

THE ETHNOBIOLOGY OF THE CENTRAL YUP'IK ESKIMO, SOUTHWESTERN ALASKA

Dennis Griffin

Oregon State Historic Preservation Office, 725 Summer Street, NE, Suite C, Salem, OR 97301; dennis.griffin@state.or.us

ABSTRACT

Alaska is the home of many diverse Native peoples who inhabit a wide variety of environments. To survive and flourish in these environments it was essential for people to be aware of the wide range of plant and animal species in their area. Published texts on Alaska Natives, particularly the Eskimo (e.g., Lee and DeVore 1968), and early popular films depicting Eskimo peoples (e.g., *Nanook of the North*, *Igloo*, *Eskimo*) have stressed the dependence of Native people on hunting in order to survive. While this dependence is undoubtedly true, the awareness and intensity of use of vegetal resources has often been overlooked. It is impossible to summarize in a single article the use of indigenous plants among all Native peoples of Alaska. This article focuses on southwestern Alaska in order to illustrate the range of knowledge and use of indigenous flora and shellfish by the Central Yup'ik Eskimo for food, medicine, and utilitarian purposes.

INTRODUCTION

Few early ethnographic studies in Alaska have highlighted Native knowledge and use of local flora. In fact the opposite was often the case, in that some observers expressed a belief that Eskimos had little knowledge of local herbs and roots (Whittaker 1937:115). While Young and Hall (1969:43) found that the Western Eskimo were more aware of and made use of more plant species than is generally acknowledged, the majority of regional studies fail to note the indigenous use of plants aside from the use of several tundra berry species and local greens. While the present study summarizes the known traditional use of indigenous plants in southwestern Alaska (Central Alaska Yup'ik), comparative data are also included for plant use among the peoples of St. Lawrence Island and Siberia (Siberian Yupik) and the Pacific Yupik of Prince William Sound (Alutiiq or Sugpiaq) (Fig. 1). To highlight the similarity and diversity in plant use and naming conventions in the coastal areas of Alaska and its offshore islands, information on the use of eighty-five species of indigenous terrestrial and marine plants and shellfish is noted.

FOCAL AREA OF RESEARCH

Information in this paper was primarily obtained from a twelve-year (ca. 1995–2006) collaborative anthropological project between the author and the Nuniwarmiut of Nunivak Island (see Fig. 2), and a compilation of published and unpublished sources of ethnobotanical use. Initial work with the Nuniwarmiut focused on dissertation research (Griffin 1999, 2004), tracing the history and importance of an Alaska Native village over the past 2,600 years by combining information available from a variety of sources (i.e., archaeological excavations, oral history narratives, ethnographic and ethnohistoric documents, historic photographs, and ethnological collections). This research sought to compile a history of the changing land use of one village and its position in Nuniwarmiut settlement and subsistence strategies. Specific use of the island's flora during the initial phase of research (1995–1996) was gathered informally while interviewing island elders about other information and

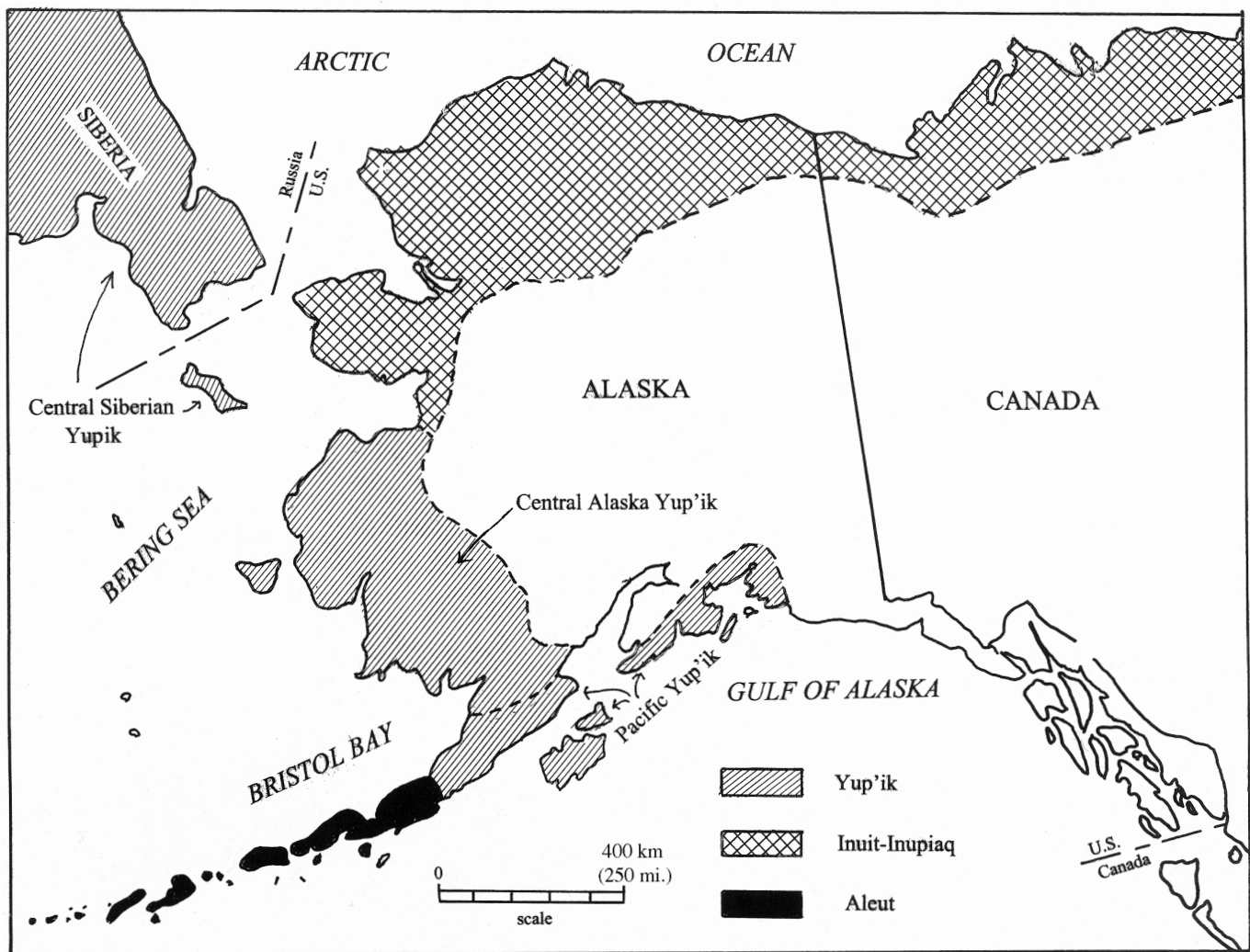


Figure 1. Distribution of Yup'ik speakers in Alaska.



Figure 2. Nuniwarmiut elders examining plant specimens (from left to right: Nan Kiokun, Helen Williams, George Williams, Sr.).

by joining local families on plant forays to gather seasonal greens or berries. Plant-specific information was shared during these trips. Subsequent, more in-depth interviews with elders took place from 1996–1998, during all seasons of the year, consisting of elders examining indigenous plant species. Fresh specimens were not always available during discussions so pressed and dried specimens collected while on the island were examined by elders. In cases where dried specimens proved of little use due to poor recognition resulting from color change and withered condition, published botanical guides with large color plates (e.g., Schofield 1989) were used to assist the discussion. Information regarding plant identification was later corroborated by Muriel Amos, a Nuniwarmiut educator who had conducted preliminary research on local plant species during the process of compiling a Cup'ig Eskimo dictionary (Amos and Amos 2003).

Initial interviews focused on the use of indigenous plants found growing in the low-lying tundra portions of Nunivak (the island's north and east coasts) culminating in a 2001 publication (Griffin 2001). Subsequent grants from the U.S. Fish and Wildlife Service permitted continued research on Nunivak from 1999–2006 to collect plant-use information along the southern coastal sand dunes and Nunivak's western cliff areas. Nuniwarmiut interpreters were used during all interviews to assist in gathering data on plant usage since my limited knowledge of Cup'ig prevented me from freely conversing with most elders, resulting in perhaps more abbreviated discussions of plant use. The majority of plant information was shared by both Nuniwarmiut women (ages 66–87; $n = 8$) and men (ages 73–95; $n = 6$), with interviews generally being conducted with two to four elders at a time in order to see if there was a general consensus on plant use. All plant and shellfish specimens were examined by a minimum of six elders. Most information shared by elders was consistent between interviews. However, the use of a few plant species was known only by one or two individuals. When information was limited or contradictory, I have listed the source of my information in the tables. In cases where many elders offered data consistent with previously published sources, no new specific references are cited. Audio recordings were made of all interviews in addition to video recordings during interviews from 1996–2006. Copies of all tapes and video recordings are on file with the Nunivak Island Mekoryuk Alaska (NIMA) Corporation and in the author's possession.

Species identification of plant specimens was obtained by using published guides to the flora of Alaska (Argus 1973; Barr and Barr 1983; Duddington 1971; Grout 1940; Hultén 1968; Viereck and Little 1972; Welch 1974) with taxonomy following that of Hultén (1968), except in cases of identifying bryophytes, where I used Grout (1940) and Steere (1978), and for seaweeds Abbot and Hollenberg (1976) and Guiry (1974). Plant specimens were preserved in the field by drying in plant presses. Voucher specimens are currently in the possession of the author. Not all plant species listed in the tables were identified during the current study. Previous collections of Nunivak flora have been collected by Eric Hultén (1968), Margaret Lantis (ca. 1946), Janet Fries (ca. 1976), Peter Stettenheim (ca. 1954), Charles Utermohle (ca. 1973), and by personnel of the U.S.

Fish and Wildlife Service's Yukon-Kuskokwim Refuge (ca. 1970–1990s). The results of the previous investigations have been incorporated here in order to provide a comprehensive summary of Nuniwarmiut plant use. The location of earlier Nunivak botanical collections include Hultén, State Museum of Natural History, Stockholm; Lantis, University of California Herbarium, Berkeley; Fries, Middlebury College, Vermont; Stettenheim, Michigan State University, East Lansing; Utermohle, University of Alaska Museum Herbarium, Fairbanks; and the Alaska U.S. F&WS, Y-K Delta Refuge herbarium, Bethel.

Data from published and unpublished reports on Native use of indigenous species on mainland Alaska is relatively sparse but has been incorporated here to provide a more regional perspective. No effort has been made to validate information found in these earlier sources. The absence of comparative data for many of the included species is thought to be due to the lack of effort to record such data in the past and has little relationship to the actual Native knowledge of local flora and shellfish. For example, information on the use of specific species of shellfish or sea invertebrates was not found for mainland coastal Native populations, but general references to a more universal consumption of marine species can be found for the Nelson Island Yup'ik (e.g., clams and mussels: Fienup-Riordan 1983:92); Pacific Eskimo (e.g., sea urchins, periwinkles, clams, blue mussels, and chitons: Clark 1984:190), Aleut (e.g., sea urchins, clams, limpets, and mussels: Lantis 1984:175), and to the east with the Inuit of Quebec (e.g., sea urchins, mussels and sea cucumbers: Saladin D'Anglure 1984:487) and west Greenland (e.g., seaweed and mussels: Kleivan 1984:608).

Eskimoan people¹ in the western coastal region of Alaska are largely divided into two linguistic groups, the Yupik and Inuit-Inupiaq (Woodbury 1984). Yupik languages were spoken aboriginally on Alaska's west coast with Siberian Yupik spoken on the coasts of the Chukchi Peninsula in Siberia; Central Yup'ik was spoken in Alaska from Norton Sound south to the Alaska Peninsula and east along the Pacific Ocean to Prince William Sound (see Fig. 1). Inuit-Inupiaq was spoken north from Norton Sound and east across Arctic Alaska and Canada to the coasts of Labrador and Greenland (see Anderson 1939; Jones 1983; and Nickerson et al. 1973 for ethnobotanic information for the Inuit-Inupiaq portion of Alaska). This

1. The Aleut occupy the southern tip of the Alaska Peninsula and the Aleutian Islands. Their use of indigenous flora is not discussed in this paper (see Bank 1953).

paper focuses on the ethnobotany of the Yup'ik Eskimo in southwestern Alaska, an area historically dominated by the Yukon-Kuskokwim Delta but which also includes Nunivak and Nelson islands and Bristol Bay. Athabascan-speaking peoples largely inhabit the interior. While not addressed in this article, the ethnobiology of this interior region can be found in Carroll (1972), Fortune (1988), Garibaldi (1999), and Kari (1987).

REGIONAL SETTING

The Yukon-Kuskokwim Delta and Nunivak Island (Fig. 3) encompass an area of almost 81 million kilometers (31,250 square miles) or 8.1 million hectares (20 million acres). This delta region consists of a vast and largely roadless expanse of low-lying tundra. Native villages are predominantly located along the area's coast and major waterways, with development largely limited to commercial fishing. The degree of early contact between cultural

groups within the delta cannot accurately be determined due to conflicting early historical data and later movements of peoples throughout the region, but villages are known to have been linked by extensive trade networks, intermarriage, and alliances during times of warfare (VanStone 1984:224). Ponds, lakes, streams, and sloughs, which make travel throughout southwestern Alaska extremely difficult, cover half of the Yukon-Kuskokwim Delta. Not surprisingly, the immense wetlands provide suitable habitat for millions of waterfowl, small and large mammals, and abundant flora. The seasonal harvest of marine mammals (e.g., seals, sea lion, walrus) and many species of fish (particularly salmon, halibut, whitefish, and blackfish) remains vital for local survival.

The delta has a subarctic maritime climate, influenced by the surrounding sea, which produces a relatively stable temperature. Summers are generally cool and windy, with some areas experiencing frequent fog; winters are cold with both wet and dry periods. The region's mean annual temperature is -20°C (3°F) with mean daily temperatures ranging from -25°C (-20°F) in January and February to 10°C (50°F) in August (Selkregg 1976; Swanson et al. 1986). Rain and snowfall is heavier on the mainland than neighboring islands (e.g., Nunivak), with islands experiencing more frequent overcast days with dense fogs. This difference between mainland and island areas is due to the greater effect of the Bering Sea on the island environment. Precipitation is moderate with a mean annual rainfall of 40.6 cm (16 inches) and snowfall of 127 cm (50 inches).

The Yup'ik Eskimo traditionally practiced a hunting, fishing, and gathering subsistence economy that revolved predominantly around the harvest of the above-mentioned species, in addition to the numerous plant species that were critically important to survival. Hultén (1966, 1968) has studied the vascular flora of the Yukon-Kuskokwim Delta and Bos (1967) and Palmer and Rouse (1945) that of Nunivak Island. The region's vegetation is predominantly arctic tundra containing a variety of lichens, grasses, sedges, flowers, and shrubs. It is similar to vegetation found throughout western and northwestern Alaska. The tallest tundra plants are shrubby willows that can reach up to eight feet in height along some river courses. Major vegetation types include wet tundra, dry tundra, alpine tundra, and grass-browse (i.e., grass hummock and beach grass-forb). Wet tundra is most prevalent along the coast in poorly drained areas, with the dominant cover species consisting of sedges (*Carex* spp.), cottongrass (*Eriophorum* spp.), willow (*Salix* spp.), crowberry (*Empetrum nigrum*),

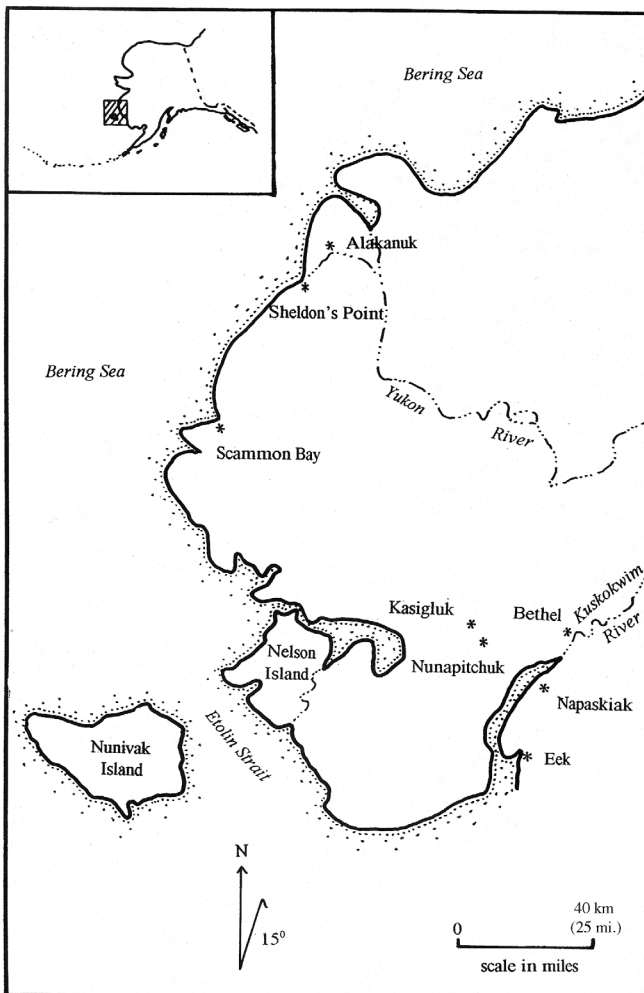


Figure 3. Map of Yukon-Kuskokwim Delta.

and various species of mosses and lichens (e.g., *Sphagnum*, *Pohlia*, and *Cladonia*). Dry tundra is found on areas of sloping terrain having good drainage and is dominated by species similar to those found in wet tundra areas, in addition to bearberry (*Arctostaphylos alpina*), Labrador tea (*Ledum palustre decumbens*), woodrush (*Luzula nivalis*), bog blueberry (*Vaccinium uliginosum*) and dwarf birch (*Betula nana exilis*). Alpine tundra, found at higher elevations on hills and mountains, is similar to that in dry tundra areas and is dominated by crowberry, alpine bearberry, Labrador tea, white mountain-avens (*Dryas octopetala*), and moss. Grass-browse is generally found interspersed with the dry tundra subtype and along edges of streams and rivers adapted to periodic flooding. This vegetation type is dominated by fescue (*Festuca* spp.), bluejoint (*Calamagrostis canadensis*), willow, lichens, sedge, wild celery, and seacoast angelica (*Angelica lucida*).

USE OF INDIGENOUS FLORA

Indigenous plants were an integral part of the year-round diet of Eskimo people in addition to their incorporation in other facets of their lives. Contrary to the popular perception of Eskimo people surviving solely on fish and meat, they utilized a large number of local plants for food, medicinal, and utilitarian purposes. An earlier Alaska study estimated that up to 15% of the diet of western Eskimo people (Kotzebue to Alaska Peninsula) is made up of vegetable resources (Young and Hall 1969:43). While plant resources remained sparse on some offshore islands such as St. Lawrence (Young 1971; Young and Hall 1969), on Nunivak and Nelson islands they provided a significant addition to the Natives' diet.

Knowledge of the Native use of indigenous flora in the delta remains limited. Previous ethnobotanical studies are limited to research on Nunivak Island (Fries 1977; Griffin 2001, 2004, 2007; Lantis 1946, 1959; Nuniwarmiut Taqnelluit n.d.), Nelson Island (Ager 1982; Ager and Ager 1980), the Kuskokwim villages of Napaskiak (Oswalt 1957), Eek, Kasigluk, and Nunapitchuk (Andrews 1989; Lantis 1958, 1959), several lower Yukon Delta and coastal villages (e.g., Alakanuk, Sheldon's Point, Scammon Bay) by Fienup-Riordan (1986) and a more regional study by Alix and Brewster (2004). St. Lawrence Island and the Chukchi coastal area of Siberia are similar in landform to southwestern Alaska in that lands are covered by low-lying arctic tundra, although the number and variety of plant species differ between areas. Knowledge of the in-

digenuous use of plants in these areas remains limited to two published and unpublished accounts (Young and Hall 1969 and Ainana and Zagrebin n.d., respectively). Ethnobotanical knowledge among Pacific Yupik speakers is largely limited to studies among the Chugach (Birket-Smith 1953; Fortuine 1988; Wennekens 1985) in Prince William Sound, Kodiak Island (Graham 1985), and the Alaska Peninsula (Morseth 2003). Since the flora of the first two of these areas is very different from that of the Yukon-Kuskokwim Delta and Nunivak Island (i.e., forest vs. tundra), only information on the use of similar plant species is addressed here. Several recent regional publications have attempted to summarize knowledge of the indigenous use of plants throughout Alaska (e.g., Biggs 1999; Garibaldi 1999; Schofield 1989); however, the Yupik-speaking areas remain poorly documented.

Limited data are available on the use of marine plant and shellfish resources in the study area. Previous studies in the region have largely ignored such use. As a result of the collaboration between the author and Nunivak people, data on the traditional use of nine indigenous marine plant and invertebrate species and sixteen shellfish species have been identified. These data has been incorporated in the following tables.

Table 1 provides a list of the seasonal use of indigenous plants, marine invertebrates, and shellfish that were used for food by the Yup'ik Eskimo. This index provides data on the Yup'ik use of seventy-one indigenous species in southwestern Alaska, which includes forty-five terrestrial plant species, ten marine plants and invertebrates, and sixteen shellfish species. In Table 1, species are arranged in alphabetical order by each species' scientific name. Details regarding season of harvest, part used, and if the species was stored for winter consumption/use are provided. In addition, the known range and extent of use of each species among Eskimo peoples is included.

Medicinal knowledge of indigenous plants varies from area to area, with twenty-eight plant species used in the Yukon-Kuskokwim Delta and Nunivak Island. Table 2 provides a list of medicinally used plants in the region, along with references to texts that provide greater detail on the collection, processing, and application of each species.

In addition to the use of plants for food and medicine, many indigenous species were used for a variety of utilitarian purposes. Table 3 provides details on twenty-eight species used in southwestern Alaska, including twenty-six terrestrial and two marine species. Name, season of harvest, and specific use are included.

Table 1: Seasonal use of indigenous food plants and shellfish among Yup'ik-speaking Eskimo.

Terrestrial Plants					Region*
Scientific Name	Common Name	Season	Plant Part	Storage	
<i>Angelica lucida</i>	Wild celery	Su	leaves, stalk, root	X	Y-K Delta, Seward Pen., PWS/LKP, Chukotka, Nunivak
<i>Arctostaphylos alpina</i>	Alpine bearberry	Su, F	fruit		Y-K Delta, Seward Pen., Nunivak
<i>Boltenia ovifera</i>	Sea potato, Sea onion	S, Su	bulb		Nunivak
<i>Caltha palustris</i>	Marsh marigold	W, S	entire plant	X	Y-K Delta, Nunivak
<i>Carex</i> spp.	Sedges	F	root, stem		Nunivak
<i>Cladonia</i> spp.	Lichens	S	entire plant		Nunivak
<i>Claytonia tuberosa</i>	Wild potato, Tuberous spring-beauty	Su	corm		Y-K Delta, Chukotka, Nunivak
<i>Conioselinum chinense</i>	Western hemlock-parsley	S, Su	root		PWS/LKP, Nunivak
<i>Draba hyperborea</i>	Wild lettuce	S, Su	leaves	X	Nunivak
<i>Dryopteris dilatata</i>	Shield fern	Su, F	fronds, fiddleheads		Nunivak
<i>Empetrum nigrum</i>	Crowberry	Su, F	fruit, plant	X	Y-K Delta, Seward Pen., PWS/LKP, Chukotka, Nunivak
<i>Epilobium angustifolium</i>	Tall fireweed	S, Su	leaves,	X	Y-K Delta, Nunivak
		S	young shoots		PWS/LKP, Seward Pen.
<i>Epilobium latifolium</i>	Dwarf fireweed	Su	leaves, young shoots	X	Nunivak
<i>Equisetum arvense</i>	Common horsetail	S, Su	roots, nodules on roots		Kuskokwim Delta, Nunivak
<i>Eriophorum angustifolium</i>	Tall cottongrass	Su, F	base of stem, greens, roots		Y-K Delta, Seward Pen., Nunivak
<i>Fucus</i> spp.	Bladderwrack	year round	plant,		Y-K Delta, Nunivak
<i>F. Gardneri</i>	Rockweed	S, Su, F	young plant		PWS/LKP
<i>Hippuris tetraphylla</i> or <i>H. vulgaris</i>	Mare's tail	S, F	leaves, stems, roots	X	Y-K Delta, Nunivak
<i>Honckenya peploides</i>	Beach greens, Seabeach sandwort	S, Su	leaves, stems	X	Y-K Delta, Chukotka, Seward Pen., Nunivak
<i>Ledum palustre</i>	Labrador tea	year round	leaves		Y-K Delta, Seward Pen., PWS/LKP, Nunivak
<i>Lingusticum scoticum</i>	Beach lovage, Wild parsnip	S, Su	roots, leaves, stems		Y-K Delta, Seward Pen., Nunivak
<i>Lycoperdon</i> spp.	Puffballs	?	fruit		Chukotka
<i>Mertensia maritima</i>	Oysterleaf	S, Su	leaves, stems		Kuskokwim Delta, Nunivak
<i>Nephroma arcticum</i>	Arctic kidney lichen	S, Su, F	lichen		Nunivak
<i>Oxycoccus microcarpus</i>	Bog cranberry	Su	berries		Nunivak
<i>Oxyria digyna</i>	Mountain sorrel	S, Su	leaves	X	Kuskokwim Delta, Chukotka, Seward Pen., Nunivak
<i>Parrya nudicaulis</i> (?)	Wild cabbage/celery	Su	leaves	X	Nunivak
<i>Pedicularis verticillata</i>	Woolly lousewort	S	flowers, roots		Y-K Delta, Chukotka, Seward Pen., Nunivak
<i>Pohlia nutans/Webera nutans</i>	Moss	S	plant		Y-K Delta, Nunivak
<i>Polygonum alaskanum</i>	Alaska rhubarb	S, Su	leaves		Yukon Delta, Nunivak
<i>Polygonum bistorta</i>	Pink plumes, Bistort	S, F	leaves, root stalk	X	Chukotka, Seward Pen., Alaska Pen., Nunivak
<i>Polygonum viviparum</i>	Alpine bistort, Wild rhubarb	S, Su	rhizome, bud, leaves, root		Y-K Delta, Chukotka, Nunivak
<i>Ranunculus Pallasii</i>	Pallas buttercup	S, Su	leaves, stems		Y-K Delta, Nunivak
<i>Rhodymenia palmata</i>	Red seaweed, Dulse	year round	plant		Y-K Delta, PWS/LKP, Nunivak
<i>Rubus arcticus</i>	Nagoonberry	Su	fruit	X	Y-K Delta, PWS/LKP, Seward Pen., Nunivak
<i>Rubus chamaemorus</i>	Cloudberry	Su	fruit	X	Y-K Delta, Chukotka, PWS/LKP, Seward Pen., Nunivak
<i>Rumex arcticus</i>	Dock, sourdock	S, Su	leaves, stems	X	Y-K Delta, Ak. Pen., PWS/LKP, Nunivak

Table 1 (continued)

Terrestrial Plants					
Scientific Name	Common Name	Season	Plant Part	Storage	Region*
<i>Salix alaxensis</i>	Alaska willow	S, Su	catkins, leaf top		Y-K Delta, Seward Pen., Nunivak
<i>Salix pulchra</i>	Diamondleaf willow	Su	catkins, leaves		Y-K Delta, Chukotka, Nunivak
<i>Saxifraga</i> spp.	Saxifrages	S, Su, F	leaves	X	Chukotka, Seward Pen., Nunivak
<i>Sedum rosea</i>	Roseroot, Stonecrop	S, Su, F	flowers, stalk, root		Y-K Delta, Chukotka, Seward Pen., Nunivak
<i>Senecio pseudo-arnica</i>	Ragwort, Fleabane	Su	leaves, stems, top of shoot	X	Y-K Delta, Nunivak
<i>Streptopus amplexifolius</i>	Twisted stalk	Su	berries		Nunivak
<i>Vaccinium uliginosum</i>	Alpine blueberry	Su	berries		Y-K Delta, Chukotka, Seward Pen., Nunivak
<i>Vaccinium vitis-idaea</i>	Low-bush cranberry	Su	berries		Y-K Delta, Chukotka, Seward Pen., Nunivak
Marine Plants and Invertebrates					
Scientific Name	Common Name	Season	Part	Storage	Region*
<i>Abarenicola pacifica</i>	Pacific lugworm	S	body		Nunivak
<i>Anthopleura</i> spp.	Sea anemone	S, Su	body		Nunivak
<i>A. artemesia</i>	Sea anemone	S, Su	body		Nunivak
<i>Boltenia ovifera</i>	Sea potato, Sea onion	when available	bulb		Nunivak
<i>Cucumaria miniata</i>	Sea cucumber	when available	body		Nunivak
<i>Dendrodoa</i> spp.		when available	branches		Nunivak
<i>Epiactis</i> spp.	Sea anemone	S, Su	body		Nunivak
<i>Fucus gardneri</i>	Bladderwrack	year round	plant		Nunivak
<i>Palmaria palmata</i>	Dulse, Seaweed	year round	plant		Nunivak
<i>Urticina crassicornis</i>	Christmas anemone	S, Su	body		Nunivak
Shellfish					
Scientific Name	Common Name	Season	Part	Storage	Region*
<i>Clinocardium nuttallii</i>	Nuttall's cockle	S, Su	meat		Nunivak
<i>Dendraster excentricus</i>	Sand dollar	S, Su	meat		Nunivak
<i>Glycymeris subobsoleta</i>	West Coast bittersweet clam	S, Su	meat		Nunivak
<i>Littorina sitkana</i>	Periwinkle	S, Su	meat		Nunivak
<i>Macoma calcarea</i>	Chalky macoma	S, Su	meat		Nunivak
<i>Modiolus modiolus</i>	Horse mussel	S, Su	meat		Nunivak
<i>Mytilus edulis</i>	Blue mussel	S, Su	meat		Nunivak
<i>Natica clausa</i>	Arctic natica	S, Su	meat		Nunivak
<i>Nucella lamellosa</i>	Friiled periwinkle	S, Su	meat		Nunivak
<i>Pandalus borealis</i>	Pink shrimp	when available	meat		Nunivak
<i>Paralithodes camschatica</i>	King crab	S, Su	meat		Nunivak
<i>Protothaca staminea</i>	Pacific littleneck	S, Su	meat		Nunivak
<i>Siliqua patula</i>	Razor clam	S, Su	meat		Nunivak
<i>Spisula polynyma</i>	Stimpson's surf clam	S, Su	meat		Nunivak
<i>Telmessus cheiragonus</i>	Helmet crab	S	meat		Nunivak
<i>Tonicella</i> spp. (?)	possible chiton	F	meat		Nunivak

Season Abbreviations: S = Spring; Su = Summer; F = Fall; W = Winter

Location Abbreviations: Y-K Delta = Yukon-Kuskokwim Delta, PWS/LKP = Prince William Sound and Lower Kenai Peninsula

All plants are used on Nunivak Island unless otherwise noted.

Nunivak information largely extracted from oral history interviews conducted by author (except where noted by Lantis [1958, 1959] and Nowak [1975]). Mainland data obtained from published texts.

Table 2: Medicinal plant use among Yup'ik-speaking Eskimo.

Scientific name	Common name	Plant part	Plant application	Symptom	Location*	Reference**
<i>Achillea</i> spp.	Yarrow	Leaves, stem	Infusion, gargle, poultice, chew, switch	Congestion, sore throat, boils, arthritis, uriner evacuation, increase milk after parturition	Nunivak, PWS/LKP, N. Bering Sea	Anderson 1939; Fortuine 1985; Morseth 2003; Schofield 1989; Wennekens 1985
<i>Alnus</i> spp.	Alder	Leaves, bark, branch	Poultice, switch	Cut/scrapes, arthritis, sore muscles, stool softner	Y-K Delta, PWS/LKP	Ager and Ager 1980; Garibaldi 1999; Morseth 2003; Wennekens 1985
<i>Angelica</i> spp.	Wild celery	Root, stem	Chew, infusion, switch	General ill health, seasickness remedy, sore joints	Yukon Delta, SLI	Anderson 1939; Garibaldi 1999; Hultén 1968; Jones 1983; Morseth 2003; Oswalt 1957; Young and Hall 1969
<i>Artemisia</i> <i>Tillessi</i>	Stinkweed, Wormwood	Leaves, branch, seed head, plant	Poultice, switch, infusion/decoction, hair rinse, vapor, chew	Cuts, dandruff, sore muscles, arthritis, stomach trouble, constipation, bleeding, asthma	Nunivak, SLI, Y-K Delta, PWS/LKP	Ager 1982; Ager and Ager 1980; Fienup-Riordan 1986; Garibaldi 1999; Griffin 2001, Lantis 1959; Oswalt 1957; Overfield et al. 1980; Wennekens 1985; Young and Hall 1969
<i>A. vulgaris</i>	Stinkweed	Leaves	Poultice	Sore joints, gas pains	Nunivak, Norton Sound	Garibaldi 1999; Griffin 2001; Lantis 1958
<i>Betula nana exilis</i>	Dwarf birch	Leaves	Infusion/decoction	Boiled for stomach or intestinal problems	Nunivak, K. Delta	Griffin 2001; Lantis 1958, 1959
<i>Caltha palustris</i>	Marsh marigold	Leaves	Infusion/decoction, chew	Constipation, diarrhea	K. Delta	Garibaldi 1999; Lantis 1959
<i>Dryopteris australica</i>	Shield fern	Fronds	Infusion/decoction	Boiled for stomach problems, intestinal	Nunivak, K. Delta	Griffin 2001; Lantis 1958, 1959
<i>D. dilatata americana</i>	Wood fern	Plant	Infusion/decoction	Stomach trouble	K. Delta	Garibaldi 1999
<i>Epilobium angustifolium</i>	Tall fireweed	Leaves, root	Infusion/decoction, poultice	Boiled for stomach or intestinal, constipation, cuts	Nunivak, K. Delta, PWS/LKP	Ager 1982; Ager and Ager 1980; Garibaldi 1999; Griffin 2001; Lantis 1958, 1959; Wennekens 1985
<i>Equisetum</i> spp., <i>E. avense</i>	Horsetail	Upper stem, plant	Infusion/decoction, poultice	Internal bleeding, hemorrhages, pimples	Y-K Delta, PWS/LKP	Ager 1982; Ager and Ager 1980; Garibaldi 1999; Wennekens 1985
<i>Eriophorum</i> spp.	Cottongrass	Flower, cotton, stem, leaves	Chew, poultice	Cuts/scrapes, ill health, sores, inflamed eyes, boils	Nunivak, K. Delta	Garibaldi 1999; Griffin 2001; Lantis 1959; Oswalt 1957
<i>Fomes igniarius</i>	Chew ash fungus	Fungus	Infusion/decoction	Constipation, stomach trouble	K. Delta	Garibaldi 1999; Lantis 1959
<i>Ledum palustre</i>	Labrador tea	Leaves, stems	Infusion/decoction, incense	Constipation, stomach trouble, colds, TB, cure to drive out ghosts	Y-K Delta, PWS/LKP	Ager 1982; Ager and Ager 1980; Andrews 1989; Fienup-Riordan 1986; Jones 1983; Oswalt 1957
<i>Matricaria matricarioides</i>	Pineapple weed, Arctic chamomile, False chamomile	Leaves	Infusion	Stomach gas and disorders, laxative, nursing mothers	Aleutians, Kenai, Y-K Delta	Ager 1982; Bank 1953; Kari 1987; Schofield 1989; Smith 1973
<i>Nephroma arcticum</i>	Arctic kidney lichen	Plant	Infusion	Ill health	Y-K Delta	Garibaldi 1999; Oswalt 1957

Table 2 (continued)

Scientific name	Common name	Plant part	Plant application	Symptom	Location*	Reference**
<i>Oxyococcus microcarpus</i>	Bog cranberry	Fruit	Chew	Pneumonia, stomach trouble	Y-K Delta	Garibaldi 1999
<i>Petasites frigidus</i>	Coltsfoot	Stalk, root	Infusion	Colds	Nunivak, Siberia, PWS/LKP, Kenai	Griffin 2007; Hultén 1968; Kari 1987; Nuniarmiut Taqnelluit n.d.; Wennekens 1985
<i>Phellinus igniarius</i>	forest fungi, Punk	fungus ash	Ashes mixed with tobacco - chew	Euphoric; increase nicotine delivery	Y-K Delta	Blanchette 2001; Blanchette et al. 2002; Pruffer 2001
<i>Picea glauca</i>	White spruce	Needles, gum	Infusion/decoction, chew, salve	Cit/scrapes, cough, chest congestion	Y-K Delta	Garibaldi 1999; Lantis 1959; Oswalt 1957
<i>Rubus chamaemorus</i>	Cloudberry	Fruit	Chew	Diarrhea, skin trouble	Nunivak, K. Delta	Garibaldi 1999; Griffin 2001; Lantis 1959; Schofield 1989
<i>Rumex</i> spp.	Dock	Leaves, root	Chew, snuff, poultice; infusion/decoction	Diarrhea, constipation, headache, chill fever	PWS/LKP, Napaskiak, Y-K Delta	Ager 1982; Birket-Smith 1953; Garibaldi 1999; Morseth 2003; Oswalt 1957; Wennekens 1985
<i>Salix</i> spp.	Willow	Leaves, inner and outer bark, catkins, cambium	Infusion/decoction, chew, gargle, poultice	Lung hemorrhage, pain, sore throat or mouth, skin sores, cut/scrapes, eye trouble	Y-K Delta	Ager 1982; Ager and Ager 1980; Garibaldi 1999; Griffin 2001; Lantis 1958, 1959; Oswalt 1957; Wennekens 1985
<i>S. pulchra</i>	Diamondleaf willow	Leaves	Chew	Sore mouth	Nunivak, Y-K Delta	Ager 1982; Griffin 2001
<i>Sedum rosea</i>	Roseroot, Stonecrop	Leaves, flower, root	Infusion/decoction, chew	Boiled for stomach prob., intestinal, sore mouth, TB	Nunivak, K. Delta, NI	Ager 1982; Ager and Ager 1980; Garibaldi 1999; Griffin 2001; Lantis 1958
<i>Sphagnum</i> spp.	Sphagnum	Moss	Chew, poultice	Diarrhea, cuts/scrapes	K. Delta	Fortuine 1985; Garibaldi 1999; Lantis 1959
<i>Vaccinium vitis-idaea</i>	Low-bush cranberry	Fruit	Chew, poultice	Diarrhea, eye trouble	K. Delta	Garibaldi 1999; Lantis 1959
<i>Valeriana</i> spp.	Valerian	unknown	unknown	Stomach trouble, good luck	Y. Delta; SLI	Garibaldi 1999; Young and Hall 1969

* Location abbreviations: Y Delta = Yukon Delta; K Delta = Kuskokwim Delta; NI = Nelson Island; SLI = St. Lawrence Island

** Medicinal reference data taken from published sources. Griffin data are derived from elder interviews conducted by author on Nunivak Island.

Table 3: Utilitarian use of indigenous plants and shellfish by Yup'ik-speaking Eskimo.

Terrestrial Plants					Location*
Scientific Name	Common Name	Season	Plant Part	Purpose	
<i>Aconitum delphinifolium</i>	Monkshood	Year round	root	hunting poison	Nunivak, PWS/LKP
<i>Alnus</i> spp.	Alder	S, Su, F	wood	firewood	Nunivak
<i>Angelica lucida</i>	Wild celery		root	amulet to ward off polar bear	Siberia
<i>Betula</i> spp.	Birch bracket fungus	Year round	bark, limbs	firestarter, snowshoes, canoes, containers	Nunivak, Y-K Delta
<i>Betula papyrifera</i>	Paper birch	S, Su, F	bark	firestarter, smudge	Nunivak
<i>Carex</i> spp.	Sedges	F	grass	boot lining, socks	Nunivak, Y-K Delta
<i>Cladonia rangiferina</i>	Lichens, Reindeer moss	Year round	plant	seal oil applicator	Nunivak, Y-K Delta
<i>Elymus mollis</i>	Wild rye grass	S, Su, F	grass	menstrual pad, baskets	Nunivak, Y-K Delta
				roof thatching, mats	PWS/LKP
<i>Empetrum nigrum</i>	Crowberry	Su, F	leaves	storage pit liner	Nunivak, Y-K Delta
<i>Equisetum arvense</i>	Common horsetail	S, Su, F	stems	play matches for child	Nunivak, Y-K Delta
<i>Eriophorum</i> spp.	Cottongrass	Su, F	stems	boot soles	Nunivak, K Delta
<i>Eriophorum angustifolium</i>	Tall cottongrass		reeds, stems	basket, mat	Nunivak, K Delta
<i>Fomes pinicola</i>	Fungi		fungus	added to tobacco and snuff	Nunivak, Y-K Delta
<i>Larix laricina</i>	Larch	Year round	tree	bows, arrows, paddles	Y-K Delta
<i>Matricaria matricarioides</i>	Pineapple weed, Arctic chamomile	S, Su, F	leaves, bud	clean honey bucket of smell	Nunivak
<i>Petasites</i> spp.	Compositae			added to tobacco and snuff	Y-K Delta
<i>Petasites frigidus</i>	Coltsfoot	Su, F	leaves	berry basket	Nunivak,
<i>Phellinus igniarius</i>	Birch bracket fungus	S, Su, F	fungus	formerly used for fires, now mix ash w/chewing tobacco	Nunivak, Y-K Delta
<i>Picea mariana</i>	Black spruce	S, Su, F	wood	firewood, harpoon shafts	Y-K Delta
<i>Poa</i> spp.	Blue grass	F	grass	boot lining, diapers	Nunivak, Y-K Delta
<i>Pohlia nutans, Webera nutans</i>	Moss	S, Su, F	plant	diaper, basket-lining, fire starter, pottery pad	Nunivak, Y-K Delta, PWS/LKP
<i>Populus balsamifera</i>	Cottonwood	S, Su, F	wood	steam fish, firewood	Y-K Delta
<i>Rumex arcticus</i>	Sourdock	Su, F	plant	navigation aid, cache pit lining, landmark	Nunivak, K Delta
<i>Salix</i> spp.	Willow	S, Su, F	wood	firewood, harpoon shafts	Nunivak, Y-K Delta
<i>Spahagnum</i> spp.	Sphagnum moss	Year round	moss	menstrual pad, diaper, lamp wick	Nunivak, Y-K Delta
<i>Valeriana capitata</i>	Valerian	Su, F	leaves	clean nets of fish smell	Nunivak, Y Delta
Shellfish					
<i>Denraster excentricus</i>	Sand dollar	S, Su, F	sand dollar	whistle	Nunivak
<i>Modiolus modiolus</i>	Horse mussel	S, Su	shell	scraper for sea mammal intestines	Nunivak

Season Abbreviations: S = Spring; Su = Summer; F = Fall; W = Winter

Location Abbreviations: K Delta = Kuskokwim Delta; Y Delta = Yukon Delta; Y-K Delta = Yukon-Kuskokwim Delta; PWS/LKP = Prince William Sound and Lower Kenai Peninsula.

Sources: Nunivak data collected from elder interviews. Data from other areas obtained from published references.

NATIVE PLANT TAXONOMY

An examination of general Yup'ik terms (Jacobson 1984) provides comparative data useful in identifying linguistic distinctions made in Yup'ik plant taxonomies. Yup'ik speakers (including Cup'ig speakers on Nunivak Island who speak the most divergent dialect within the Yup'ik branch) tend to divide plants into basic groups based on how plants were traditionally used, their similarity in appearance, or physical characteristics. For example, on Nunivak, the Cup'ig plant name *ciwassit*² translates to 'wild greens that can be cooked' and is used to denote several distinct species that are prepared in a similar manner (i.e., *Rumex arcticus* [sour dock], *Polygonum bistorta* [bistort], and *P. viviparum* [alpine bistort]). *Kumarutet* is used to denote all moss species (e.g., *Pohlia nutans*) based on the traditional use of moss as a wick in lamps (*kuman* = lamp, light). Examples of plants grouped by similarity in appearance, characteristics, or setting include (1) *elquat*: term used to designate several varieties of seaweed (e.g., *Palmaria palmata* [dulse], *Fucus* spp. [bladderwrack]); (2) *meqtat neq-iat*: meaning bumble bee food for several local plant species (e.g., *Pedicularis verticillata* [wooly lousewort], *Sedum rosea* [roseroot]); and (3) *agyam an'a(i)*: used for all puffball species (*Lycoperdon* spp. and *Calvatia* spp.) In Yup'ik, *agyam ana* translates to meteor and meteors, which are traditionally said to turn into puffballs when they land (Jacobson 1984:48). Still other plant names highlight distinctions within a genus such as *qugyuguat*, which is used to refer to all *Salix* (willow) species except those exhibiting catkins, which are referred to as *qimugkararat*. Further analysis is needed in order to fully understand the Yup'ik concept and categorization of local flora.

Some plant uses and names are shared by Yup'ik, Cup'ig, and Inupiaq speakers (i.e., Seward Peninsula) to the north has been identified. Similarities between some Yup'ik, Cup'ig, and Inupiaq plant names (e.g., *kavlak – kavlag – kavlaq* [*Arctostaphylos alpina* or alpine bearberry], *paunraq – paunrat – paungaq* [*Empetrum nigrum*, crowberry], *pekneq – pekner – pikneq* [*Eriophorum angustifolium*, cottongrass], *tukaayug – tuk'ayut – tukaayuk* [*Linguisticum scoticum*, lovage]) and food preparations (e.g., *akutaq – akutar – akutuq* [Eskimo ice-cream comprised of berries, seal oil, reindeer tallow or Crisco, snow and sometimes salmon eggs]) highlight extended contact between western Alaska peoples over time. Further research

is needed to evaluate the degree of sharing between these language branches with regard to the recognition and use of indigenous plants. See Table 4 for a glossary of Native names for all identified indigenous terrestrial and marine plant species, marine invertebrates and shellfish, and Table 5 for specific information on marine resource use.

PLANT HARVEST, PREPARATION, AND STORAGE

In the Yukon-Kuskokwim Delta and on Nunivak Island, women and children traditionally gathered most indigenous plants while the men were harvesting other available resources (e.g., caribou, waterfowl, seal) (Fienup-Riordan 1983; Lantis 1946). While fresh spring greens provided a welcome addition to the diet, which in winter was based largely on dried and stored foods, other greens were harvested throughout the year as they ripened and used with some of those stored for winter use. With the melting of the snow pack, local greens and berries not picked during the previous fall's harvest begin to appear and were added to the local diet. Depending on the timing of break up, Yup'ik families began to move to their spring camps to harvest available resources. Along the coast, Yup'ik men would journey out along the ice to harvest arriving sea mammals (seals, walrus) while women would spend much of their time harvesting available plant resources (greens and seaweeds) and shellfish. Early harvestable spring food plants included marsh marigold (*Caltha palustris*), sour dock (*Rumex arcticus*), wild celery (*Angelica lucida*), wild lettuce (*Draba hyperborea*), wild parsnip (*Ligusticum Hultenii*), wild rhubarb (*Polygonum viviparum*), mountain sorrel (*Oxyria digyna*), Pallas buttercup (*Ranunculus Pallasii*), and Labrador tea (*Ledum palustre*).

After the completion of the spring hunting season, families would move to summer fish camps. Fish comprised the most prolific and essential subsistence resource for many Alaska Natives living in southwestern Alaska, and their harvest would occupy the majority of the families' efforts for several months. Traditional indigenous plants would continue to be harvested as they ripened and were eaten fresh or placed in underground caches for temporary storage. By late summer/early fall, several berry species (e.g., cloudberry [*Rubus chamaemorus*], nagoonberry [*R. arcticus*], crowberry [*Empetrum nigrum*]) and local greens (e.g., sourdock [*Rumex arcticus*]) were ready to be

2. A glossary of Yupik and Cup'ig plant names is included in Table 4.

Table 4: Glossary of Yup'ik names for indigenous plants, invertebrates, and shellfish.

Terrestrial Plants					
Scientific Name	Common Name	Yup'ik	Cup'ig	Siberian Yupik	Inupiaq
<i>Achillea</i> spp.	Yarrow	<i>punaiyulinu'kait</i>			
<i>Aconitum delphinifolium</i>	Monkshood		<i>cetegnæg</i>		
<i>Alnus</i> spp.	Alder	<i>cuukvaguaq;</i> <i>chufu'koak</i> ¹			
<i>Angelica lucida</i>	Wild celery	<i>ikiituk</i>	<i>ik'itut, ik'iituq,</i> <i>ik'iitug</i>		<i>ikuusuk</i>
<i>Arctostaphylos alpina</i>	Alpine bearberry	<i>kavlak, kavlagpak</i>	<i>kavlag, kavla, kutag</i>		<i>kavlaq</i>
<i>Artemisia tilesii</i> and <i>A. vulgaris</i>	Stinkweed, Wormwood	<i>caiggluk, qanganarvaq</i>	<i>neqniallngut</i>		
<i>Betula</i> spp.	Birch	<i>kasruq, nelnguq</i>			
<i>Betula nana exilis</i>	Birch, Dwarf birch	<i>chupuaiya'hak</i>	<i>ciq'ur</i>		
<i>Betula papyrifera</i>	Birch	<i>u'linguk</i>			
<i>Caltha palustris</i>	Marsh marigold	<i>allngiguaq, irunguaq</i>	<i>wivlug</i>		
<i>Carex</i> spp.	Sedges		<i>pekneret</i>		
<i>Cladonia</i> spp.	Lichens	<i>ciruneruat</i>	<i>qelqun'at</i>		
<i>Cladonia rangiferina</i>	Reindeer lichen, Reindeer moss	<i>ciruneruat, tuntut</i> <i>neqait</i>	<i>ungagar, ungagat</i>		<i>niqaat</i> ²
<i>Claytonia tuberosa</i>	Tuberous spring-beauty	<i>ulqit, utqiq, ulqiq</i>	<i>ulpit</i>	<i>ulkik</i>	
<i>Conioselinum chinense</i>	Western hemlock-parsley		<i>tuk'ayug</i>		
<i>Cornus</i> spp.	Bunchberry	<i>cingqullektaq</i>			
<i>Draba hyperborea</i>	Wild lettuce		<i>inguqit</i>		
<i>Dryopteris austriaca</i>	Shield fern	<i>ciilavik, qecuguaq</i>	<i>centurkar, ceturqa'ar</i>		
<i>Dryopteris dilatata</i>	Shield fern	<i>ceturqaaraat, cetuguar</i>	<i>cilqaarat, ilqaarat</i>		
<i>Elymus mollis</i>	Wild rye grass	<i>taperrnaq</i>	<i>taperrnaq</i>		
<i>Empetrum nigrum</i>	Crowberry	<i>paurraq, tan'gerpak</i>	<i>paurrat, pauner</i>	<i>pagungak</i>	<i>paumbaq, paungaq</i>
<i>Epilobium angustifolium</i>	Fireweed	<i>ciiqaaq</i>	<i>cilqaar</i>		<i>quppiqutaq</i>
<i>Epilobium latifolium</i>	Dwarf fireweed, River beauty		<i>qilqaarat</i>		
<i>Equisetum arvense</i>	Common horsetail	<i>qetgoq, qetek</i>	<i>kenret</i>		
<i>Eriophorum</i> spp.	Cottongrass	<i>melquruuq</i>	<i>melqiuwet, pal'it</i>		
<i>Eriophorum angustifolium</i>	Tall cottongrass	<i>anlleg, iitaq</i>	<i>pekner</i>		<i>pikneq</i> *
<i>Fomes igniarius</i>	Chew ash fungus	<i>kuma'hak</i>			
<i>Fomes pinicola</i>	Fungi	<i>iqmik</i>			
<i>Hippuris tetraphylla</i>	Mare's tail	<i>tayaruaq</i>	<i>tayarut</i>		
<i>Honckenya peploides</i>	Beach greens	<i>qelquayak, teptuyak</i>	<i>tukulleg'at</i>	<i>mytknagrak</i>	
<i>Larix laricina</i>	Larch	<i>elriguq</i>			
<i>Ledum palustre</i>	Labrador tea	<i>ayug, ai'yut, ayu</i>	<i>ay'ut</i>		
<i>Lingusticum scoticum</i> <i>hultenii</i>	Beach lovage, Wild parsnip	<i>tukaayug, mecuqelugaq</i>	<i>tuk'ayat, ciukarrat</i>		<i>tukaaguk</i> *
<i>Lycoperdon</i> spp.	Puffballs	<i>agyam anaa</i>	<i>agyam an'a(i)</i>	<i>atykyrygak</i> ¹	
<i>Matricaria matricarioides</i>	Pineapple weed, False chamomile	<i>atsu'koak, atsarvaq,</i> <i>atsaruaq</i>			
<i>Mertensia maritima</i>	Oyster leaf		<i>civnerturpag</i>	<i>mytknagrak</i>	
<i>Nephroma arcticum</i>	Arctic kidney lichen	<i>kus'koak</i>	<i>aksarurnat</i>		
<i>Oxycoccus microcarpus</i>	Bog cranberry	<i>uingiar, tumagliq</i>	<i>tumaglir</i>		<i>qunmun</i>
<i>Oxyria digyna</i>	Mountain sorrel	<i>quunartiaraat</i>	<i>quulistar</i>	<i>kugylnik</i>	<i>qufuliq, qunulliq</i>
<i>Parrya nudicaulis</i>	Wild cabbage		<i>inguqit</i>		<i>masu aibaq</i>
<i>Pedicularis verticillata</i>	Woolly lousewort	<i>ulevleruyak</i>	<i>megtat neqiat</i>	<i>kakykak</i> ²	
<i>Petasites frigidus</i>	Coltsfoot	<i>qaltaruuaq, plugu'tuk</i>	<i>kallngagguar</i>	<i>kamgyak</i> ²	
<i>Picea glauca</i>	White spruce	<i>mingkot' moak,</i> <i>mingqutnguaq</i>			
<i>Poa</i> spp.	Bluegrass	<i>euget</i>			
<i>Poblia nutans</i>	Moss	<i>kuma'hotit</i>	<i>kumarutet, nanikiitaq</i>		
<i>Polygonum alaskanum</i>	Alaska rhubarb	<i>nakaaq</i>			<i>qusrimmak</i>

Table 4 (continued)

<i>Polygonum bistorta</i>	Bistort, Pink plumes	<i>cuassaaq, cuqlamcaq</i>	<i>ciwassat</i>	<i>siukl'iak</i>	
<i>Polygonum viviparum</i>	Alpine bistort		<i>ciwassat</i>	<i>siukl'iakyak</i>	
<i>Poria obliqua</i>	Birch bracket fungus	<i>kumakaq, ararkaq, pupiguaq</i>			
<i>Ranunculus Pallasii</i>	Pallas buttercup	<i>uivlut, kapuukar</i>	<i>uivluk, aggulunguat</i>		
<i>Rubus arcticus</i>	Nagoonberry	<i>puyuraaraq</i>	<i>puyurarag</i>		
<i>Rubus chamaemorus</i>	Cloudberry, Salmonberry	<i>atsalugpiaq, aqevsik</i>	<i>atsar atsakutag</i>	<i>akavsik</i>	<i>aqpik</i>
<i>Rumex arcticus</i>	Sourdock, Wild spinach	<i>quagciq, cuassaaq, aatunaaq</i>	<i>ciwassat, ciwassar</i>	<i>al'kyhkak</i>	<i>quabaq, quagaq</i>
<i>Salix alaxensis</i>	Alaska willow	<i>uqvigpak</i>	<i>qugyuguat</i>	<i>kukunak²</i>	
<i>Salix fuscescens</i>	Willow		<i>qimugkararat</i>		
<i>Salix pulchra</i>	Diamondleaf willow		<i>qugyuguat</i>	<i>kukunak</i>	<i>kanufiq</i>
<i>Saxifraga spp.</i>	Saxifrages		<i>quulistat</i>	<i>siknak²</i>	
<i>Sedum rosea</i>	Roseroot, Stonecrop	<i>cuqlamcaraat</i>	<i>megtat neqiat</i>	<i>nunivak</i>	
<i>Senecio pseudo-arnica</i>	Ragwort, Fleabane		<i>qugyuguat</i>		
<i>Sphagnum spp.</i>	Sphagnum moss	<i>uruq, urut</i>	<i>kumarutet, nanikiitaq</i>		
<i>Streptopus amplexifolius</i>	Twisted stalk		<i>atsarrlug</i>		
<i>Vaccinium uliginosum</i>	Alpine blueberry, Bog blueberry	<i>curaq, qiug</i>	<i>cur'at</i>	<i>siugak</i>	<i>asriavik, asiaq, subaq</i>
<i>Vaccinium vitis-idaea</i>	Lingonberry, Low-bush cranberry	<i>tumagliq, kavirliq, kitngiq</i>	<i>tumagilir, tumaglikatat</i>	<i>kitmik</i>	<i>kikmieeaq, kipmifnaq</i>
<i>Valeriana capitata</i>	Valerian	<i>teptukuyug</i>			
Marine Plants and Invertebrates					
<i>Abarenicola pacifica</i>	Pacific lugworm		<i>ussunglu</i>		
<i>Anthopleura spp.</i>	Sea anemone	<i>anarsaraq</i>	<i>et'er</i>		
<i>A. artemesia</i>	Sea anemone		<i>lagturyaqleg'et</i>		
<i>Boltenia ovifera</i>	Sea potato, sea onion		<i>arnaut</i>		
<i>Cucmaria miniata</i>	Sea cucumber	<i>uraruq</i>	<i>urwagnar</i>		
<i>Dendrodoa spp.</i>			<i>tukurnar</i>		
<i>Epiactis sp.</i>	Sea anemone		<i>qacautar</i>		
<i>Fucus gardneri</i>	Bladderwrack		<i>elquar, elquat</i>		
<i>Palmaria palmata</i>	Dulse, Seaweed		<i>elquat, elquarnar</i>		
<i>Urticina crassicornis</i>	Christmas anemone		<i>aaruyeg</i>		
Shellfish					
<i>Clinocardium nutallii</i>	Nuttall's cockle		<i>aatevtar</i>		
<i>Dendraster excentricus</i>	Sand dollar		<i>qallriucet'ar</i>		
<i>Glycymeris suboboleta</i>	West Coast bittersweet clam				
<i>Littorina sitkana</i>	Periwinkle		<i>aalemyar</i>		
<i>Macoma calcarea</i>	Chalky macoma		<i>amyagyar</i>		
<i>Modiolus modiolus</i>	Horse mussel		<i>amyagyar</i>		
<i>Mytilus edulis</i>	Blue mussel		<i>qapilat</i>		
<i>Natica clausa</i>	Arctic natica		<i>nakuunar, ka pongioq</i>		
<i>Nucella lamellosa</i>	Friiled periwinkle		<i>nakuunar</i>		
<i>Pandalus borealis</i>	Pink shrimp	<i>cungaralukvak</i>	<i>nastarnar</i>		
<i>Paralithodes camschatica</i>	King crab		<i>iwallriyar</i>		
<i>Protothaca staminea</i>	Pacific littleneck		<i>pilagtuaruter</i>		
<i>Siliqua patula</i>	Razor clam		<i>ciileviat</i>		
<i>Spisula polynyma</i>	Stimpson's surf clam		<i>wiilu, aliruar</i>		
<i>Telmessus cheiragonus</i>	Helmet crab		<i>melqulgat</i>		
unidentified species	Striped jellyfish	<i>eqaarniq</i>	<i>arnaug</i>		

1 Secondary spelling from Oswalt 1957.

2 Name references same species but possibly different subspecies.

Native orthography taken from primary sources unless specified: Yup'ik, Jacobson 1984; Cup'ig, Amos and Amos 2003; Siberian Yupik, Ainana and Zagrebina n.d.; Inupiaq, MacLean 1981 and Webster and Zibell 1970.

Table 5: Use of marine resources by Yup'ik-speaking Eskimo.

Scientific Name	Common Name	Native Name	Native Use	Reference
<i>Clinocardium nuttallii</i>	Nuttall's cockle	<i>aateutar</i>	Small cockles eaten raw while larger shells are cooked. After ice melts in spring they can be found on beach; sometimes dug for.	Amos and Amos 2001; Kiokun 1997a; Kiokun et al. 2001; Nowak 1975:27; Williams and Williams 1997b
<i>Dendraster excentricus</i>	Sand dollar	<i>qallriucet'ar</i>	Children would use sand dollars as whistles. Small hole was drilled in center/top, dollar placed inside mouth between teeth and lips, and child would blow to create whistle.	Amos and Amos 2001; Kiokun et al. 2001; Lantis 1946:216
<i>Glycymeris subobsoleta</i>	West Coast bit- tersweet clam		Reported to have been eaten by Nuniwamiut but no specific information regarding consumption is currently known.	Nowak 1975:27
<i>Littorina sitkana</i>	Periwinkle	<i>aalemyar</i>	Eaten raw. Mostly eaten by children but some adults also indulge. Children place fresh water in shell and sing to snail to encourage it to come out of shell to assist in eating.	Amos and Amos 2001; Kiokun et al. 2001; Kiokun 1995b; Williams and Williams 1997a
<i>Macoma calcareo</i>	Chalky macoma	<i>amygyar</i>	Eaten when they drift ashore.	Amos and Amos 2001; Kiokun 1995b; Kiokun et al. 2001
<i>Modiolus modiolus</i>	Horse mussel	<i>amygyar</i>	Many families did not eat meat due to red color and warned children to avoid. Others eat meat like other shellfish. Large mussel shells were used to scrape flesh from seal and walrus intestines.	Amos and Amos 2001; Curtis 1978:46; Kiokun et al. 2001; Williams and Williams 1997b
<i>Mytilus edulis</i>	Blue mussel	<i>qapilat</i>	Dipped in hot water and seal oil or eaten raw.	Amos and Amos 2001; Kiokun 1995b; 1997a; Kiokun et al. 2001; Lantis 1946:204
<i>Natica clausa</i>	Arctic natica	<i>nakuumar</i>	Species are known to have been used on Nunivak but elders have forgotten specific details on preparation.	
<i>Nucella lamellosa</i>				
<i>Pandalus borealis</i>				
<i>Paralithodes camtschatica</i>				
<i>Protothaca staminea</i>				
<i>Spisula polywmya</i>				
<i>Siliqua patula</i>				
<i>Telmessus cheiragonus</i>	Hairy crab	<i>melqugat</i>	Cooked in hot water. Legs and inner parts eaten. Speared from kayak in spring or caught with line.	Kiokun 1997b; Williams and Williams 1997a
<i>Tonicella</i> spp. (?)	possible chiton		Usually measures approx. 18" long and comes in different colors and appears only in fall when cold water comes or during storms. Inside is hard like cartilage or rubber, which is removed and washed in fresh water for 1–2 days. Eaten raw, with seal oil or dry fish.	Davis and Davis 2001; Kiokun 1997c; Williams and Williams 1997a
Marine Plants				
<i>Abarenicola Pacifica</i>			Species are known to have been used on Nunivak but elders have forgotten specific details on preparation.	
<i>Anthopleura</i>				
<i>A. artemesia</i>				
<i>Boltenia ovifera</i>				
<i>Cucumaria miniata</i>				
<i>Dendrodoa</i> spp.				
<i>Epiactis</i>				
<i>Fucus gardneri</i>				
<i>Palmaria palmata</i>				
<i>Urticina crassicornis</i>				

All source data, aside from Curtis 1978 and Lantis 1946, taken from interviews conducted by author. Absence of references from other parts of southwest Alaska does not mean that above resources were not used by Eskimo people, only that their use is generally not reported.

harvested and women and children would spend most days on the tundra gathering plant resources.

Most plants were available in a variety of locales, and their harvest did not dictate moving the family to specific camps. Plants that grew in abundance in specific terrain, such as several varieties of cliff greens, usually offered other resources that could be harvested at the same time (e.g., fish, sandhill cranes). Greens such as *Rumex arcticus* could be found throughout the delta and on Nunivak Island and old camp sites are said to contain buried cache pits once used for plant storage.

As an example, when harvesting wild spinach or sourdock, Nunivak elders state that they would stay in an area until they had harvested enough for their family's long-term needs (Amos 1991; Kiokun 1995a). After picking, they would cook the spinach a little bit before placing it into a cache dug underground.

Cook 'em half way, just for the leaves to just shrivel up and not take much space, and they would dig ditches and line it with a certain type of twigs and grass and put 'em in there until the weather gets colder, before the ground get hard, knowing that when it freezes, that *ciwassat* [*Rumex arcticus*] would freeze in with the earth. So before that time they would go over there again, pull the *ciwassat* out and this time leave 'em on top of the ground. . . . They would cover them with grass, probably willows too to keep them together and they would leave them until it freezes. (Amos 1991:16)

Before placing the spinach in the caches, the cooked leaves would be drained of juice and the pit lined with woven grass mats (e.g., *Elymus mollis*). "Some people rolled them up like a ball and put them away. Each roll was made enough for one meal. They rolled the spinach ball big enough for their dinner or a snack. That's how they took them out of the ground" (Amos and Amos 1989:25). Grass was placed on top before the cache was covered with rocks to ensure it would not be disturbed until needed (Kiokun 1995a). Berries were stored in much the same way, except that these pits would be lined with rocks (Kiokun 1995a; Whitman 1995) and raw spinach (e.g., *Rumex arcticus*) was used as an inner lining (Kiokun 1995a). The berries would have no juice when removed, since they would have dried out while being stored underground. In the fall, people would return to their seasonal caches and transport their stored berries and greens to their winter villages. Edward Curtis (1978:36) described a berry cache as "a small box-like

structure of flat stones lined with grass and covered with sod until air- and water-tight." Examples of such features were discovered during recent archaeological excavations on Nunivak Island (see Fig. 5). An analysis of soil sediments (Endo 2006) recovered from these caches revealed the presence of crowberry seeds (*Empetrum nigrum*), which supports their earlier use as berry caches.

CHANGES IN PLANT USE

While recent investigations on Nunivak Island (Griffin 2001, 2004, 2007; Nuniwarmiut Taqnelluit n.d.; U.S. BIA 1995) have added extensive details to previous knowledge of traditional subsistence procurement and storage techniques among the Nuniwarmiut, research within the mainland delta region remains largely unpublished. In researching current use of indigenous flora and seashore species, one must keep in mind that the memories of earlier subsistence use may be affected by historic changes to Native culture. The most obvious change in Yup'ik indigenous plant use, between that found in early ethnographies and at present, is the current lack of knowledge of many previously harvested plants. With the abandonment of many small villages in favor of larger villages with established schools and an increased reliance on western foods, fewer families rely on traditional subsistence resources. Studies (e.g., Nowak 1975) have documented a link between continued traditional subsistence activities and a family's economic position. With village centralization, the cost of purchasing and maintaining the equipment needed to continue traditional subsistence activities (e.g., boat,



Figure 5. Rock-lined cache pits at Ellikarmiut Village, Nunivak Island, Alaska.

four-wheeler, gas) made people dependent on having a steady source of income and time to pursue such activities. In time, information on earlier plant use is forgotten and influences resulting from increased contact with non-Yup'ik mainland peoples can add to or supplant earlier local knowledge. For example, in 1927, Curtis (1978:35) recorded the use of willow leaves (*Salix* spp.) on Nunivak Island as a food and medicinal item. In 1939, Lantis (1959:60) found only one elder on Nunivak who still recalled the earlier use of willow. Today elders routinely deny such traditional use. However, recent influence of northern Eskimos on the island population has resulted in a renewed use of the plant, although contemporary Nuniwarmiut elders believe that its use is only of recent innovation. A similar pattern of traditional versus recent use has been noted for stinkweed/wormwood (*Artemisia tilesii*).

It is easy to assume that observed Native lifeways in the early twentieth century reflect those practiced during the late prehistoric period or before. However, in spite of the evident continuity of tool use and general subsistence practices on Nunivak Island (Griffin 2001, 2004) and the Yukon-Kuskokwim Delta (Shaw 1983) throughout the past five hundred years, traditional lifeways were likely more complex than those historically recorded. Following increased contact between mainland Native peoples (i.e., trade, intermarriage) and Euro-Americans during the nineteenth century, change in the use of indigenous plants was probably an ongoing process, influenced by the degree and type of contact, as well as impacts from a serious loss in Native population resulting from the introduction of western diseases.

Previous research in Native communities within the delta and Nunivak has focused on documenting changes to Native lifeways following the arrival of Euro-Americans to the region (e.g., Fienup-Riordan 1983; Lantis 1946). However, these studies have provided little detailed information on traditional use of indigenous plants. The collection of ethnobotanical information was rarely a focus of research efforts, and a systematic analysis of Native plant use throughout the region has yet to be undertaken. Given the incorporation of western foods in Native diets and a corresponding decline in the harvest of many indigenous plants, efforts to collaborate with Native communities need to be undertaken before information on traditional use of area flora has been forgotten.

CONCLUSION

The degree of contact between mainland and island Eskimo people before the arrival of Russian and Euro-Americans in the late eighteenth and nineteenth centuries is unknown but would have largely been limited to trade between neighboring groups during the summer months. Having to rely primarily on locally available resources for their subsistence, the Yup'ik incorporated many indigenous plants into their diet. Contrary to earlier stereotypes in popular film and literature of Arctic peoples' sole reliance on a meat-based diet for survival, local flora were routinely incorporated into the Yup'ik diet in addition to Native pharmacology and utilitarian tasks.

There are few Native elders with a rich knowledge of traditional plant use in the Yukon-Kuskokwim Delta or on Nunivak Island, and younger generations have not expressed a strong interest in preserving these data. Except for the continuing harvest of a few popular plant species (e.g., *Angelica lucida* [wild celery], *Rumex arcticus* [sour dock], *Caltha palustris* [marsh marigold], *Rubus chamaemorus* [cloudberry]), much traditional knowledge is not being passed on and will likely disappear with the passing of today's elders. It is important that additional research efforts to record traditional use of plants occur before knowledge of such use is forgotten.

ACKNOWLEDGEMENTS

The author wishes to acknowledge the collaboration of the Mekoryuk community whose participation and assistance throughout the past fifteen years made this article possible. Funding and logistical support were provided by the U.S. Fish and Wildlife Service regional and Yukon-Kuskokwim Delta offices. My deep appreciation for the continued support and encouragement of Debra Corbett, U.S. Fish and Wildlife Service archaeologist.

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