm and from oval to lanceolate. Type specimen found in Berreman (1944).

9-3. Pendant which is lanceolate shaped. Has a bipoint design carved through the center. One end of the pendant has a hole drilled into it for suspension. Type specimen found in Clark (1988).

10-0. Decorated Tooth (Berreman, 1944). See Figure 7.

10-1. A boat-shaped half of a sea mammal canine tooth and decorated with incised lines. One end is grooved, possibly to attach the object as a pendant. Type specimen found in Mace (1986).

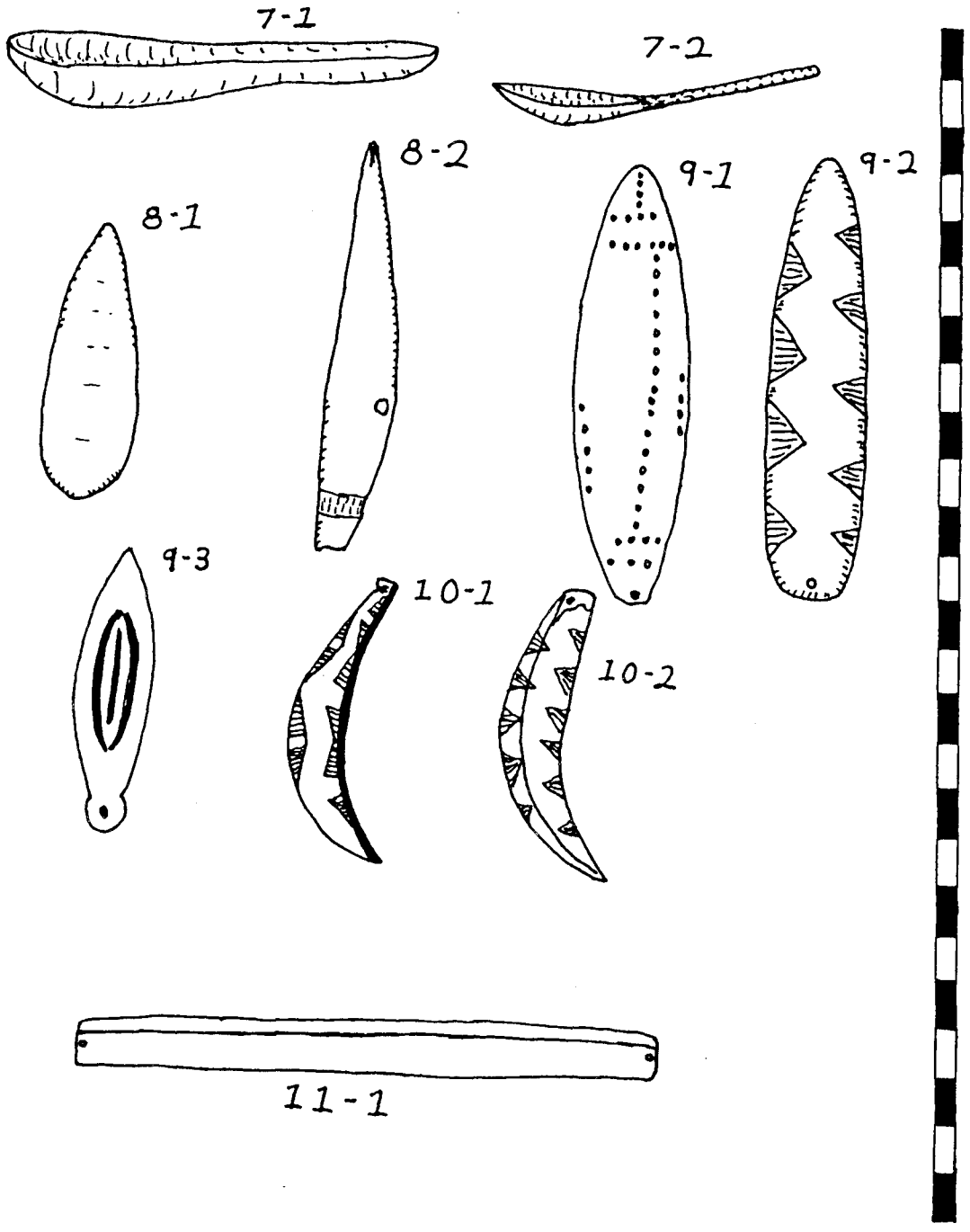

Figure 7. Bone artifact types 7 to 11.

10-0. (Continued)

10-2. An entire canine tooth either decorated with incised lines or not decorated at all. One end has a hole drilled through it to run a cord for suspension. These are also likely to be pendants. Type specimen found in Berreman (1944).

11-0. Headband spreaders/bracelets (MacLaehlan, 1981). See Figure 7.

11-1. Long rectangular objects 12.8 cm in length by 1.5 cm in width. Carved lines for decoration. Northern tribes used bone artifacts of similar design to flatten a leather trumpline used to help carry burden baskets. These were also approximately 12 cm in length (MacLaehlan, 1981). The bone artifacts from Oregon could also be headband spreaders used for the same purpose. Type specimen found in Bennett (1988).

12-0. Carved Zoomorphic, or Anthropomorphic Figures (Newman, 1959). See Figure 8.

12-1. A figure carved from bone or antler. These figures represent animals, real or imaginary. These figures are greater than 10 cm in length. The maximum length is unknown, but is greater than 18 cm. The features are carved. Type specimen found in Newman (1959).

12-2. A long slightly curved object 33 cm long. A plain handle at the base of the object. Carved lines form the figure, either animal or a man dressed as an animal. The surface is grooved for two-thirds of the length. This object was identified as a wand. Type specimen found in Newman (1959).

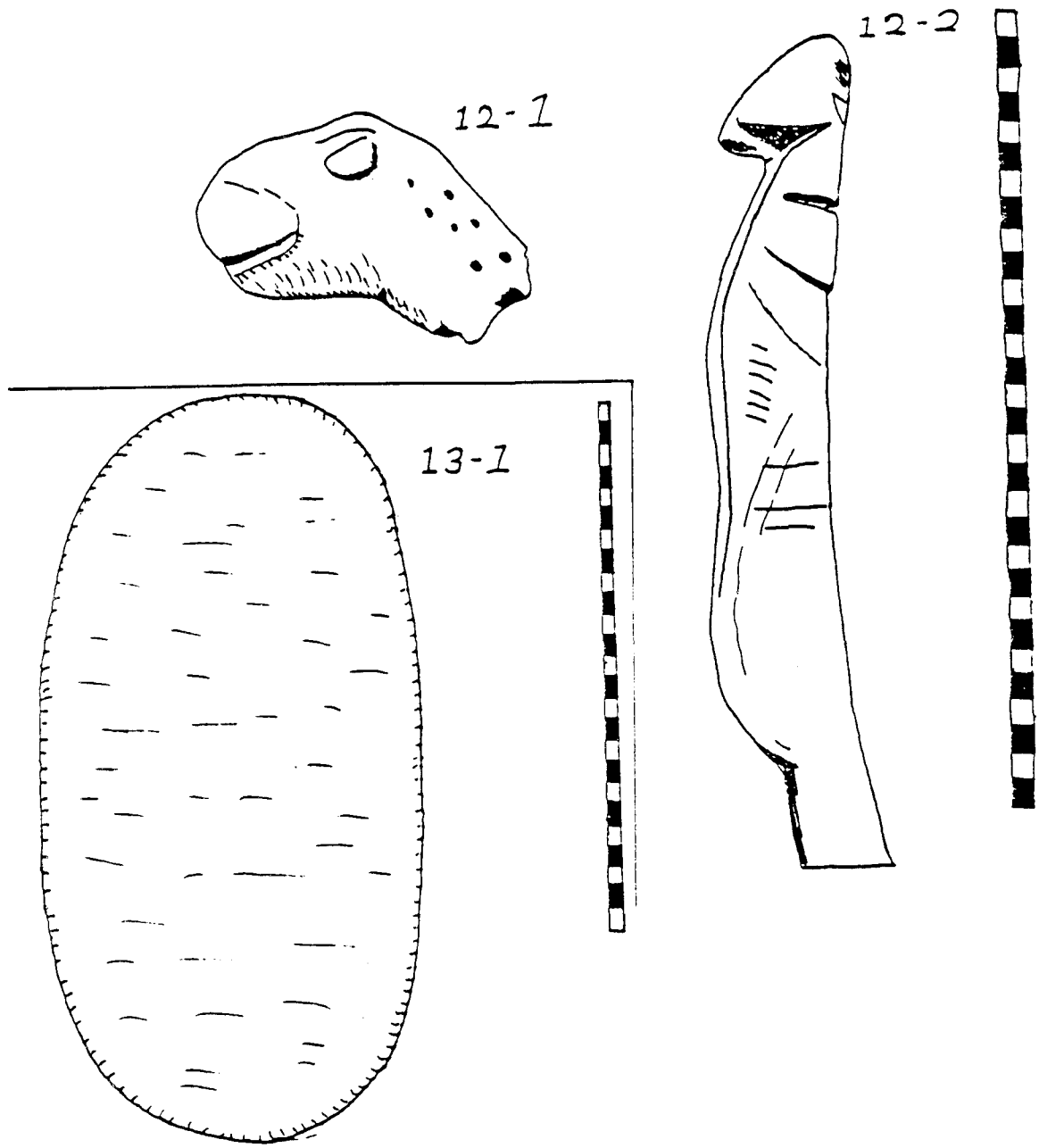

Figure 8. Bone artifact types 12 to 13.

13-0. Bone Plates or Platters (Stubbs, 1973). See Figure 8.

13-1. Whale bone object 35 by 18 cm and 2 cm thick. One side has been worked smooth. Tool marks may be present on the worked side. May have been used as a cutting board or as a plate. Type specimen found in Stubbs (1973).

14-0. Antler digging stick handle (Minor, 1983). See Figure 9.

14-1. A curved section of antler up to 30 cm long. A square hole approximately 4 by 2 cm carved into the object near the center, where the digging digging stick would be inserted into the handle. Type specimen found in Minor (1983).

15-0. Unknown Decorative Items. See Figure 9.

15-1. An antler pendant 10 cm long with the top section 4 cm wide and the bottom 2.5 cm wide. The object is flat and of uniform thickness (0.47 cm). It has five perforations with three on the upper portion and two in the center. The object is also decorated with lines and circles. It is possible that this is something traded from the north. Type specimen found in Leatherman and Krieger (1940).

15-2. A large artifact carved from antler. The object is 15 cm in length and 37.5 cm at its widest. Decorated with incised lines and triangles. Possibly a pendant. Type specimen found in Ross and Snyder (1986).

15-3. Carved whale bone artifact. It is a 32 by 23 by 1.5 cm oval shape with eight triangular holes carved into the center area. The edge has 53 scallops carved around the rim. Type specimen found in Minor et al. (1987).

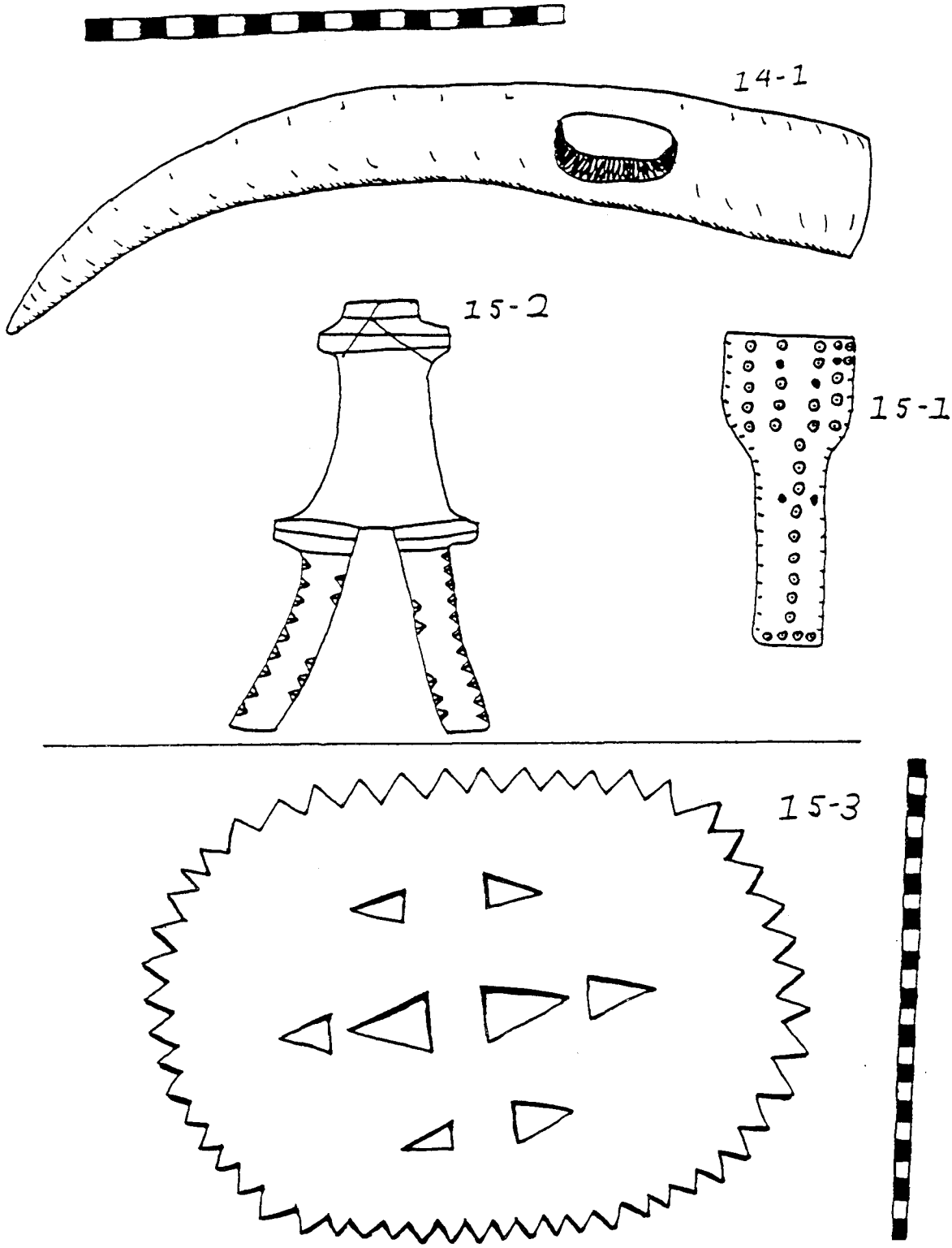

Figure 9. Bone artifact types 14 to 15.

Pragmatic Artifacts

16-0. Bone Needles. Pointed objects of bone with a hole on the other end (Roll, 1974). See Figure 10.

16-1. Bone needles. Splinters of bone, worked to a point and with a hole at the other end. Type specimen found in Newman (1959).

16-2. Bird bone needle. A hollow bird bone beveled at one end to form the point, the eye was made by notching the shaft near the opposite end. Type specimen found in Newman (1959).

17-0. Wedges, or chisels. Used to split and work wood (Drucker, 1943; Roll, 1974). See Figure 10.

17-1. Metapodial wedges. Manufactured from metapodials of small animals. Distal end bifacially ground to produce a square-bitted wedge shape. Type specimen found in Newman (1959).

17-2. Antler wedge. Portion of an antler with a bifacially beveled bit. Poll end usually battered. Type specimen found in Roll (1974).

17-3. Bone wedge. Portion of mammal bone with one end beveled to form a bit. Type specimen found in Minor and Musil (1987).

18-0. Awls. Sharp tipped objects of bone with rounded, squared, or broken butt. Other potential uses are as large fishhook barbs, projectile points, etc (Roll, 1974). See Figure 10.

18-1. Split bone awls. Bone splinters which have been sharpened on one end. Type specimen in Minor and Musil (1987).

19-0. Whalebone Club (Berreman, 1944). See Figure 11.

19-1. A section of whale bone flattened on one side. Type specimen in Berreman (1944).

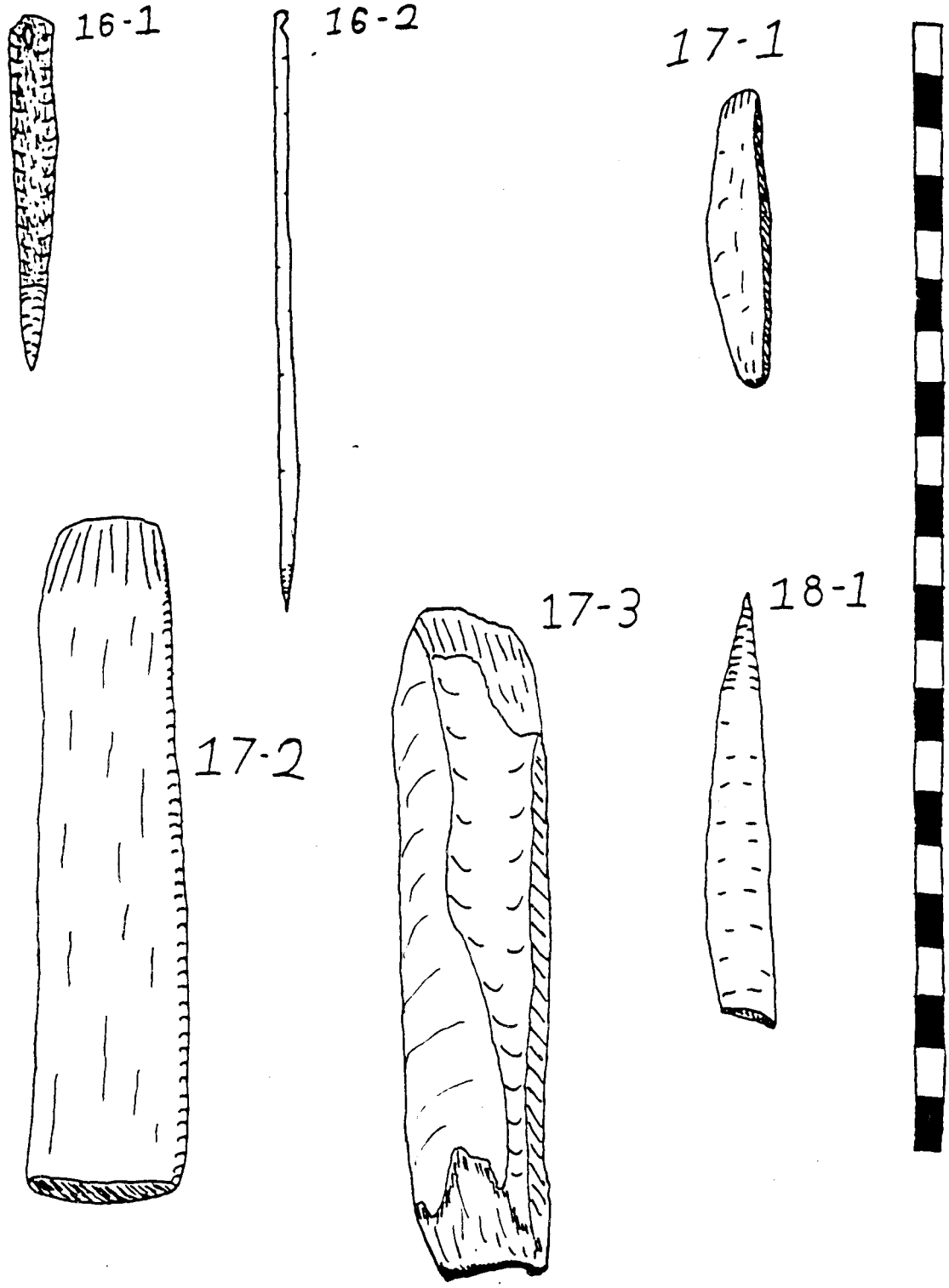

Figure 10. Bone artifact types 16 to 18.

20-0. Bird Bone Tube (Roll, 1974). See Figure 11.

20-1. Bird bone tube is a section of a main wing shaft. The entire bone has been smoothed. Type specimen in Roll (1974).

21-0. Bird Bone Whistle (Roll, 1974). See Figure 11.

21-1. Bird bone whistles are sections of bird bone with a shallow hole incised just deep enough to penetrate the central cavity. Type specimen in Hall et. al (1990).

22-0. Bone Bead (Roll, 1974). See Figure 11.

22-1. Bird bone bead is a small section of bird bone. These are 3 to 4 cm in length, sometimes decorated, and have been classed as gaming bones (Berreman, 1944). Type specimen in Berreman (1944).

23-0. Antler flakers (Drucker, 1943). See Figure 11.

23-1. Antler flakers are sections of antler tine, usually hacked or whittled off, which the point end has been used to remove flakes in the manufacture of a stone tool. Type specimen found in Barner (1982).

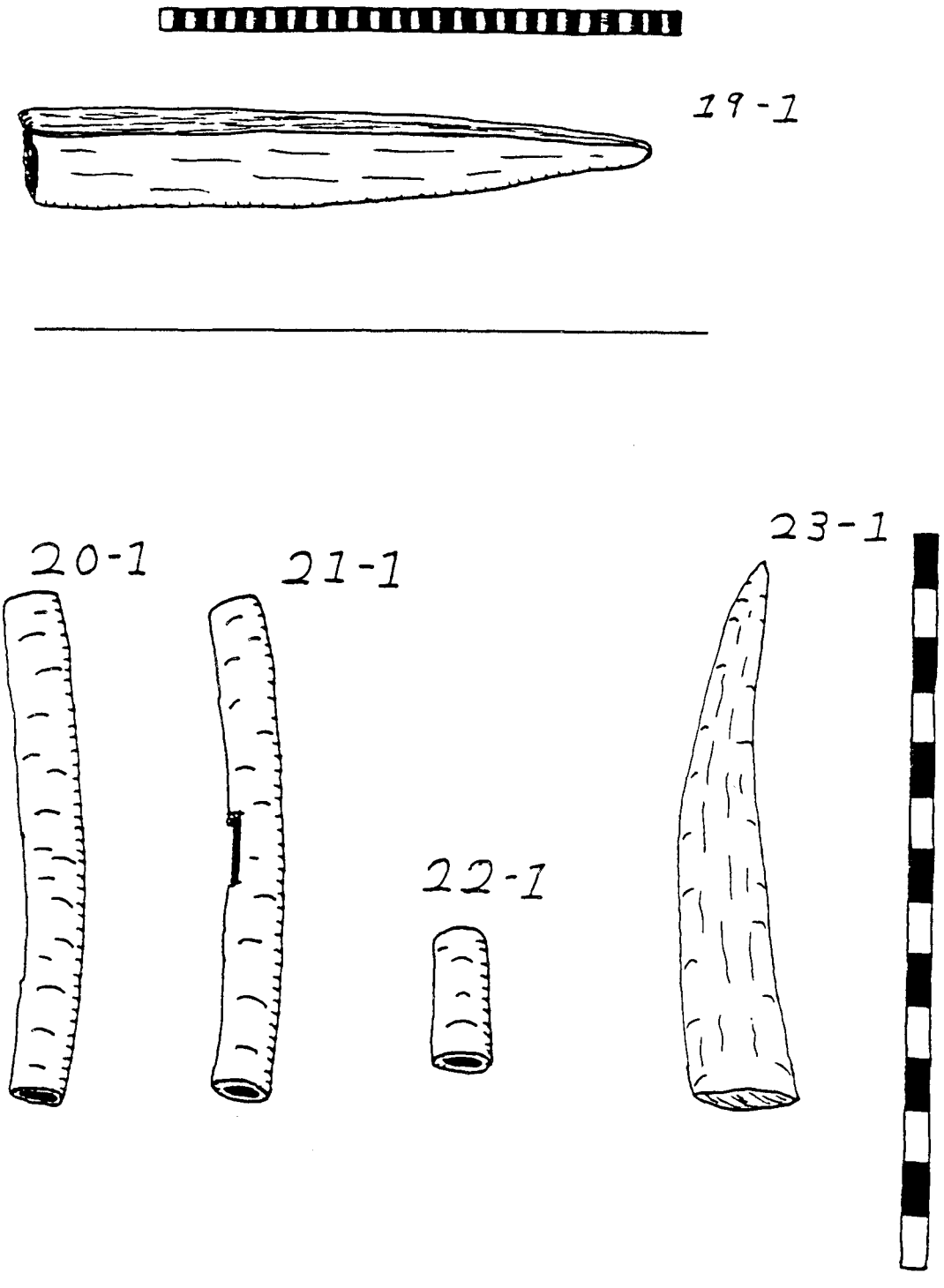

Figure 11. Bone artifact types 19 to 23.

Chapter 5

ENVIRONMENTAL REGIONS AND THE ASSOCIATED ARTIFACT TYPES

The climate on the Oregon coast is homogeneous, but the landforms vary from sand dunes to basaltic headlands. The various landforms give the Oregon coast a wide variety of microclimates and of resources for the native people to draw upon. The different resources available in each landform region may be reflected in the bone artifacts produced on the Oregon coast. This hypothesis will be tested by examining the distribution of artifact types from sites along the Oregon coast. This chapter will discuss sites excavated in each landform region (Figure 12) along the Oregon coast and the artifact types recovered from these sites.

Region 1

Region 1 (Figure 12) is the Clatsop Plains which extend from the mouth of the Columbia River to Tillamook Head. This region is mostly covered with sand dunes (Cooper, 1958). This portion of the Oregon coast is the region occupied by the Chinook-speaking Clatsop (Minor, 1983). The Clatsop lived along the Columbia River in the summer but moved to sites along the coast in the winter, even as far south as Seaside. This winter movement was likely done to avoid the cold winter winds that frequent the Columbia Gorge.

Eddy point (35CLT33), and Ivy Station (35CLT34) are two estuarine sites along the Columbia River. These sites were included because estuaries are part of the ocean zone. Estuaries are areas where fresh water and sea water mix forming a unique habitat that is rich in resources. The estuarine areas often were exploited by coastal people.

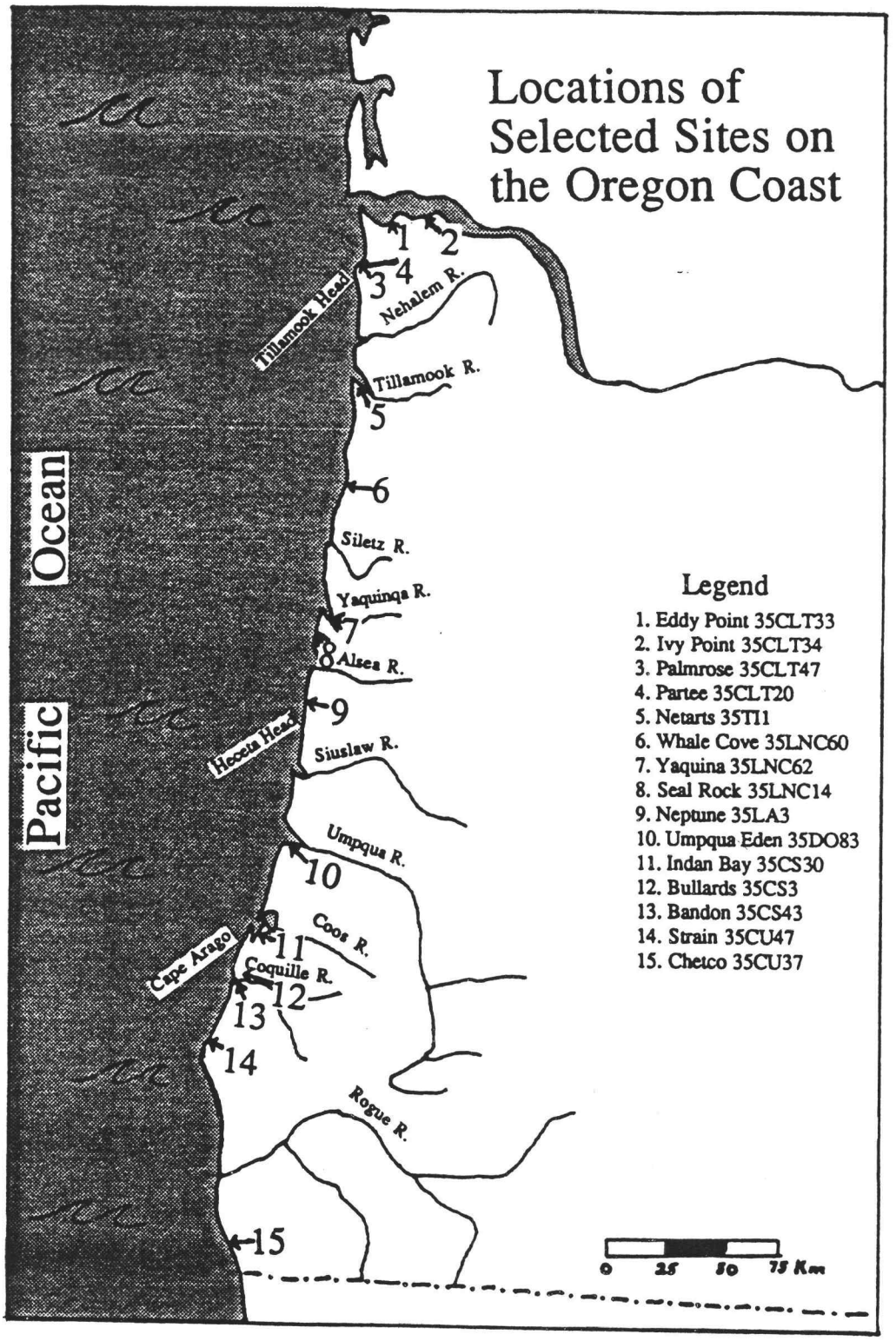

Figure 12. Location of sites used to formulate the typology.

Eddy point is a projection of land on the south side of the Columbia River about 5 km east of Astoria. This site is near Big Creek which is one of the larger salmon spawning streams along this section of the Columbia River (Minor, 1983). The excavation occurred in five brief periods in 1978 and 1979 and the site was dated to 3130 B.P. (Minor, 1983).

Eddy point contained five composite toggling harpoon heads (2-1, as per chapter 4), in the 930 B.P., 1500 B.P. and 3130 B.P. strata. There were also bilateral harpoon heads (4-1) in the 3130 B.P. stratum and a unilateral harpoon head (3-1) in the 1500 B.P. stratum. Several points (1-4) were found in the 930 B.P. stratum, bipoints (1-1) were found in the 930 B.P. and 3130 B.P. strata. Pragmatic items found at Eddy point were split bone awls (18-1), and bone wedges (17-3) were in the 930, 1500, and 3130 B.P. There was also a bird bone bead (22-1) found in the 1500 B.P. strata.

Ivy Station is located on the south bank of the Columbia River, 2 km west of Eddy Point. This site was excavated in 1978 (Minor, 1983) and was dated to 1400 B.P. The site contained 6 bipoints (1-1), composite harpoon valves (2-2), a digging stick handle (14-1), and a zoomorphic figure (not described in Minor, 1983). Pragmatic artifacts include split bone awls (18-1), and bone wedges (17-3).

The Palmrose (35CLT47) and ParTee sites (35CLT20) were excavated by George Phebus and Robert Drucker (1977). Although the report does not give descriptions of most of the artifacts, there were enough descriptions to be able to identify some of the artifact types found in these sites.

The Palmrose site, located in a swampy area near the junction of Shangri-la Creek and Highway 26-101, was dated to between 1640 and 3840 B.P. (Lyman and Ross, 1988; Phebus and Drucker, 1979). This site was located on an old beach terrace (Phebus and Drucker, 1979). Unfortunately, the site report lacked

stratigraphic information, which does not allow the artifacts to be placed in the correct temporal context. This means that only a rough temporal range can be postulated for these artifacts. What is known is that the site contained 356 bipoints (1-1), 102 type I composite harpoon valves (2-1), 27 unilaterally barbed harpoons (3-1), and 8 bilateral asymmetrically barbed harpoons (4-2), and one bilateral harpoon with a slotted tip to receive a lithic, shell, or bone point (4-3), and some antler digging stick handles (14-1). Pragmatic artifacts included antler wedges (17-2), metapodial wedges (17-1), bone awls (18-1), bird bone needles (16-2), antler flakers (23-1), and a bird bone whistle (21-1).

The ParTee site was dated between 950 and 3140 B.P. (Lyman and Ross, 1988; Phebus and Drucker, 1979). This site was located on the grounds of the Seaside Golf Course just west of Highway 26-101 (Phebus and Drucker, 1979). Again stratigraphic data were not given. The site contained a long, multiply barbed, unilateral harpoon with a line eye (3-1). There were also 55 bilaterally barbed harpoons (4-1), some composite toggling harpoon valves (2-1), fish hooks (6-4), some bipoints (1-1) described as fish hook barbs, and some antler digging stick handles (14-1). Pragmatic artifacts at the ParTee site included Antler wedges (17-2), Metipodial wedges (17-1), bird bone needles (16-2), awls (18-1), and bird bone whistles (21-1).

Region 1 artifacts included bipoints (1-1) and unipoints (1-4), composite toggling harpoon valves (2-1 and 2-2), unilaterally barbed harpoon heads (3-1), bilaterally barbed harpoon heads (4-1, 4-2, and 4-3), fishhooks (6-4), and an antler digging stick handle (14-1). Pragmatic artifacts in this region included bird bone needles (16-2), wedges (17-1, 17-2, 17-3), awls (18-1), bird bone whistles (21-1), bird bone bead (22-1), and antler flakers (23-1). These artifact types range from 1000 years B.P. to 3000 years B.P. (see Appendix), suggesting that hunting, fishing, and

root gathering occurred in region 1.

Region 2

Region 2 ranges from Tillamook Head to Heceta Head. This is an area of broken cliffs, and headlands broken by marine terraces. This area was where the Tillamook, Siletz, Yaquina, Alsea, and part of the Siuslaw groups were living. These groups had seasonal rounds that put them on the coast in the spring, fall, and winter and inland during the summer months.

Netarts sand spit sites 35TI1 and TI1a were excavated in 1956 and 1957. The excavation was reported by Thomas Newman (1959) and has been dated at 150-550 B.P. This is an area seven miles west of Tillamook located on a six-mile-long sand spit in Netarts Bay. The sites contained a series of house pits in which were found bipoints (1-1), two different bone blades (both 8-1 and 8-2), a composite toggling harpoon valve type I (2-1), four fragmentary digging stick handles (14-1), and had two carved bone figures (12-1) and another carved object (12-2). Pragmatic artifacts included metapodial wedges 17-1), bone wedges (17-3), antler wedges (17-2), split bone awls (18-1), mammal bone needles (16-1), and bird bone needles (16-2).

Whale Cove site (35LNC60) located north of Newport on a small knoll overlooking Whale Cove was excavated by Lee Lyman in 1985 (Bennett, 1988). This site was divided into three major strata. These strata were WCIII dated at 330 B.P., WCII dated at 610 B.P., WCI dated between 2830 and 3010 B.P., and a fourth category was WCIV which was for objects of unknown provenance. WCI contained a bone spoon (7-1), a bracelet/headband (11-1), four fish lures (6-1), and four bipoints (1-1). Pragmatic artifacts included awls (18-1) in the 3000 B.P. strata, bird bone needles (16-1) in each of the strata (330, 610, and 3000 B.P.), antler

wedges (17-2) in the 3000 and 600 B.P. strata, bone wedges (17-3) in the 3000 and 330 B.P. strata, bird bone whistle (21-1) in the 3000 B.P. strata, bird bone tube (20-1) in the 3000 B.P. strata, and a flaker (23-1) in the 330 B.P. strata.

The Yaquina Head site (35LNC62) is located 5 km north of Newport (Minor et al., 1987). This site was excavated by Heritage Research Associates in 1986. The site was dated between 5000 and 3000 B.P. The site contained a carved whale bone object dated at 3400 B.P. (Minor and Musil, 1987). This artifact was 32 by 23 by 1.5 cm and had eight triangular designs carved through it and 53 scalloped points along the rim (15-3). Pragmatic artifacts from this site include split bone awls (18-1), bird bone needle (16-2), and bone wedges (17-3).

The Seal Rock site (35LNC14) is located 15 km south of Newport and was reported by Linda Clark (1988). This site was excavated in the summers of 1972 and 1974 under the direction of Dr. Richard Ross of Oregon State University. The Seal Rock site was dated at 375-160 B.P. This site contained one bipoint (1-1), eight unipoints (1-4), one triangular bone point (5-3), two type I composite toggling harpoon valves of salmon size (2-1), eight type II composite harpoon valves of piniped size (2-2), one composite harpoon valve without a groove or step for arming (2-3), three fish hooks (6-2), one composite fish hook (6-5), and one carved pendant (9-3). Pragmatic artifacts at the Seal Rock site included antler wedges (17-2), bone wedges (17-3), split bone awls (18-1), antler flakers (23-1), and a bird bone whistle (21-1).

The Neptune site (35LA3) was excavated under the direction of Dr. Richard Ross in 1973 (Barner, 1982). The Neptune site is located between Gwynn and Cummins Creeks south of Yachats and was dated at 320 B.P. This site contained three bipoints (1-1), a composite harpoon valve (2-1), and a triangular bone point (5-3). Pragmatic artifacts included antler flakers (23-1), antler wedges (17-2), and

split bone awls (18-1).

Region 2 contained bipoints (1-1) and unipoints (1-4), composite toggling harpoon spurs (2-1, 2-2, and 2-3), a triangular bone point (5-3), fishhooks (6-1, 6-2, 6-5), a bone spoon (7-1), bone knives (8-1, 8-2), a headscratcher/pendant (9-3), a headband spreader/bracelet (11-1), zoomorphic figures (12-1, 12-2), and a carved whale bone artifact (15-3). Pragmatic artifacts included needles (16-1, 16-2), wedges (17-1, 17-2, 17-3), awls (18-1), bird bone tubes (20-1), bird bone whistles (21-1), and antler flakers (23-1). Region 2 dates range from approximately 3000 B.P. to approximately 500 B.P. with a gap in between 2000 to 1000 years B.P. (see Appendix).

Region 3

Region 3, from Heceta Head to Cape Arago, includes the Lower Umpqua and the Coos groups. This area is mainly low land and includes the Coos dune sheet.

The Indian Bay site (35CS30) was excavated by Ron Stubbs in the early 1970's (Stubbs, 1973). This site is located on the South Slough near Barview. The site was dated at 200-300 B.P. The Indian Bay site contained an object that could have been a unilateral harpoon (3-0), a triangular point (5-3), bipoints (1-1), fish hooks (6-3), and a bone platter (13-1). Pragmatic artifacts from Indian Bay included antler wedges (17-2), and split bone awls (18-1).

Umpqua/Eden (35DO83) was excavated over a three-year period from 1978 to 1980. This site was dated with areas from 3000 B.P. to 100 B.P. (Ross and Snyder, 1986). This site contained harpoons (3-2) in the 3000 B.P. strata (Ross and Snyder, 1986), and an antler artifact (15-2) in the 100 B.P. strata. Pragmatic artifacts recovered were wedges (17-2). Unfortunately, due to late prehistoric

mixing it is difficult to determine the original provenance for many artifacts.

Region 3 contained bipoints (1-1), unilaterally barbed harpoon heads (3-0, 3-2), triangular bone points (5-3), fishhooks (6-3), a bone plate (13-1), and a large artifact of carved antler (15-2). Pragmatic artifacts were antler wedges (17-2), and awls (18-1). Region 3 covers the time period of 3000 to 100 years B.P. (see Appendix).

Region 4

Region 4 includes the Coquille, Tututni, Shasta Costa, Chetco, and Tolowa groups. This is the Klamath mountain area where these ancient mountains break near the coast.

The Bullards site (35CS3) was excavated by Kenneth Leatherman and Alex Krieger in 1938 and 1939 with the help of University of Oregon students. This site is located north of Bandon on the banks of the Coquille River. The Bullards site contained three house pits and three burials (Leatherman and Kreiger, 1940). This site was dated by the artifact assemblage and was placed in the mid 19th century (Draper, 1981). The site contained one bipoint (1-1), four blanket pins (1-3), five unipoints (1-4), three type I composite harpoon valves (2-1), three unipoints with expanding base (1-5), one gig, a thin bone bipoint (1-1) and one antler pendant (15-1). The antler pendant was a flat artifact of uniform thickness with five perforations, three on top and two in the center, and is decorated with lines and circles. The design seems to be from the north. The pragmatic artifacts found at the Bullards site were antler wedges (17-2), antler flakers (23-1), and bird bone whistles (21-1).

The Bandon site (35CS43) was excavated in 1978, 1986, and 1988. This site is located in the old town section of Bandon. The 1978 excavation has not been

fully analyzed. The 1986 excavation uncovered a triangular bone projectile point (5-2), unipoints (1-3), a decorated piniped canine (10-1), and an unbarbed harpoon point (1-2).

The 1988 excavation was dated at 1350 and 1600 B.P. This excavation turned up a bone projectile point (5-1), a bone pendant/ headscratcher (9-1), and an antler spoon (7-2). Pragmatic artifacts included awls (18-2), and bird bone whistles (21-1), but these artifacts do not have an accurate date.

The Strain site (35CU47) was excavated by Newman in 1958 (Newman, 1959). This site was located seventeen miles north of Port Orford. The Strain site was dated to about the 1850's (Draper, 1988). This site contained a bipoint (1-1) which was suggested to be a nosepin (Newman, 1959), also a unilateral harpoon head (3-3), and a triangular bone point (5-4). Pragmatic artifacts include awls (18-1), and bone beads (22-1).

The Chetco site (35CU37) is located at the mouth of Lone Ranch Creek six miles north of Brookings. This site was excavated in 1935 by Joel Berreman (1944) and has been dated to between 100 and 500 B.P. This site contained bipoints (1-1), fish hooks (6-3), unilateral harpoons (3-3), a composite harpoon valve (2-1), composite fish hooks (6-5), headscratchers (9-2), tooth pendants (10-2), and a fragment of a antler spoon (7-2). Pragmatic artifacts include awls (18-1), needles (16-1), bird bone beads (22-1), whalebone club (19-1), and antler wedges (17-2).

Region 4 contained bipoints (1-1), blanket pins (1-3), unipoints (1-4, 1-5), composite harpoon valves (2-1), unilaterally barbed harpoon heads (3-3), bone projectile points (5-1, 5-2, 5-4), fishhooks (6-3, 6-5), antler spoons (7-2), headscratcher/pendants (9-1, 9-2), decorated teeth (10-1, 10-2), and an antler pendant (15-1). Pragmatic artifacts include bone needles (16-1), wedges (17-2), awls (18-1), a whalebone club (19-1), bird bone whistle (21-1), beads (22-1), and antler

flakers (23-1). Region 4 covers the time range between 100 and 1500 years B.P. (see Appendix).

The above sites were used to formulate the typology listed in chapter 4. Examination of the distribution of the artifact types (Table 3) does suggest that there are some artifacts found only in certain landform regions of the Oregon coast. It appears from Table 3 that bilaterally barbed harpoon heads (4-0) were not used south of region 1. The obvious bone projectile points (5-1, 5-2, and 5-4) do not appear north of region 4, while the triangular bone points (5-3), which may be pendant preforms, appear in regions 2 and 3. Zoomorphic figures (8-0) appear only in region 1. Spoons are divided between regions 2 and 4. Region 2 has the bone spoon (7-1) and region 4 has the antler spoons (7-2). This distribution will be examined further. Table 4 shows the chronological distribution of the artifact types.

Table 3. Types found at each Oregon coast site examined.

		Region 1					Region 2				Region 3			Region 4		
		CLT 33	CLT 34	CLT 47	CLT 20	TI 1	LNC 60	LNC 62	LNC 14	LA 3	CS 30	DO 83	CS 3	CS 43	CU 47	CU 37
Bipoints/Unipoints	1-0															
	1-1	x	x	x	x	x	x		x	x	x		x		x	x
	1-2													x		
	1-3												x	x		
	1-4	x							x				x			
	1-5												x			
Composite harpoon	2-0															
	2-1	x		x	x	x			x	x			x			x
	2-2		x						x							
	2-3								x							
Unilateral harpoons	3-0															
	3-1	x		x	x						?					
	3-2											x				
	3-3														x	x
Bilateral harpoons	4-0															
	4-1	x			x											
	4-2			x												
	4-3			x												
Projectile points	5-0															
	5-1													x		
	5-2													x		
	5-3								x	x	x					
	5-4														x	
Fish hooks	6-0															
	6-1						x									
	6-2								x							
	6-3										x					x
	6-4				x											
	6-5								x							x
Spoons	7-0															
	7-1						x									
	7-2													x		x
Knives	8-0															
	8-1					x										
	8-2					x										
Headscratchers/Pendants	9-0															
	9-1													x		
	9-2															x
	9-3								x							
Decorated teeth	10-0															
	10-1													x		
	10-2															x
Headbands/Bracelets	11-0															
	11-1						x									
Zoomorphic figures	12-0															
	12-1					x										
	12-2					x										
Plates/Platters	13-0															
	13-1										x					
Digging stick handles	14-0															
	14-1		x	x	x	x										
Decorative items	15-0															
	15-1												x			
	15-2											x				
	15-3							x								

Table 3. Continued

		Region 1					Region 2				Region 3			Region 4		
		CLT 33	CLT 34	CLT 47	CLT 20	TI 1	LNC 60	LNC 62	LNC 14	LA 3	CS 30	DO 83	CS 3	CS 43	CU 47	CU 37
Needles	16-0															
	16-1					x	x									x
	16-2			x	x	x		x								
Wedges/Chisels	17-0															
	17-1			x	x	x										
	17-2			x	x	x	x		x	x	x	x	x			x
	17-3	x	x			x	x	x	x							
Awls	18-0															
	18-1	x	x	x	x	x	x	x	x	x	x			x	x	x
Clubs	19-0															
	19-1															x
Tubes	20-0															
	20-1						x									
Whistles	21-0															
	21-1			x	x		x		x				x	x		
Beads	22-0															
	22-1	x													x	x
Flakers	23-0															
	23-1			x			x		x	x			x			

Table 4. Chronological distribution of artifact types along the Oregon Coast.

		Years B.P.					
		100	500	1000	1500	2000	3000
Bipoints/Unipoints	1-0						
	1-1	x	x		x	x	x
	1-2	?	?				
	1-3	x	?				
	1-4	x	x	x			
	1-5	x					
Composite harpoon	2-0						
	2-1	x	x	x	x	x	x
	2-2		x		x		
	2-3		x				
Unilateral harpoons	3-0						
	3-1				x	x	x
	3-2	x	x				
	3-3						
Bilateral harpoons	4-0						
	4-1						x
	4-2				x	x	x
	4-3				x	x	x
Projectile points	5-0						
	5-1				x		
	5-2	?	?				
	5-3		x				
	5-4	x					
Fish hooks	6-0						
	6-1					x	x
	6-2		x				
	6-3		x				
	6-4			x	x	x	x
	6-5	x	x				
Spoons	7-0						
	7-1					x	x
	7-2	x	x	?			
Knives	8-0						
	8-1			x			
	8-2			x			
Headscratchers/Pendants	9-0						
	9-1				x		
	9-2	x	x				
	9-3		x				
Decorated teeth	10-0						
	10-1	?	?				
	10-2	x	x				
Headbands/Bracelets	11-0						
	11-1					x	x
Zoomorphic figures	12-0						
	12-1		x				
	12-2		x				
Plates/Platters	13-0						
	13-1		x				
Digging stick handles	14-0						
	14-1		x		x	x	x
Decorative items	15-0						
	15-1	x					
	15-2	?	?				
	15-3						x
Needles	16-0						
	16-1	x	x				x
	16-2	x	x	x	x	x	x

Table 4. Continued

		Years B.P.					
		100	500	1000	1500	2000	3000
Wedges/Chisels	17-0						
	17-1	x	x	x	x	x	x
	17-2	x	x	x	x	x	x
	17-3	x	x	x	x	x	x
Awls	18-0						
	18-1	x	x	x	x	x	x
Clubs	19-0						
	19-1	x					
Tubes	20-0						
	20-1						x
Whistles	21-0						
	21-1	x	x	x	x	x	x
Beads	22-0						
	22-1	x			x		
Flakers	23-0						
	23-1	x	x		x	x	x

CHAPTER 6

CONCLUSIONS

The purpose of this paper was to set up a non-lithic artifact typology that can be used in conjunction with stone tool typologies. Those typologies can be used to answer questions about the Oregon coast. Although not enough information to make any definite statements about bone artifact type distribution on the Oregon coast is available yet, there is enough information to point out some patterns and to suggest some areas for future research (Table 3).

It has been stated that by 1500 B.P. the composite toggling harpoon had replaced the bilaterally and unilaterally barbed harpoon (Minor, 1983). Evidence suggests that this may not be true for the entire Oregon coast. The bilaterally and unilaterally barbed harpoon appears in the northern section of the Oregon coast at Eddy Point at 3130 B.P and Palmrose and ParTee also have the bilaterally and unilaterally barbed harpoon. There are no bilaterally or unilaterally barbed harpoons in the sites from Region 2. Region 3 has unilaterally barbed harpoons from Indian Bay and Umpqua/Eden, with dates at Indian Bay from 200 to 300 B.P. The dates for the unilaterally barbed harpoon head from Umpqua/Eden have not yet been determined. Region 4 has unilaterally barbed harpoons from Bandon at 1350 B.P. (Hall et al., 1990; Lindsay, 1990) and from the Lone Ranch site dated between 100 and 500 B.P. Table 4 shows that the unilateral harpoon head is in evidence for the last 3000 years on the Oregon coast. This would suggest that the unilaterally barbed harpoon may have been common throughout the Oregon coast, but the bilaterally barbed harpoon does not seem to be common anywhere except in Region 1 of the Oregon coast. It may be that bilaterally barbed harpoons were introduced from the northern Northwest Coast and had the most utility in the Clatsop dune area of Oregon, but did not spread southward.

Another pattern that seems to be apparent is the movement of the composite toggling harpoon type 1-1 southward down the Oregon coast. The earliest appearance of the composite toggling harpoon is in region 1 between 2000 and 1500 B.P. (see Figure 13). These sites include Eddy Point, Ivy Station, and the Seaside sites of Palmrose and ParTee. The composite toggling harpoon appears in region 2 in sites 500 B.P. and younger. These sites include Netarts, Seal Rock, and Neptune. The composite toggling harpoon appears in region 4 at 100 B.P at Bullards. The composite harpoon valve also appears at two other sites in region 4; 250 to 500 B.P. at Bandon (35CS5) and 500 to 1000 at Warden rockshelter (35CS44)

	Years B.P.					
Region	100	500	1000	1500	2000	3000
1			X	X	X	X
2		X				
3						
4	X	X				

Figure 13. Composite toggling harpoon valves by region and time.

(Draper, 1988). The last date of 500 to 1000 B.P. is from the artifact assemblage. This would suggest that the composite toggling harpoon was developed on the northern Northwest Coast and the technology was gradually brought down the coast to reach region 4 by 500 B.P. This hypothesis can best be tested when a site in the southern portion of the Oregon coast is found that has a time depth from early periods (3000 B.P. or earlier) to historic times. If this site has composite toggling harpoon valves in the late period and none in the early period, this will add strength to the hypothesis. If the site has composite toggling harpoon valves in the earlier periods, 1500 B.P. or earlier, this will invalidate the hypothesis.

Only two sites on the Oregon coast have the type 2-2 composite harpoon

valve. This is the type with a constriction on the body and an expanding tip. Type 2-2 is found only at Seal Rock (500 B.P.) and at Ivy Point (1500 B.P.). This type is also found in Washington at the Minard site (Roll, 1974) in levels that dated between 100 and 800 B.P. It could be hypothesized that this type of composite harpoon valve came to the Oregon coast at a later time than type 2-1 or that type 2-2 was not as popular as the 2-1 type.

A third pattern is that of headscratchers (9-1, 9-2), which seem to appear only on the southern half of the Oregon coast. The sites with artifacts that have been interpreted as headscratchers are Lone Ranch and Bandon. This is consistent with Barnett's (1937) cultural element distribution, which shows the headscratcher to be common only on the southern half of the Oregon coast, below the Alsea. Barnett shows only the Alsea, Siuslaw, Coos, Galice Creek, and the Tolowa as using bone headscratchers (Barnett, 1937:180), although in the case of the Alsea, Barnett's information was unsure. The headscratcher may be an item that was introduced from the California area, or it may be that headscratchers have not yet been recognized in northern Oregon coast sites. Another possible hypothesis is that headscratchers were introduced when the Athapascans entered the region. The headscratcher from the Bandon site (35CS43) is dated at 1350 B.P., this may be the older type 9-1 that evolved into the type 9-2. The only other site that has anything similar is Seal Rock, and that artifact (9-3) appears to be more of a pendant than a headscratcher (Figure 7).

Another pattern is the chronological pattern of the types; 6-0 (fish hooks), 7-0 (spoons), 16-0 (needles), 17-0 (wedges and chisels), 18-0 (awls), 21-0 (whistles), 23-0 (antler flakers). These artifact types cover the complete time span from 3000 B.P. to 100 B.P. Types 16-0, 17-0, 18-0, 21-0, 23-0 are all pragmatic artifacts. This would be evidence that the pragmatic artifacts have remained useful and mostly

unchanging for the last 3000 years. These patterns are not definite, but do show areas for future research and demonstrate the utility of typologies. An investigator can define the attributes that are important to the study thereby giving a standard definition for artifacts so that patterns can be recognized when sites are compared. When an investigator defines the criteria used to develop a typology, then other investigators can determine whether or not they agree with those criteria and do their own comparisons.

The coast of Oregon has a variety of natural resources that were used by native people. These resources influenced the types of artifacts that people manufactured. The type of artifacts that were manufactured depended upon the materials that were available, the intentions of the manufacturer, the skill and methods used in the manufacture, and the final purpose or the function of the artifact. Archaeologists have the end products of the manufacturing process, the artifacts, and usually only fragments of them. From these artifacts archaeologists attempt to reconstruct the culture of the people who made the artifacts.

Archaeologists often use statistical methods to formulate typologies, but it is still the skill and knowledge of the archaeologist that determines the typology. Archaeologists must know when to apply statistics and when to rely on their own recognition of patterns. Archaeologists must be able to determine the variables that are important in separating the types. In this instance, the various types were all unique artifacts and each type was well defined within the chosen criteria without the use of statistics. The criteria; the material the artifact was made on, the determined purpose of the artifact, and major differences in attributes such as shape, decoration, or size, were broad enough to include minor variations in the types.

Archaeologists must remember that the end product of the typology is not

the culture, it is only an ordering of artifacts which are a product of the culture. Typologies can give us insights into a culture through its artifacts and show us cultural change over time. Typologies are not the be-all and end-all of archaeology, but only the beginning of the process of reconstructing the prehistoric cultures we study. The preliminary typology presented in this paper has been made to help Oregon coast archaeologists consistently compare sites along the Oregon coast. To make this typology more useful, other sites with bone artifacts need to be examined and their bone artifacts compared with and, if needed, added to this typology.

It may also be noted that in many instances the site reports often did not report enough about an artifact to enable a judgment to be made as to its possible type. In some instances, artifacts could not be included because there was no adequate description or picture of the artifact in the report. The zoomorphic figure from Ivy Station (Minor, 1983) was not included in the typology for this reason. All site reports should include descriptions, photographs, or drawings of all artifacts. All site reports should list and describe all artifacts and refer to a type specimen so that other investigators can compare the reported site with others on the Pacific coast.

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APPENDIX

Appendix
Artifact types by Region and Time Period

TYPE 1-1

Region	100	500	1000	1500	2000	3000
1				XXXX	XXXX	XXXX
2		XXXX			XXXX	XXXX
3		XXXX				
4	XXXX	XXXX				

TYPE 1-2

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4	?	?	?			

TYPE 1-3

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX	?	?			

TYPE 1-4

Region	100	500	1000	1500	2000	3000
1			XXXX			
2		XXXX				
3						
4	XXXX					

TYPE 1-5

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX					

TYPE 2-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2		XXXX				
3						
4	XXXX					

TYPE 2-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1				XXXX		
2		XXXX				
3						
4						

TYPE 2-3

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 3-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1				XXXX	XXXX	XXXX
2						
3		?				
4						

TYPE 3-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						XXXX
4	XXXX	XXXX				

TYPE 3-3

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX					

TYPE 4-1

Region	100	500	1000	1500	2000	3000
1						XXXX
2						
3						
4						

TYPE 4-2

Region	100	500	1000	1500	2000	3000
1				XXXX	XXXX	XXXX
2						
3						
4						

TYPE 4-3

Region	100	500	1000	1500	2000	3000
1				XXXX	XXXX	XXXX
2						
3						
4						

TYPE 5-1

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4				XXXX		

TYPE 5-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	?	?	?			

TYPE 5-3

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2		XXXX				
3		XXXX				
4						

TYPE 5-4

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX					

TYPE 6-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2					XXXX	XXXX
3						
4						

TYPE 6-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 6-3

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3		XXXX				
4						

TYPE 6-4

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2						
3						
4						

TYPE 6-5

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX	XXXX				

TYPE 7-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2					XXXX	XXXX
3						
4						

TYPE 7-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX	XXXX	?			

TYPE 8-1

Region	100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 8-2

Region	100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 9-1

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4				XXXX		

TYPE 9-2

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX	XXXX				

TYPE 9-3

Region	100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 10-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	?	?	?			

TYPE 10-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX	XXXX				

TYPE 11-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2					XXXX	XXXX
3						
4						

TYPE 12-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 12-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

TYPE 13-1

Region	100	500	1000	1500	2000	3000
1						
2		XXXX				
3						
4						

Years B.P.

TYPE 14-1

Region	100	500	1000	1500	2000	3000
1				XXXX	XXXX	XXXX
2		XXXX				
3						
4						

Years B.P.

TYPE 15-1

Region	100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX					

Years B.P.

TYPE 15-2

Region	100	500	1000	1500	2000	3000
1						
2						
3	XXXX					
4						

Years B.P.

TYPE 15-3

Region	100	500	1000	1500	2000	3000
1						
2						XXXX
3						
4						

Years B.P.

TYPE 16-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2	XXXX	XXXX				XXXX
3						
4	XXXX					

TYPE 16-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2	XXXX	XXXX				XXXX
3						
4						

TYPE 17-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2	XXXX	XXXX				
3						
4						

TYPE 17-2

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2	XXXX	XXXX				XXXX
3		XXXX				
4	XXXX					

TYPE 17-3

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX		XXXX
2	XXXX	XXXX				XXXX
3						
4						

TYPE 18-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2	XXXX	XXXX				XXXX
3		XXXX				
4	XXXX					

TYPE 19-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						
3						
4	XXXX					

TYPE 20-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1						
2						XXXX
3						
4						

TYPE 21-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1			XXXX	XXXX	XXXX	XXXX
2		XXXX				XXXX
3						
4	XXXX					

TYPE 22-1

Region	Years B.P. 100	500	1000	1500	2000	3000
1				XXXX		
2						
3						
4	XXXX					

TYPE 23-1

Region	100	500	1000	1500	2000	3000
	Years B.P.					
1				XXXX	XXXX	XXXX
2		XXXX				
3						
4	XXXX					

SITE DATES

Region	100	500	1000	1500	2000	3000
	Years B.P.					
1			XXXX	XXXX	XXXX	XXXX
2		XXXX				XXXX
3	? XXXX		?			
4	XXXX	XXXX	?	XXXX		