

LOWER CHINOOK ETHNOBOTANY:

Native Plant use in a Subsistence Context

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TABLE OF CONTENTS

<u>Introduction</u>	Page 1
<u>Environmental Background</u>	Page 4
<u>Flora and Fauna</u>	Page 8
<u>Ethnohistoric Background</u>	Page 14
<u>Subsistence</u>	Page 17
<u>Plant Foods</u>	Page 20
Roots and Rhizomes	Page 20
Fruits	Page 25
Stems and Nuts	Page 28
<u>Conclusion</u>	Page 30

The Chinook Indians of the Columbia River estuary had a regional variant of the elaborate Northwest Coast culture. This lifestyle, found along the Pacific seaboard from southeastern Alaska to northern California, was characterized by a cultural complexity and population density more typically found among food producers. On the Northwest Coast, the rich ceremonial life, feasts, art, architecture, settled villages and social and political elaboration were based on an extremely productive environment. The resources of the ocean, the forest, rivers and estuaries formed the foundation for their entire way of life. The abilities of the native inhabitants to recognize, collect, preserve and share a wide variety of animal and plant foods made possible (and in some cases necessary) the distinctive way of life of these sedentary hunter-gatherers.

The highest elaboration and cultural complexity within the Northwest Coast culture area was among those northern groups, such as the Tlingit, Kwakiutl, Haida and Nootka, who occupied the coastal areas and islands of British Columbia and Southeastern Alaska. To the south, however, these distinctive traits gradually decreased. While the Chinook clearly shared the generalized Northwest Coast way of life, their beliefs and behaviors were also strongly influenced by contacts with their inland neighbors from the Columbia Plateau and the Great Basin

(Drucker 1955). Thus, the Chinookan culture was a distinctive entity among these groups sharing inland features with the traditional coastal economy and lifestyle.

The territory occupied by Chinookan-speakers at the time of historic contact included the length of the Columbia River from The Dalles to the Pacific Ocean, as well as adjacent areas of the coast from Willapa Bay on the north to Tillamook Head on the south. To the north and south of these coastal Chinook settlements were Salish speakers. This portion of the coast and river are thus referred to by Drucker (1955) as the Coast Salish-Chinook Province of the Northwest Coast Culture Area. More recently, Hajda (1984) has referred to this region as the "Greater Lower Columbia."

The lower Columbia River Valley was occupied by Chinookan-, Salish-, and Athabascan-speaking peoples. The Salish-speaking Cowlitz lived on the north side of the river, and the Athabascan-speaking Tlatskanie (or Klatskanie) were found on the southern side. It is uncertain whether either group had villages along the river shores. Verne Ray (1938:36) places the Klatskanie along the south shore from Puget Island upstream an indefinite distance, with the Cowlitz occupying the northern river frontage from near Longview to Vancouver. His informant furnished specific locations, descriptions and names of both Cowlitz and Klatskanie villages along the river, declaring that "...they were not merely recent encroachments". Other ethnographers exclude the Cowlitz and Klatskanie from the river's edge, placing them

somewhat inland, in low hills near the river.

In essence, though, the lower river was occupied primarily by Chinookan-speaking peoples. The Lower Chinook held the territory along the lower reaches of the Columbia and adjacent coastal area, with the Upper Chinook occupying the river as far east as The Dalles. The Lower Chinook includes the Clatsop and the Chinook proper. The Clatsop lived along the south bank of the river from Tongue Point to the river's mouth, and the adjacent coast as far south as Tillamook. The Chinook proper occupied the corresponding lands along the northern side of the river, as well as the adjacent coastline, including Shoalwater (Willapa) Bay. Figure 1, adapted from Ray (1938:37) shows the approximate locations of the native ethnographic grouping along the lower Columbia River. This figure represents the territory of the Lower Chinooks about the year 1800.

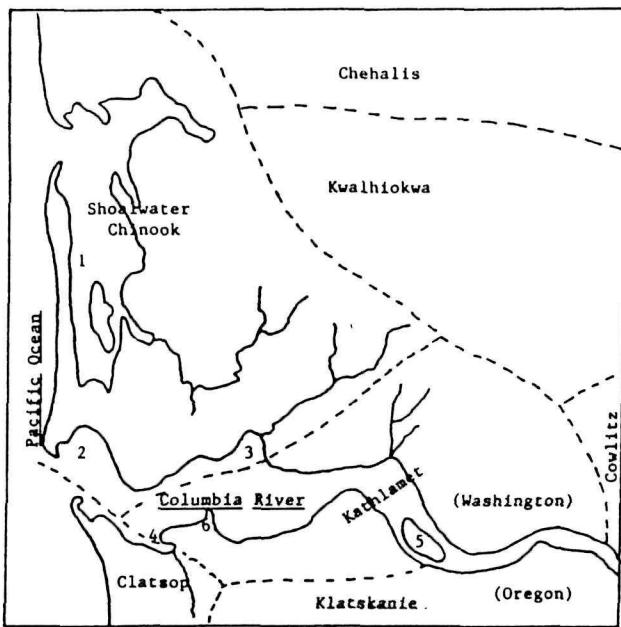


Figure 1: Native Ethnographic Groupings Along The Lower Columbia River.

Geographic Features:

1. Willapa Bay
2. Bakers Bay
3. Grays Bay
4. Youngs Bay
5. Puget Island
6. Tongue Point

ENVIRONMENTAL BACKGROUND

The most salient features of this territory include the Pacific Ocean and the Columbia River. The river, largest on the Pacific Coast of North America, has a length of 1950km and a combined drainage with tributaries of about 671,000km² (Trefethen 1972:77). Most of this drainage basin is situated within the interior Columbia Plateau; major tributaries include the Snake, Willamette, Cowlitz and Lewis Rivers. From the Plateau, the river flows westward toward the Cascade Range, north and westerly through the Coast Range, and into the Pacific Ocean near Hammond, Oregon. Prior to construction of the South Jetty (beginning in the 1880s), the southern edge of the mouth of the river was at Point Adams, about 4km inland from the present coastline at Clatsop Spit. The northern boundary of the river's mouth was Cape Disappointment, a rocky headland rising some 60 meters above the river's surface.

The lower reach of the river includes four large bays, separated by rocky headlands. On the southern (Oregon) side, Young's Bay is just upriver from the mouth, between Point Adams and Smith Point, with Cathlamet Bay farther east, between Tongue Point and Aldritch Point.

On the northern (Washington) shore, Baker Bay lies between Cape Disappointment and Ellice Point. Upriver is Grays Bay, between Grays Point and Harrington Point. Each of these four large embayments is fed by tributary streams and rivers. Youngs River and the Lewis and Clark River flow into Youngs Bay, while

the John Day River, Gnat Creek and Big Creek run into Cathlamet Bay. On the northern shore, the Chinook and Wallucut Rivers empty into Baker Bay, with the Deep and Grays rivers emptying into Grays Bay. Also on the northern side of the Columbia, Skamokawa Creek and the Elochoman flow directly into the river. These bays and rivers were very important, in terms of subsistence and travel to the native inhabitants. In the adjacent coastal territories, the Chinooks occupied the area around Shoalwater (Willapa) Bay to the north of the Columbia, this bay being fed by nine creeks and sloughs, and Clatsop Plains from the Columbia River mouth south some 30km to Tillamook Head, south of the town of Seaside. In this area, Skipanon and Neacoxie Creeks and the Necanicum River were also important to the Chinookan inhabitants as routes of travel and in subsistence.

The terrain surrounding the lower Columbia River is characterized by the hills which form the western edge of the Coast Range. The topography of the land south of the river is somewhat less rugged than that to the north, being of generally lower elevation and therefore less deeply dissected by watercourses. There is relatively little flat dry land on either side of the lower river, with mud flats, tidelands and marshes being common, especially in the bays most affected by tidal fluctuations. Dune systems are found within the Chinook territory along the coast both to the north and to the south of the Columbia.

The geological features of the lower Columbia River are of

relatively recent origin. Tertiary marine sediments and Miocene volcanics dominate the structural geology of the section of the river west of the Cascade range (Baldwin 1981). Alluvial and glacial deposits (of fine silt, sand, clay and fine gravels) comprise the major portion of the area's surface deposits.

Extensive movement of sand down the river is responsible for the massive pre-jetty shoals near the mouth of the river, and for the formation of the North Beach peninsula (the western boundary of Shoalwater Bay) and the large series of sand dunes which make up Clatsop Plains.

The soils found along the lower river's edge are closely related to the underlying geological structure. In the areas most frequently occupied by the Lower Chinook Indians, the alluvial soils have a relatively simple profile: the A horizon is variable but usually well-drained areas, the B horizon is absent, and the C horizon is typically composed of layers of alluvial materials. Humic Gley soils frequently occur in more poorly-drained areas, such as swamps and meadows. Here again the C horizon is alluvium, the B horizon is usually mottled with clay, and the A horizon is dark, organic material. The soils at many encampments occupied in this area were subject to flooding, slumping and deflation, presenting a problem in reconstruction of prehistoric settlement pattern. Furthermore, changes in sea level may have also affected prehistoric cultural resources. While a post-Pleistocene sea level rise did occur with the retreat of continental glaciers, tectonic uplifting of the

shoreline was also in process, albeit in an uneven fashion. Although sea level probably stabilized at about the time the present climatic regime was established (some time after about 4000 bp) and hence would not affect sites occupied since that time, there are several archaeological sites whose occupation zones are partly submerged. These sites are located at Netarts and Nehalem bays on the coast (Newman 1959; Woodward 1981), Eddy Point (near Knappa, Oregon, [Minor 1983], on the lower Columbia River), and as far upriver as the Portland basin (Strong 1973). It is possible that sea level (and therefore river levels) have not been stabilized for as great a period of time as previously supposed. If this is the case, early sites along the coastline and river shores have very probably been destroyed (Aikens 1984).

The climatic conditions of the lower Columbia River are generally mild and temperate, characteristic of the North Pacific coastline in general. Winter storms are cyclonic, the result of atmospheric low-pressure systems which approach the coast from the oceans on the dominant westerly winds. These storms bring moderate temperatures, abundant rain and strong winds from the south or west. Hail storms, thunderstorms and snowfall are infrequent along the lower river and adjacent coast, although fog and winter rains may continue without interruption for many days.

Summer weather, which results from an offshore high pressure cell, includes winds from the north and west, moderate temperatures, little rain and frequent fog. "Typical" summer weather may occur during the winter, and vice versa. The mean

annual temperature (at Astoria, near the mouth of the river) is about 11 degrees Celsius with a mean winter temperature of about 6 degrees Celsius. The Coast Range has a great influence on rainfall and climate: in general, amount of precipitation increases rapidly with elevation on the west slope of the range, decreasing from the summit eastward. Along the river itself, rainfall decreases eastward (upriver). Precipitation at Astoria averages approximately 1,955mm per year, mainly in the period from October through April.

FLORA AND FAUNA

Just as the river and ocean dominate other aspects of Lower Chinook life, they are the primary factors in the biotic environment. While salmonid fishes have dominated most reports on the Chinook subsistence, it is important to recognize the immense contribution made to their lifeways by the other organisms in their ecosystem. The present section includes flora and fauna present in the lower Columbia River area; actual reported use of plants, and mammals, birds, fish and other fauna by the Chinooks will be discussed later.

FAUNA

The major estuarine resource, from prehistoric into historic eras, has been the Chinook salmon (Oncorhynchus tshawytscha), though other migratory salmonids are, or have been, present. These include coho salmon (Oncorhynchus kisutch), sockeye salmon (Oncorhynchus nerka), chum salmon (Oncorhynchus keta), pink salmon (Oncorhynchus gorbuscha), and steelhead trout (Salmo

gairdneri). Other salmonids found in the lower Columbia River include cutthroat trout (Salmo clarki) and mountain white fish (Prosopium williamsoni). Anadromous fish, migrating in the Columbia River and its tributaries in well-defined seasonal runs, have always been of extreme importance to the inhabitants of the estuary.

In addition to the salmonids mentioned above, over 55 species of non-salmonids are presently found in the lower Columbia River (Pruter 1966). Among the more common species are white sturgeon (Acipenser transmontanus), Pacific herring (Clupea harengus pallasi), northern anchovy (Engraulis mordax), longfin smelt (Spirinchus thaleichthys), eulachon (Thaleichthys pacificus), Pacific tomcod (Microgadus proximus), shiner perch (Cymatogaster aggregata), starry flounder (Platichthys stellatus), English sole (Parathrys vetulus), and sand sole (Psettichthys melanostictus). Although shad, largemouth bass, yellow perch and freshwater catfishes are presently found in the estuary, they are all recently introduced species.

A number of species of marine mammals are known to inhabit the Columbia River estuary and adjacent coastal waters, some as migrants and others as permanent residents. Of some 29 species of marine mammals currently found in this area, most are cetaceans, usually found offshore. Five species of cetaceans are likely to occur in or near the estuary: Killer whale (Orcinus orca), harbor porpoise (Phocoena phocoena), Dall porpoise (Phocoenoides dalli), Minke whale (Balaenoptera acutorostrata) and

gray whale (*Eschrichtius robustus*). Gray whales and Dall porpoise are seasonally abundant in offshore waters, while harbor porpoise are year-round residents of the area.

Another marine mammal, the sea otter (*Enhydra lutris*), historically was abundant near the lower Columbia, but over-exploitation has completely eliminated these local populations.

Three species of pinnipeds are regularly found in this area: the harbor seal (*Phoca vitulina*) and northern sea lion (*Eumetopias jubata*) both breed in Oregon, and the California sea lion (*Zalophus californianus*), after a spring breeding season in southern California and Mexico, occurs in the Columbia and adjacent areas.

The lower Columbia River area has an especially abundant supply of avifauna, both resident and migratory. The region lies in the path of the Pacific flyway, and over 175 species of birds can be found in the lower river basin. Included on checklists are loons, grebes, pelicans, cormorants, herons, geese, teals, mallard and other ducks, eagles and hawks, gulls, sandpipers, plovers, terns, woodpeckers, swallows, wrens, jays, sparrows, and a wide variety of other species.

Some 45 species of reptiles and amphibians may be found in the lower Columbia River basin. These include numerous varieties of salamanders, newts, toads, frogs, turtles, lizards and snakes. Reptiles and amphibians were of less economic importance to the aboriginal inhabitants of the area than land and marine mammals, birds, and fish.

Four species of larger crustaceans are abundant in the estuary of the river. The dungeness crab (Cancer magister), sand shrimp (Crangon franciscorum) and blacktailed shrimp (Crangon sp.) are found in the lower estuary; the freshwater crayfish (Pacifastacus leniusculus) occurs in the upper estuary, including sloughs and tributary streams.

Nearly a hundred different species of land mammals, including both herbivores and carnivores, are to be found in the region. These range from the smaller mice, rats, shrews, moles, chipmunks, rabbits, gophers, and others, to deer (Black-tailed, mule and Columbian white-tailed, Odocoileus hemionis columbianus, O.h. hemionus, and O. virginianus leucurus, respectively) and elk (Cervus canadensis). Carnivores include red fox (Vulpes fulva), gray fox (Urocyon cinereoargentens), coyote (Canis latrans), black bear (Ursus americanus), raccoon (Procyon lotor), marten (Martes americana), fisher (M. pennanti), bobcat and lynx (Lynx rufus and L. canadensis), and others, including mountain lion (Felis concolor).

The Pacific coastal areas to the north and south of the Columbia River provide a potential wealth of resources, both on sandy beaches, mud flats, and rocky intertidal zones. Arthropods commonly found include barnacles (acorn barnacle [Balanus glandula] and gooseneck barnacle [Pollicipes sp.]), and molluscan resources include chitons (primarily Katherina tunicata), gastropods (limpets, Diodora sp.; basket snail, Nassarius sp.; Olive shell, Olivella biplicata) and pelecypods, especially

mussel, Mytilus edulis and M. californianus; and also horse clam, Schizothaerus sp.; butter clam, saxidomus sp.; cockle, Clinocardium sp.; and razor clam, Siliqua sp.. and Solem sicarius; geoduck (Panope generosa); little-neck clam (Prototthaca staminea); mud clam (Spisula catilloformis); and sand clam (Macoma sp.).

FLORA

The vegetation of the region inhabited by Lower Chinooks is a combination of Riparian, Mixed Hardwood, and Northwest Coniferous forests (Franklin and Dyrness 1973). Riparian forests occupy the many low-lying, poorly-drained, seasonally-flooded sites along the Columbia and its tributaries. These areas are characteristically dominated by willow (Salix spp. and cottonwood Populus spp.), and include Oregon ash (Fraxinus latifolia) and red alder (Alnus rubra). Away from the river, one finds red alder, Douglas-fir (Pseudotsuga menziesii), western red-cedar (Thuja plicata), western hemlock (Tsuga heterophylla) and Sitka spruce (Picea sitchensis) of the classic moderate, temperate coniferous forest.

Mature coniferous forests of the northwest typically have lush understory vegetation consisting of shrubs, herbs, ferns, and cryptogams. Species found in typical communities depend on a number of environmental factors, including precipitation, elevation, winds, salt spray, slope, aspect and soils. The territory of the Lower Chinook includes examples of a variety of understory communities within the coniferous forests. In less

favorable environments, such as steep slopes facing the Pacific Ocean and on old sand dunes, understory vegetation is dominated by salal (Gaultheria shallon), rhododendron (Rhododendron macrophyllum), kinnikinnick (Arctostaphylos uva-ursi) and evergreen-huckleberry (Vaccinium ovatum). Sites intermediate in environmental conditions typically contain sword fern (Polystichum munitum), wood or Oregon sorrel (Oxalis oregana), wild-lily-of-the-valley (Maianthemum dilatatum), candy flower (Montia sibirica), bracken fern (Pteridium aquilinum) and, important as food, a variety of berries, including red elderberry (Sambucus racemosa), thimbleberry (Rubus parviflorus), salmonberry (Rubus spectabilis), and blackberry (Rubus ursinus). Wetter forested sites contain, in addition to those species mentioned above, devil's club (Oregonia horridum), lady fern (Athyrium filix-femina), deer fern (Blechnum spicant) and wood fern (Dryopteris dilatata).

Special environments found in this area include marshes, characterized by rush (Juncus spp.), cattail (Typha latifolia) and horsetail (Equisetum spp.) moving into sedge, willow and cottonwood at slightly higher elevations and sand dune/strand communities, including such halophytic species as largeheaded sedge (Carex macrocephala), seaside dock (Rumex maritima), beach knotweed (Polygonum paronychia), yellow sand-verbena (Ambronia latifolia), coastal wild strawberry (Fragaria chiloensis) and seashore lupine (Lupinus littoralis). Above the beaches are communities of coast or shore pine (Pinus contorta) as well as

Sitka spruce, kinnikinnick, huckleberry and salal.

The aboriginal inhabitants of the lower Columbia River fit comfortably into this wealthy environment, with its abundance of resources, which served as raw materials for food, shelter, medicine, transportation, clothing and other requirements of life in this locale.

The plants and animals of the region, exploited by a sophisticated technology and social structure, supported a population density higher than that of any other area in Oregon.

ETHNOHISTORIC BACKGROUND

Reconstructing native use of plants in the Chinook territory is a somewhat difficult process, given the deleterious effects on these people of contacts with Euro-american explorers and pioneers. Initial visits to the region by Europeans and Euro-americans include the Spanish explorer Martin De Aquilar (1603), D. Bruno Haceta (1775) and John Meares (1788). The Columbia River's mouth and estuary were first actually explored by Captain Robert Gray in May of 1792. Gray's party sailed about 20 miles upstream from the mouth of the river. Later, in November 1792, Lieutenant William Broughton of Captain Vancouver's party anchored his armed tender, H.M.S. Chatham, near the mouth of the river, and taking the vessel's launch and cutter, explored the lower 100 river miles, ascending the river to a point east of Portland (Scott 1924). There was little information recorded in these visits of the natives then occupying the area.

By contrast, the overland expedition of Captains Meriwether Lewis and William Clark provides a wealth of data on the nature and inhabitants of the lower Columbia River region. The expedition reached the cascades of the river on October 30, 1805. The next six months were spent on the lower river, including the winter of 1805-06 at Fort Clatsop. The explorers made extensive observations on the geology, flora and fauna of the area, as well as the lifestyle of the indigenous peoples. Even by this time, however, the native culture had been severely affected by contacts with Euro-American and European traders and explorers and their devastating infectious diseases. Native cultures changed, and native populations declined, rapidly during the next quarter century. Epidemics of infectious diseases struck the region sometime around 1750, again in 1782-3 (smallpox) and once again in the 1830's. Although James Mooney (1928) suggests a population of 22,000 from the Cascades of the Columbia to its mouth, more recent work by Taylor (1963) presents an estimate of 5,000 inhabitants as of 1780. Mooney included estimates of about 2,000 natives at the mouth of the river, consisting of 800 Chinooks, 300 Clatsops, 300 Wahkiakums and 450 Kathlamets. In 1805 Lewis and Clark estimated 400 on the Columbia River itself, and in 1885 Swan counted 112. The Indians of the lower Columbia River and adjacent areas suffered greatly from venereal disease, measles and smallpox, but the worst was the "intermittent fever" (thought to have been either malaria or viral influenza), with some villages reduced by 75 percent or more (Boyd 1975; Cook

1955; Taylor and Hoaglin 1962). Boyd and Hajda (1987) have recently reconsidered some of these early population estimates in light of seasonal population movements by the native inhabitants of the region.

As Berreman (1937) has pointed out, these epidemics led to depopulation which has been of much consequence to those trying to reconstruct aboriginal lifestyle:

The epidemics referred to began to ravage the country after the first white contacts on the lower Columbia, at least as early as 1800. They were particularly disastrous in the next thirty years, in which time whole tribes seem to have completely disappeared, and the native population was reduced to a small fraction of its former numbers. It hardly need be pointed out that this disaster to the Indians was little less than catastrophic also for the student who would reconstruct the culture and geographic arrangement of these tribes.

Since the native cultures were all but vanished by the mid-nineteenth century along the lower Columbia, it is necessary to rely on the fragmentary reports of travellers and explorers for information on native lifestyles. There is, fortunately, also ethnographic data available on these people and their cultural systems. The above-mentioned Lewis and Clark expedition provides information from 1805-06 on, primarily, the Clatsop, but also on the Chinook proper, Wahkiakum and Kathlamet peoples.

In the decades following the establishment of Fort Astoria in 1811, several fur traders and missionaries to the area published narratives of their visits, some including stories of the native population and their lifestyles (see Cox 1832; Parker

1838; Lee and Frost 1844; Ross 1849). Gabriel Franchere (1968), a clerk at Astor's Pacific Fur Company, for example, devoted a chapter of his journal to "The Native Inhabitants." The Reverend Joseph H. Frost, who established a mission on Clatsop Plains, later wrote from his journal of the Indians and their lifeways as they were in the early 1880s (Lee and Frost 1968). At the time of the unratified Treaty of Tansy Point (1851), the few remaining natives of the area ceded most of their territory, and many moved to the Grand Ronde and Siletz Reservations in western Oregon. These people often intermarried with members of other tribes and adopted a mixed reservation culture. Other Lower Chinooks remained in the area around the mouth of the river to work in the canning, fishing and oyster harvesting industries.

The major ethnographic accounts from this later era include Chinook Texts and Kathlamet Texts, tales and myths collected by Franz Boas in the 1890s from an aging Chinook- and Kathlamet-speaking informant named Charles Cultee (Boas 1894; 1901). The last of the major ethnographies was the Lower Chinook Ethnographic Notes, published in 1938 by Verne Ray. This work, based on Ray's interviews with two aged native informants of tribally-mixed background is a very important source of information on the native lifestyles of the lower Columbia, but it must be used with caution.

SUBSISTENCE

By far the most important resource of the Lower Chinook,

both for consumption and trade, was fish. Of all the species taken, the most important was salmon. Little ocean fishing took place since the Columbia and its tributaries and the bays of the region were quite productive, easily accessible and much safer fishing grounds. Of the five species of salmon which enter the Columbia to spawn (chinook, coho, sockeye, chum and pink), chinook were favored. Steelhead trout were also considered salmon by the natives. Four principal techniques were used to harvest the salmon resource, including sieve nets, weirs placed across small tributary streams, spearing with a leister and dip nets.

Sturgeon, taken with hook and line or net, was greatly prized because of the great size of the fish. Franchere (1968: 108) relates catching one of 390 pounds, "...even after the eggs and intestines had been drawn." Alexander Henry, visiting the area in 1814, mentioned that large numbers of sturgeon were taken at the time of the eulachon runs (Henry 1897:832). Smelt, eulachon and herring, taken with dip nets or rakes, were prized for their oil. Alexander Ross (1966) describes the preparation of the fish for trade:

The ulichans are generally an article of trade with distant tribes, as they are caught only at the entrance of the large rivers. To prepare them for a distant, they are laid side by side, head and tail alternately, and then a thread run through both extremities, links them together, in which state they are dried, smoked, and sold by fathom...

Franchere (1968:113) describes this fish as the chief nourishment of the natives during April, May and June.

Several species of aquatic mammals were used by the Lower Chinook for both food and clothing. The harbor seals, fur seals, sea lions and sea otters were usually speared as they hauled out on rocks, beaches and sand bars. The fur of the sea otter was highly valued; the meat of seals was cooked in the animal's blood, and the blubber rendered for the oil (Swan 1969:84). Whales were highly prized for food and oil, though only dead and stranded individuals were apparently taken.

A variety of shellfish were also utilized by the natives of the area, with clam species being most important. Among the clam species gathered were the geoduck, sand clam, cockles, mud clam, macoma, little-neck clam and razor clams. Clams were dug by hand or with a specialized digging-stick. Mussels and crabs were also used, though they were of less importance than various clams.

Land mammal hunting took place as both an individual and group activity. Pitfalls, surrounds, and bow and arrow hunting were used to kill both deer and elk. These animals provided food as well as furs for clothing and blankets for their own use and as trade items. Lewis and Clark describe elk pits as being cubes of twelve to fourteen feet, covered with slender boughs and moss, placed on habitual game trails. The pits were dug behind logs fallen across the path; when the animal leaped over the log it fell into the pit (Thwaites 1969 III:347). Beaver, bear and rabbits were also utilized, though less often than deer and elk.

Although fishing and hunting were the principal economic pursuits of the Chinook, plants also played a very important, and

often overlooked, part in their technology and subsistence. Roots, shoots and berries were a significant portion of the native meal, providing vitamins, minerals and roughage unavailable in the otherwise fat- and protein-heavy diet. Vegetal matter also served as a major resource of raw materials for building, transportation, cooking, clothing, tools and other utensils.

PLANT FOODS

Roots of various plant species probably outweighed in importance other plant parts used for food. Lewis and Clark, during their stay at Fort Clatsop in 1805-06, made a number of observations on native plant use, noting that roots "...furnish a considerable porportion of the subsistence of the Indians in our neighborhood..." (Thwaite's 1969 111:363). They further describe the most important as "...a Species of Thistle, fern, and rush; the Licquorice, and a small celindric root the top of which I had not yet Seen...". These represent lupine, bracken fern, horsetail rush, and edible thistle. Also the wapato was imported in quantity from peoples living upriver, principally the Klatskanie. Camas was also obtained through trade. The first section roughly follows Ray (1938).

ROOTS AND RHIZOMES

BRACKEN FERN (Pteridium aquilinum). This large, common fern is found widely distributed in open uplands and among sparse timber. The fern may grow to 15 dm in height, and with perennial rhizomes running horizontally for great distances. Lewis and

Clark (IV:5) describe the "root" as "...celindric, with few or no radicles, an from the size of a goose quill to that of a man's finger; the center of the root is divided into two equal parts by a strong flat and white ligament like a piece of their tape. On either side of this there is a white substance which when the root is roasted in the embers is much like wheat dough and not very unlike it in flavor, though it has also a pungency which becomes visible after you have chewed it some little time; this pungency was disagreeable to me, but the natives eat it very voraciously and I have no doubt but it is a very nutricious food." Ray (1938:129) notes that, "Roots of the bracken fern were singed and eaten or roasted. When dried they were mixed with fish eggs."

EDIBLE THISTLE (Cirsium edule). Of this plant Lewis and Clark (IV:4) say "The root of the thistle called the natives 'Chan-ne-tak-que' is pirpendicular and possesses from two to four radicles; is from nine to fifteen inches in length and is commonly about the size of a mouse thumb the rhine somewhat rough and of a brown colour; the consistence when first taken fromm the earth is white and nearly as crisp as a carrot, when prepared for use by the same process before described of the white bulb or 'pas whe quo, qua-mosh', it becomes black and is more sugary than any root I have met with among the natives; the sweet is prosisely that of the sugar in flavor, this root is sometimes eaten when first taken fromt he ground without any preperation; in this way it is well tasted but soon weathers and becomes hard

and insipped." Clark again (IV:7) mentions the thistle root "...after undergoing the process of sweting or bakeing in a 'kiln' is sometimes eaten with the train oil also, at other times pounded fine and mixed with cold water, until reduced to the consistancy of Gruel; in this way I think it verry agreeable."

SEASIDE LUPINE (Lupinus littoralis). The "licquorice" of Lewis and Clark is referred to often by the explorers as an important native food. It grows abundantly in the sandy soil along the river and the ocean beach and reaches a large size. Clark reported that "...the nativs roste it in the embers and pound it slightly with a small stick in order to make it seperate more readily from the strong ligaments which forms the center of the root; this they discard and chew and swallow the ballance of the root...This root when roasted possesses an agreeable flavour not unlike the sweet potato" (IV, 6-7). Lupine was one of the gifts presented to the explorers by the Clatsop chief "Co-ma wool" just after Christmas, 1805: "These roots and berries are timely and extreamly greatfull to our stomachs, as we have nothing to eate but Spoiled Elk meat..." (III,292).

HORSETAIL RUSH, GIANT HORSETAIL (Equisetum telmateia). Lewis and Clark describe the root of this plant as insipid in flavor, though the plant is quite abundant in wet sandy grounds along the coast. "The root of the rush used by the nativs is a solid bulb about one inch in length and usially as thick as a mans thumb, of an ovel form depressed on two or more sides, covered with a thin black rine. the pulp is white brittle and

easily masticated either raw or roasted, the latter is the way it is mostt commonly prepared for food" (IV,8-9). Swan, describing the Chinooks around Shoalwater (Willapa) Bay, also mentions "The root of a species of rush, found baked; its taste raw is similar to the Jerusalem artichokes and baked resembles a mealy potato"(1969:88).

WAPATO, or ARROWHEAD (Sagittaria latifolia). Clark describes (IV:7) "...the most valuable of all their roots" as "foreign to this neighbourhood" (Fort Clatsop). "The "Wappetoe", or bulb of the Sagitifolia or common arrow head...forms a principal article of trafic between the inhabitants of the vally and those of their neighbourhood or sea coast." Swan (1969:89-90) also mentions the plant: "On the Columbia River, an excellent root, called the Wappatoo, which is the bulb of the common Saggitalia, or arrow-head, is found in abundance, and is a favorite food of the wild swans, which are very plentiful. The Wappatoo is an article much sought after by the interior Indians, but there is none found on the coast, except in very small quantities." Alexander Ross, the clerk at Fort Astoria, described wapato as "...a favourite article of food at all times of the year. This esculent is highly esteemed by the whites..." (1966:95).

CAMAS (Camassia quamash). This root, a very important source of food throughout western Oregon, probably did not occur near the mouth of the Columbia or around Willapa Bay. Ray (1938:100) describes wapato and camas as imported from upriver

groups in great quantities. Lewis and Clark (IV:4) mention camas briefly, in discussing the similarity in preparation techniques to the edible thistle. Swan (1969:90-1) says the plant is found in

"...moist places on the prairies. After the plant has done flowering, or when the Indians consider it ripe, which is usually in September and October, the root is dug up by the squaws, who go out in parties for the purpose, and are generally absent several days. After sufficient has been collected, the leaves and loose ouhusks are removed, and the whole roasted on hot stoves. The method is as follows: a large pile of dry wood is made, on the top of which a quantity of stones are piled; fire is then applied, and kept up till all the wood is burned, leaving nothing but the stones and ashes. Fern-leaves are then laid on the stones, and on these mats are placed; the camass-roots are then placed on the mats, and spread level; water is then thrown over them, and immediately they are covered with mats, blankets, and the whole covered up with sand, every cave being taken to keep in all the steam. This heap is allowed to remain till it is cold, which, according to the size of the fire and quantity of roots used, varies from twelve to twenty-four hours. The roots then are soft and very sweet, much like a baked sweet potato. The natives preserve them by pressing them into loaves, which, when eaten, are cut in slices like pudding."

Franchere (1968:178-9) may have been describing camas when he wrote: "One of these roots that looks very much like a small onion, the Indians, in the place of wheat. Gathering a sufficient amount, they bake them on red-hot stones from the fire, after which they knead them until they are reduced to a paste, and then form them into loaves of five or six pounds each. This 'bread' tastes something like licorice." Turner and

Kuhnlein (1983) also describe camas use among the Northwest Coast peoples.

CATTAIL (Typha latifolia). Swan (1969:88) says, "The root of the common cat-tail flag is eaten raw, and I found it, sliced with vinegar, very platable." Lewis and Clark (IV:121-2), while at Fort Clatsop, noted that, "The Indians of this neighbourhood eat the root of the cattail or cooper's flag-it is pleasantly taisted and appears to very nutricious. the inner part of the root which is eaten without any previous preperation is composed of a number of capillary white flexable strong fibers among which is mealy or starch like substance which readily dissolved in the mouth and seperate from the fibers which are then rejected."

SKUNK-CABBAGE (Lysichitum americanum). The root of this plant was prepared by boiling and eaten, but was apparently not very highly prized by the Lower Chinook. Swan (1969:87) says, "The root of the common skunk cabbage, after being boiled and patially deprived of its acrid properties, is eaten with avidity, but I was never very partial to the dish."

COW-PARSNIP (Heracleum lanatum). Ray (1938:121) noted that "The root as well as the stem of this plant was utilized."

FRUITS

A large number of berries and other fruits were available to the Lower Chinook peoples over a great portion of the year. Swan (1969:88) notes the importance of the variety of berries: "As the season advances and the fruited ripen, great quantities are

used as food, to the exclusion of fish and meats." Some of the berries were eaten fresh, while others were stored for later use.

SALMONBERRY (Rubus spectabilis). The first fruits of the season were salmonberries, which were eaten fresh, being too soft to dry. Swan (1969:88) mentions their use at Willapa Bay. Gunther (1973:35) mentions a wide variety of northwest native users of the berries.

WILD STRAWBERRY (Fragaria chiloensis). Also known as the seaside strawberry, these fruits, too, were eaten fresh, being too soft and juicy to dry. Lee and Frost (1968:86) describe them as abundant at Clatsop Plains. Swan (1969:88) also describes wild strawberries as being found in great quantities on the Long Beach Peninsula, as well in "...all the prairie lands on or near the coast."

SALAL (Gaultheria shallon). The berry of the salal was widely used for food all along the British Columbia, Washington and Oregon coasts. They were eaten both fresh and dried in cakes to be stored for winter use. Swan (1969:89) describes the salal as "...excellent cooked in any form, and is dried by the Indians, and pressed into cakes containing some five or six pounds, which are covered with leaves and rushes, so as to exclude the air, and then put away in a dry place for winter's use." Lewis and Clark (IV:52-3) also describe salal in some detail.

OREGON CRABAPPLE (Pyrus fusca). The fruit of this tree, also known as western crabapple, ripen in the autumn, at which time they were harvested by the Lower Chinook. Lewis and Clark

(IV:20) describe the fruit as "...exceedingly assid, and resembles the flavor of the wild crab." Swan also mentions the tree (1969:89): "The wild crab-apple also grows in abundance, and is eaten by the Indians after being simply boiled." Lee and Frost (1968:86) describe the crabapple as "...very much used by the Indians."

KINNIKINNICK (Arctostaphylos uva-ursi). This plant, also called bearberry, provided both fruit and leaves to smoke. Lewis and Clark (IV:25-26) describe the plant in some detail, including the native's use of it; "the nativs on the west side of the Rocky mountains who can procure this berry invariably use it; to me, it is a very tasteless and insipid frute. the nativs usually eat them without any preparation. these berries are sometimes gathered and hung in their houses in bags where they dry without further trouble, for in their succulent state they appear to be almost as dry as flour." Swan (1968:88) also mentions the plant "The dry, mealy berries of the Arbutus uva ursi, or bear-berry, are bruised and eaten with oil, and the dried leaves, called quer-lo-e-chintl, are smoked like tobacco."

OTHER FRUITS. Numerous other berries were reportedly utilized by the Chinook Indians as food, though less often than those mentioned above. Among the species variously described by Lewis and Clark, Swan, Ray, Gunther, and Lee and Frost, are western redhuckleberry (Vaccinium parvifolium), evergreen huckleberry (V. ovatum), bog cranberry (V. oxycoccus), Oregon grape (Berberis nervosa) syn. (Mahonia nervosa), currants and

gooseberries (Ribes spp.), wild raspberries and blackberries (Rubus spp.) and thimbleberry (Rubus parviflorus).

STEMS AND NUTS

GARRY OAK (Quercus garryana). According to Ray (1938:129-30), acorns were the only nut extensively used by the natives around the mouth of the Columbia and the Willapa Bay area. These were collected on trips upriver or through trade.

The stems of horsetail rush (Equisetum telmatia), salmonberry (Rubus spectabilis), cow-parsnip (Heracleum lanatum), and the leaves of western or yellow dock (Rumex occidentalis), were generally eaten raw. Of the use of salmonberry sprouts, Swan (1969:87) says;

"The most pleasant, cooling, and healthy vegetable is the sprout of the wild raspberry. These sprouts are collected in bundles and brought in to the lodge, where they are denuded of their tough outer skin, and the centre is crisp and tender a cucumber, and, being slightly acid, is delicious. They are slightly astringent; and as the herring begin to make their appearance at the same time, and from their oily nature, and the immoderate manner in which the Indians eat them, are apt to produce disorders of the bowels. the sprouts, being freely eaten at the same time, counteract the effect".

The same author (1969:87) also describes the tender and aromatic cow-parsnip stalks, the outer skin having been peeled off, as "...a very grateful addition to the dried salmon eggs

which are not brought on for food".

Swan (1969:87) says, "The leaves of the yellow dock are boiled, then bruised up into a pulp, and eaten with sugar and molasses, if they can be obtained, or else with oil."

It is very probable that a number of other species of plants were harvested, either regularly or sporadically, by the Lower Chinook Indians, but not as first-choice foods. It is also probable that they were aware of the dietary or medicinal value of many other plants from their extensive contacts with other native peoples in the region.

Gunther (1973) describes the use of a wide variety of other plants by the natives of western Washington, including the southern portion of that region. It is reasonable to suppose that the Lower Chinook were aware of these uses. Among those plants used for food in this general locale were the following:

<u>Polystichum munitum</u>	Sword fern
<u>Dryopteris dilatata</u>	Wood fern
<u>Athyrium filix-femina</u>	Lady fern
<u>Equisetum arvense</u>	Field horsetail
<u>Allium cernuum</u>	Nodding onion
<u>Lilium columbianum</u>	Tiger lily
<u>Maianthemum dilatatum</u>	Wild-lily-of-the-valley
<u>Corylus cornuta var. californica</u>	Hazelnut
<u>Rumex acetosella</u>	Sheep-sorrel dock
<u>Ambronia latifolia</u>	Sand verbena

<u>Berberis aquifolium</u>	Large Oregon-grape
<u>Rosa nutkana</u>	Wild rose
<u>Osmaronia cerasiformis</u>	Osoberry, Indian-plum
<u>Oxalis oregana</u>	Wood sorrel
<u>Sambucus racemosa</u>	Red elderberry
<u>Sambucus cerulea</u>	Blue elderberry

CONCLUSION

The Lower Chinook certainly used plant products extensively for non-dietary purposes, including shelter, clothing, transportation, storage, tools, weapons, utensils, cordage, medicine and so on. While their lives focused on the riverine and to some extent terrestrial faunal resources, there is no doubt that their use of plants was extremely important.

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