

Economic and Cultural Significance of Driftwood in Coastal Communities of Southwest Alaska

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Abstract

Four coastal communities (Sand Point, Togiak, Hooper Bay, and Scammon Bay) representing a transect from the Alaska peninsula north along Bristol Bay to the mouth of the Yukon River were visited during August 2003 in order to assess the economic importance and cultural significance of driftwood. Inhabitants in these communities depend for the most part on subsistence lifestyles. Within each community, interviews were conducted with native elders and local craftsmen to examine historical and contemporary uses of driftwood. Questions were designed to address both economic and cultural uses and values of the resource.

An investigation of local driftwood resources indicates that availability of driftwood and species compositions of driftwood piles varies considerably throughout the region. In the Aleutian Islands, logs come mainly from Southeastern Alaska while in Bristol Bay their main origins are river basins of Interior Alaska. Based upon results from the interviews and investigation of local driftwood resources, it was concluded that driftwood remains an important resource, particularly in the Yup'ik area (Togiak, Hooper Bay, and Scammon Bay). Today, uses of driftwood, which in some cases is species specific, includes: heating, smoking salmon, fuel for sauna or steam baths, drying racks, model boats, masks, utensils and doll faces. In the past, driftwood was also used for kayaks, arrows and bows, snowshoes, dog sleds and house frames, among others. The use of driftwood as a primary heating source has declined throughout the region but its potential for other economic and cultural uses remains strong. Driftwood species commonly used includes western red cedar, Alaska yellow cedar, Sitka spruce, cottonwood and hemlock in the Aleutian Islands. In the Yup'ik area, white spruce, willow and cottonwood are mostly used, but occasionally logs of red cedar, Alaska yellow cedar, and hemlock are found.

“There are lots of things you can do with driftwood.” Bruce Foster Sr., President of the Unga Corporation in Sand Point.



Driftwood in the surf of the Bering Sea, Hooper Bay, Alaska. Photograph taken by Bob Wheeler

Introduction:

Along the treeless coast and islands of Alaska, driftwood has always been the main source of wood for people. Driftwood mainly transported by rivers and delivered by the sea is a natural and renewable resource. The communities we visited have no adjacent forest area and driftwood has traditionally met both economic and cultural needs. Driftwood was used for a variety of purposes and was part of many subsistence activities. Our review of driftwood's use in four coastal communities has helped us better understand the traditional importance of the driftwood resource and see opportunities for their sustainable economic development. However as noted by Wein for the Mackenzie River, a sustainable economical use of driftwood needs to consider the flow of logs downriver, the rate of deposit/arrival, and the rate of decay (Wein, nd.). These factors are highly variable and dependent on storm conditions, flood, and rate of precipitation.

This report provides a first assessment of driftwood availability near four communities of Southwestern Alaska. It looks into its use by people and its importance through time as a natural and renewable resource.

We began our survey by consulting with each of the four communities visited: Sand Point, Togiak, Hooper Bay, and Scammon Bay (Figure 1).

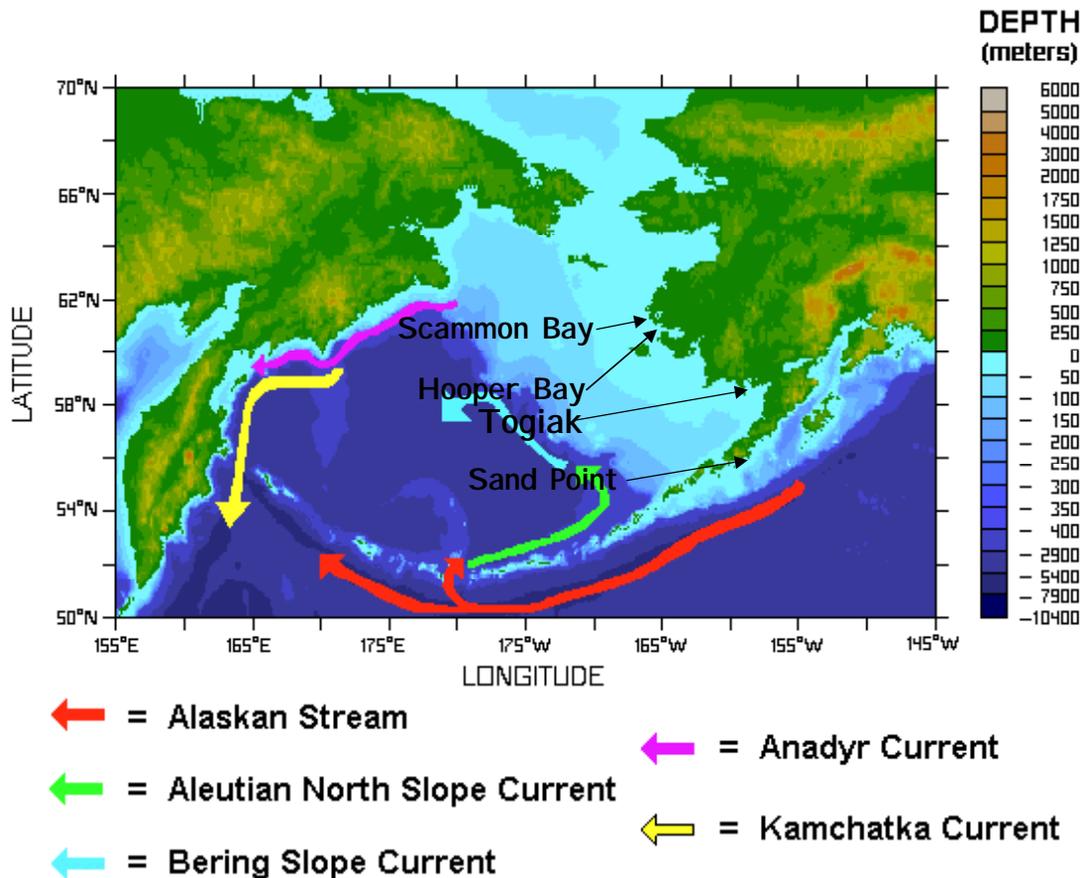


Figure 1 - Location of the four visited communities and main ocean currents (Map from <http://www.pmel.noaa.gov/np/pages/seas>)

Our assessment of driftwood as a resource consisted of conducting interviews with native elders and local craftsmen in each community and investigating the composition of nearby accumulations. Interviews were based on a list of questions designed to address several themes: past and present use of driftwood in the community, wood selection and collection criteria, techniques and season of procurement, types of wood and woody materials found in the driftwood, driftwood accumulations and rates of decay, importance of wood carving in the community, cultural activities associated with driftwood, driftwood origin and delivery, and economic opportunities for making and selling products made of driftwood. Results from these interviews provided us with an

understanding of the relative distribution of driftwood in the area and the importance of this resource in the communities. Knowledge of where to collect driftwood and ways of working with driftwood, in many cases, is based on cultural and practical considerations founded upon generations of experience. This review provides access to that collective knowledge.

Throughout the region, consistent themes of activities involving driftwood were found mainly in the uniform use of cottonwood for smoking fish. In the Yup'ik area, driftwood is used to fire the maqi (sauna bath). Dried and rot free driftwood is preferred and worth traveling great distances. A common observation was that rough bays were the best places for driftwood. As a rule, three environmental factors are affecting driftwood deposition: winds, tide, and currents.

Overall, people had the impression that driftwood was less abundant today than in the past. However driftwood remains a relatively important resource throughout the region, particularly in the Yup'ik area.

Sand Point:

Sand Point is a community located on Popof Island on the south side of the Alaska Peninsula. Popof Island is the second largest island (after Unga) of the Shumagin Islands. The area of Popof Island has no residual high forest but has dispersed low-lying thickets of alder and willow shrubs.

- The Sand Point economy is based primarily upon a large commercial fishing fleet and local cannery.
- Population: 919 (2002 DCED Certified Population), 44% of the population are native or part native Alaskan.
- Unemployment: 30.8% with 48.7% of all adults not in the work force. The median household income is \$55,417 and an estimated 16% of the residents are living below the poverty level. (Based upon the 2000 US Census)
- Residents of Sand Point heat their homes primarily with oil. It was estimated that less than 25% of the homes have wood stoves to augment their heating performances. In Sand Point driftwood is often considered to be a backup source of fuel.

Sand Point is an area that receives a broad mix of driftwood species largely originating in the forests of Southeast Alaska. Most of the driftwood collected is accessed by boat and requires traveling as much as 20 miles.



Boat in harbor at Sand Point unloading driftwood. Photograph taken by Claire Alix

A few people in the community practice carving or model building as a pleasurable and hobby-like activity. Often these carvings and models are made of driftwood. Thus even though the occurrence of carving and crafting is still limited, there would be a strong interest in developing these activities as ways of diversifying the economy.

Moreover, there is currently some mention of expanding the harbor to allow for visits by cruise ships. If this were to occur, this could open new economic opportunities and venues for selling crafted items and carvings from driftwood. Presently, a few examples of wood, ivory and traditional crafted items, models and art pieces (e.g. carvings by Peter Devine) are displayed in the city hall.



Carving by Peter Devine. Photograph by Adam Knight

The airport hall is another location where art pieces and carvings are exhibited, such as the kayak models made by Charlie Jackson. Apart from these two places, there are very limited facilities for the sale of locally made crafted driftwood and carvings or other art forms.



Kayak models made by Charlie Jackson. Photograph by Claire Alix

- People Interviewed in Sand Point

Hubert Mucallum, 83 years old, has lived in Sand Point all his life. Hubert was a fisherman before World War II and an accountant after the war.

Bruce Foster Sr., 70 years old, was born and raised in the village of Unga on Unga Island. He is currently the president of the Unga Corporation at Sand Point. He has been living in Sand Point since the people of Unga moved out of the Island. This happened after World War II when the administrative offices were relocated and the school closed in 1959. Bruce is part Aleut; his grandmother was a full Aleut.

Ruel Holmberg, 74 years old, is a retired fisherman who has been living in Sand Point since 1965. He was born and raised on Sanak Island. His wife Agnes is Aleut from Akutan.

Charlie Jackson, 40 years old, is a local fisherman and carver. He is part Aleut.

We recorded a casual conversation with Ryan Paul Wolcoff, who has been living in Sand Point for the past 4 years. He is currently considering installing a wood stove in his house as a means to cut back on his winter fuel bills.

During the public meeting held in Sand Point we met Peter Devine, a local wood carver who displayed two of his carvings, one made from driftwood.

- An Assessment of Driftwood Availability in Sand Point

The city of Sand Point faces the northeast coast of Unga Island along the Popof Strait. Not much driftwood was found in the area nearby the town. Local people mentioned three places directly accessible from the village by car, four-wheeler or by walking, where one might find some driftwood:

- The beach near the airport (by car and foot), which during our visit was largely devoid of driftwood.
- A cove down from the post office reached by hiking along the cliff.
- Red Cove on the other side of the island. Red Cove can be seen from the end of the road that goes inland and then can be reached by hiking for some time along an existing trail.

When asked where driftwood was to be found, several people mentioned Lumber Bay on the mainland or the area of Saddler's Mistake on Nagai Island (southeast of Sand Point) as places where one could see large quantities of driftwood.

As Hubert Mucallum told us, “Driftwood is like salmon. Any place where the salmon goes to shore is a good place for wood; any place where there is driftwood is a good place for fishing.” People we talked to agreed that in general, rough bays were the best places for finding concentrations of driftwood.

However, wind patterns seem to be one of the major elements influencing the presence of wood on a beach. As Bruce Foster Sr. said, “It all depends on the way the wind comes.”

Outside of Sand Point, driftwood is found along the entire northwest coast of Unga Island. Driftwood accumulates particularly in small coves. At Unga spit itself, driftwood was not abundant and was often embedded in sand. It was scattered along the beach and near the Petrified Forest, mostly pushed against the cliff and often mixed with fragments of petrified wood.



Unga Island driftwood. Photograph taken by Adam Knight

- Types of Wood Available

Previous work at Unga Island and Unimak conducted in 2002 during the “Harriman Expedition retraced”, has shown that driftwood in the area most probably originates in the spruce-hemlock forest of Southeastern Alaska and further south (Alix and Koester 2001). Genera such as *Thuja sp.*, *Chamaecyparis sp.*, *Picea sp.* and *Tsuga sp.* were commonly found in the

deposits. They are regularly mixed with more southerly wood such as Douglas fir [*Pseudotsuga menziesii* (Mirb.) Franco]¹, red alder (*Alnus rubra* Bong.) or fir (*Abies sp.*) (*ibid.* 6-9).

Discussions we had with folks in Sand Point confirm the diversity and probable southeastern origin of wood types found on the beach. Alaska cedar [*Chamaecyparis nootkatensis* (D. Don) Spach] and western red cedar (*Thuja plicata*) are the most commonly mentioned species probably because their color and smell make them easily recognizable. Cottonwood [presumably black cottonwood (*Populus trichocarpa* Torr. & Gray) and also balsam poplar (*Populus balsamifera*)] are quite common and well known. Cottonwood is almost always used for smoking fish.



Cottonwood driftwood being soaked for smoking. Photograph taken by Claire Alix

According to Hubert Mucallum, red cedar is presently the most commonly found cedar wood. Years ago there was apparently a lot more yellow cedar logs but not anymore.

¹ Nomenclature follows Viereck and Little 1991 (1st ed. 1972)



Western red cedar log on Unga Island. Photograph taken by Claire Alix

Bruce Foster Sr. mentioned finding oak (*Quercus sp.*) on the beach. This oak probably refers to lumber lost at sea by ships. This is echoed by Dick Jacobson who mentions this important source of material. He recalls the delivery of a whole shipment of good logs from a wrecked ship several years earlier. This information is also confirmed by Ruel Holmberg who mentions the “providential” loss of a shipment of wood, some twenty years ago. In earlier years another important source of wood was the fish trap pilings that drifted to shore. They seem to have been the main source of fuel for people of Sand Point and near islands (H. Mucallum; B. Foster, R. Holmberg).

A significant and important portion of the driftwood accumulations is composed of timber and logs from the forest industry and from human activities. Thus it is difficult to evaluate how much driftwood was available before intensive human activities started in the North Pacific Ocean and the Bering Sea. In the Sand Point area driftwood are commonly worn and broken up or have been damaged by marine wood borers.



Driftwood attacked by wood borers. Photograph taken by Claire Alix

Some however, are long logs that kept their root system. As H. Mucallum said, “only the sturdiest of the wood can survive the surf”.

Fragments of bamboos are found regularly among the drift logs. Ruel Holmberg remembers finding fragments of bamboo when he was a child looking for and collecting firewood on Sanak Island. Hubert Mucallum showed us a complete bamboo stem about 19 feet long that was found on the Bering Sea side of the Alaska Peninsula some 22 years earlier. However, finding a complete bamboo log remains rare.



Hubert Mucallum in Sand Point with driftwood bamboo pole. Photograph taken by Claire Alix

Together with the logs and other wood pieces, many fragments of bark are also washed onto the shore. Cottonwood bark, and strips or small rolls of birch bark are the most common barks found in driftwood accumulations along coastal Alaska and Bering Strait. However, on the beach of Unga spit, fragments of bark from different species of wood were also collected. These came from trees such as Douglas fir (*Pseudotsuga menziesii*) or hemlock (*Tsuga sp.*) and further confirms the diversity of wood types available and their quite distant origins.

- Past usage of driftwood

Our meetings with people in Sand Point provided some information about recent and past use of wood and driftwood in the area, especially on Unga and Sanak Islands (Bruce Foster Sr. and Ruel Holmberg). However, elders we spoke with did not have many memories of long past life and wood use. As Bruce Foster Sr. recalls, most of what is known about the history of the region goes

back to 1700's, with the first Russian accounts. For earlier information, one has to use the archaeological literature.

Prehistorically, driftwood was the main source of wood for inhabitants of the Aleutians whose area was occupied by only small trees and bushes. A good gravel beach for landing skin covered watercrafts, a good supply of fresh water, a good salmon stream as well as the availability of driftwood or access to stone material are described as criteria for deciding where to settle (Black and Liapunova 1988). Wood was used in the making of many tools, weapons and utensils such as bows, shafts and bowls, and as frame material for semi-subterranean houses, boats and sleds.

Historically, Aleut woodworking is particularly well known thanks to the beautiful wooden hunting hats, masks, baidarkas (kayak) and baidaras (umiak) that have survived in museums. According to Zimmerly, "Aleut vessels are perhaps the finest sea kayaks ever made by any Arctic peoples, being fast, light and seaworthy" (Zimmerly 2000:18). From her visit to Akutan Island in 1971, Joëlle Robert-Lamblin reports that spruce, probably Sitka spruce (*Picea sitchensis*) is the most frequently found wood and is used for the kayak frame and the paddles; yellow cedar (*Chamaecyparis Nootkatensis*), a light, solid, durable wood with excellent bending characteristics was used for the kayak ribs, cockpit framing or spear thrower, but never for the paddle for it retains too much water; red cedar (*Thuja plicata*), a light wood, was used for the harpoon shaft, bailer, knife case but never for the frame for it is too light and breakable (Robert-Lamblin 1980:footnote 4). Bruce Foster Sr. in Sand Point mentioned that driftwood and also alder was used in the building of baidarkas. He also noticed the good bending properties of yellow cedar that he uses to make his boat models.

Driftwood was the prime material for bara'bara, the common house used by Aleut people on Unga Island and elsewhere in the Aleutians (Bruce Foster). Masks were also an important part of the ancient Aleut culture and were linked to burial purposes (Black 1993). However, little is known of their exact function and their associated ritual (Ibid.). Aleut headgear (hats and visors) was the finest wooden items manufactured by Aleut carvers. With these objects mostly ceremonial (Wallen 1990; Black 1991), the Aleut developed the art of bentwood technology (Ibid.). No information is provided as to whether or not bentwood hats were made out of driftwood or if the wood came from wooded areas and obtained through trade or special journeys to the forest. There is no information either on the types of wood used and if some species were preferred. However during the *Bending Tradition project* in 1988 and 1989, Sitka spruce seems to have been the preferred wood used for bentwood hats (Wallen 1990:35-36). Considering the good bending properties of yellow

cedar, it is probable that some hats were also made from that wood. Today some people still know how to make these hats. The late Andrew Gronholdt from Sand Point (or Unalaska), a recognized artist, taught bentwood hat making in several communities. Bruce Foster, Ruel Holmberg and Charlie Jackson, all remembered Andrew Gronholdt and considered him a master. One of his hats is exhibited at the Anchorage Airport.

Historically, in the village of Unga and on Sanak Island, the primary use of driftwood was firewood. Collecting driftwood was an activity mainly performed in the summer and in the fall as people were getting ready for winter. In the village of Unga, at the beginning of the 20th century and up to the Second World War, driftwood gathering was a collective activity. In the fall, people would get together and collect logs and smaller wood. Logs were cut into smaller pieces and the annual harvest was shared among inhabitants of the village.

“Before..., everybody would get together and just get wood and then share it... But now you do it yourself” (Bruce Foster 2003).

After the Second World War, the codfish industry went down and people started moving away. With the fishing industry, the school also went down. As Bruce Foster Sr. said “it did not take long”. Today collecting wood for fuel is an individual activity.

On Sanak Island in the late 1930's up to the early 1950's, Ruel Holmberg remembers spending most of his childhood collecting wood.

“Around Sanak where I grew up (...) that's all we had for heat, and cooking... We had to go along the beaches, pick it up. (...) sixty feet logs, we would go through a dozen a year. It was a constant job to chop and cut the wood and to carry it inside the house. (...) You know when I was living on that island, it was a matter of survival. You survived day by day.”

On Sanak Island, most people could not afford coal, and driftwood was the main source of fuel. Only the school was heated with coal. After 1947, a shipment of oil drums drifted on the shores of Sanak Island and people started using oil for fuel. Driftwood or oil, their fuel supply was still brought by the sea.

In Sand Point, driftwood supplemented coal that came from Dillingham. This supplement was very important for coal was expensive (Hubert Mucallum, Aug. 2003). According to Hubert, anything but cottonwood was collected for firewood. However, when there was no driftwood on the beach, alder would be used for firewood (Edgar Smith Sr. 2003).

Cottonwood was used for smoking fish, as it is still used today. According to Bruce Foster, “alder is okay but it’s got too sharp of a taste. When you mix it, it’s okay”. As noted elsewhere, the notion of taste and preferences as well as how wet or dry the wood plays an essential role in the selection of wood for smoking fish (Alix and Brewster nd.). Because cottonwood is largely used for smoking fish, it appears more difficult to find nowadays in the surroundings of Sand Point:

“Cottonwood was abundant at one time, now you have to go far, out of town and only the big logs are left... you need a chain saw to cut them. Cottonwood is the most valuable to me” (Hubert Mucallum, 2003)

Summary: The Sand Point community is both highly commercialized and at the same time dependent on traditional modes of subsistence. Local craftsmen produce a variety of carved wood items for display and eventually sale. However opportunities seem more limited by the absence of venues to sell art products than by the interest in carving or the availability of the driftwood. Driftwood in the area could easily provide sufficient materials to support greater production of crafted wood items. Marketing and sales will need to be linked with the communities’ ability to draw outside visitors to the area. Although there is some carving of driftwood, this resource is presently seen primarily as a backup source of heating fuel for the oil furnace and for smoking salmon.

Togiak:

A community located about 67 miles west of Dillingham at the head of Togiak Bay. Although the community is dependent upon a commercial fishing industry, the entire community depends on subsistence activities.

- Population: 804 (2002 estimate by the Alaska State Demographer, DOL) 92.7% are native Alaskan
- Unemployment: 26.8% with 67% of adults not in the work force. Median household income is \$23,977 with 30% below the poverty level.
- Heating fuel cost: \$2.40 per gallon with tax. Nearly all homes are heated by fuel oil and few homes have both wood stoves and oil furnaces. (Based upon personal communications with Moses Kritz)

- Native Arts and Crafts: The community maintains a gift shop for the sale of native art, which includes carved items of wood and ivory. Local ivory and, less often, wood carvers have great skill and produce high quality items for sale. An example is a carved driftwood mask with attached carved ivory images that was being advertised at \$1,200. Additionally, items made from driftwood for sale included dolls (faces) and utensils. Historical uses of driftwood have changed somewhat but there continues to be an interest in the collection and use of driftwood for art within the community. Willie Wassilie, a local carver indicated his recent renewed interest in wood carving and intended to try carving into a mask a piece of western red cedar driftwood.



Willie Wassilie with a carved wooden mask (wood and ivory). Photograph Claire Alix

The Togiak River feeds into Togiak Bay and is an important source of driftwood. Although there are limited supplies of driftwood within the village, many of the community will collect driftwood by boat from locations further out into the islands in Bristol Bay to the west. A variety of species of wood are available and people are specific in their desire to harvest driftwood for certain purposes such as cottonwood specifically for use in smoking salmon. Piles of driftwood are found around many of the homes and it was estimated that more than 200 homes in the community have their own steam bath fueled primarily by driftwood. Operation of a steam bath involves loading up a barrel stove with dried wood and the charge will last about 3 hours. Although all the steam baths are wood based, nearly all the homes in Togiak are heated with oil.



Driftwood in Togiak provides fuel for heating and a home for birds. Photograph taken by Claire Alix

- People Interviewed in Togiak

Annie Blue, 87 years old, was born in 1916 at Kussiaq up the Togiak River. She moved to Togiak in 1942 but also lived in other villages.



Annie Blue with Annisha Kritz, Togiak, Photograph taken by Claire Alix Marie K. Active, 78 years old, was born upriver on the Togiak River in 1925



Marie Active, Togiak Photograph taken by Claire Alix

Jack Gosuk, 69 years old, was born in Kulukak Bay, just east of Togiak Bay. He moved to Togiak when he was an infant.

Peter Abraham currently works as a Refuge Information Technician. He was born in Nightmute on Nelson Island and was raised at winter camps. He came to Togiak in about 1968.

Willie and Margaret Wassilie are respectively 67 and 64 years old. Willie is originally from the region of Hagemester Strait. Willie is an ivory and wood carver and Margaret is a basket maker.

Annisha Kritz served as our interpreter during most recorded interviews (Annie Blue, Marie Active and Jack Gosuk). Margaret Wassilie interpreted for her husband.

- An Assessment of Driftwood Availability

Driftwood is not abundant in the immediate vicinity of Togiak. A few logs and stumps, and numerous small woody debris are found directly on the beach.



Shoreline in Togiak. Photograph taken by Claire Alix

Most of this wood comes down from the Togiak River and consists of cottonwood (*Populus balsamifera*), willows (*Salix spp.*) and some occasional

birch (*Betula papyrifera*). Spruce logs (*Picea sp.* probably *P. glauca* [white spruce] or *P. mariana* [black spruce]) are typically absent from Togiak's nearest driftwood accumulations. To find spruce, one must go west, about 30 to 40 km down the coast or on islands such as Hagemeister, Walrus or the Crooked Islands, where driftwood is much more abundant and where spruce has drifted down from the Kuskokwim River (Peter Abraham, Willie Wassilie, Jack Gosuk). However, even in these places, spruce is never particularly abundant. No Kuskokwim driftwood is likely to be found in front of Togiak.

Southeastern winds and high tides are two key elements in the delivery of driftwood to Togiak (Annie Blue, Marie Active, Jack Gosuk). According to Annie Blue, southeastern winds bring lots of different kinds of wood. But lots of driftwood also comes when heavy rain accompanies this southeastern wind (common in August). This wind not only brings wood to the beach but also clams (Marie Active) and is of prime importance for subsistence activities. On the contrary, northern winds take driftwood back to sea.

According to Peter Abraham, today more wood is eroding from the banks of the Togiak River due to the return of beavers and increased motorboat traffic. Indeed many beaver cut wood chips were found in the actual tide line, mixed with algae and clamshells.



Driftwood debris on beach at Togiak. Photograph taken by Claire Alix

However, when asked whether more or less driftwood was being found today along the coast, most of those we consulted had the impression that less wood was drifting to shore today than in previous times.

Species from Southeastern Alaska are also delivered to the Togiak area. Peter Abraham recalls finding Alaska yellow cedar (*Chamaecyparis nootkatensis*) from time to time, however never down the coast.

“It seems like I found it on the east side over there toward Cape Constantine area and one time I found one, down there on one of the islands... in the Crooked Island. [...] this one was definitely yellow and the smell was strong. (Peter Abraham, August 2003).

Peter estimated that he would come across one log of yellow cedar every four years or so. He also recalls finding a 10 to 14 foot long log with a 4 to 5 foot diameter on one of the inlets:

“I don’t think it was spruce, but it burnt well in the sauna bath. I think it was hemlock” (Peter Abraham, August 2003)

Western red cedar occurs as well. Willie and Margaret Wassilie showed us a piece of red cedar they had collected west of Togiak on the ocean side of Hagemeister Island. Margaret told us she never sees them in today’s driftline but “only from a long time ago... way up in the grass”. She always looks for them because she says “there are no trees like that around here and they smell good”.



Block of western red cedar at home of Willie and Margaret Wassilie in Togiak.
Photograph taken by Claire Alix

The presence of Alaska yellow cedar, western red cedar and hemlock wood indicates that logs from Southeastern Alaska make their way to Bristol Bay. Indeed the Alaska Coastal Water Current (Stabeno et al. 1999: fig.2) follows the Pacific side of the Alaska Peninsula before turning east at Unimak pass and following the Bering Sea coast of the Alaska Peninsula toward Bristol Bay and the Togiak area. This circulation pattern in itself explains the occurrence of these logs in the area of Togiak. Analysis of driftwood from St George Island in the Pribilof Islands had shown that logs from Southeastern Alaska made their way past Unimak Pass (Alix and Koester 2001), however their occurrence in Bristol Bay though assumed and locally well known, had not, to our knowledge, been reported.

In Togiak, a large pile of driftwood is stacked behind the ACE general store. After inquiries, we learned that it had been collected by a former store manager over several years for decoration purposes. Since then, the pile seems

to be getting smaller every year. People are taking some, the present store manager told us. Most of the logs in the pile were cottonwood and willow.



Driftwood piled up behind the AC store in Togiak. Photograph taken by Claire Alix

- Past usage of wood

“Driftwood was very important for the community, for the people” (Peter Abraham August, 2003, Togiak)

According to the Alaska Community Database, “Old Togiak” moved from its past location across the Bay in 1880 because “heavy winter snowfalls made wood-gathering difficult at Old Togiak, so gradually people settled at a new site on the opposite shore, where the task was made easier.”

(www.dced.state.ak.us/cbd/commdb/CF_CIS.cfm?comm_boro_name=Togiak).

This, in itself, shows how essential a resource wood was for the everyday life of the Togiak people.

From the Yukon Delta down to Bristol Bay, Yup’ik material culture is a testimony to the importance of wood. At the local museum in Dillingham, one enters the exhibit by stepping under a driftwood arch. In the show cases many of the art pieces and objects, ancient and modern, were made of wood and driftwood including masks, shaman’s hands, bentwood containers, ladles and

sleds. The public school in Togiak was also exhibiting some wooden objects. Artifacts collected from the old Togiak village testified of past wood importance in the community. Artifacts in the display include bentwood containers, trays, spoons and several wedges for splitting wood.



Bowls and wood implements displayed at the school in Togiak. Photograph taken by Claire Alix

Wood and driftwood were used in the construction of individual sod houses, and the men's house (*qagsi*), umiak and kayaks, sleds, and a myriad of implements as important as the bow and arrow, harpoon shafts, fish traps, containers and ladles. Wood was also used for drums, wooden hats and masks that were major elements of the ceremonies giving rhythm to the seasonal subsistence cycle. Moreover, in Southwestern Alaska, wood and driftwood were essential to fire up the sauna bath (steam bath or *maqi*) or previously the fire bath², a central element of Yup'ik everyday life.

Peter Abraham explains how several men contributed, or still contribute wood to the sauna/fire bath, how this activity was, and often still is, a communal one:

² The idea of sauna bath, of steaming, was introduced by the Russian. Before the sauna bath, men used to take a sweat/fire bath in the *qagsi*. This fire bath was a dry bath taken without water at very high temperature (Oswalt 1967).

“In fact from the stories I used to hear, one guy don’t supply all the wood... so they use to have a game out of it... the loser would supply wood... they wrestle something and the loser supply wood... they’d have four, five of them bringing wood... some guy would start “hey today it’s warm weather to go out, we gotta, we gonna have a fire bath... well, I saved wood over there...” so the guy would bring a piece of wood, and next thing you know another guy bring wood and pretty soon some guy is splitting wood there and small pieces may be four foot long... you know, everybody pitched in... and then they had fire bath...” (Pete Abraham, August 2003, Togiak)

- Wood procurement in Togiak

Today in Togiak, driftwood is less used than in the past. But in Togiak, people do not seem to have relied on driftwood as much as in other coastal communities or in the Kuskokwim Delta. Elders told us that, traditionally, to collect wood, people would go upriver to where trees grow. In the past, Togiak people used mostly birch trees from about 20 miles upriver and would get their spruce in the driftwood to the west or exchanged it with people from the Kuskokwim Delta. Indeed, spruce wood in the Togiak area was a rare and precious commodity, which required long trips along the coast or exchanges as raw material or already manufactured objects. Both Annie Blue and Marie Active showed us ladles and bentwood containers that had been made “up north” by people of the Kuskokwim. Thus in Togiak most of the wood that was used was birch trees, cottonwood and willow trees or driftwood collected on the islands near Togiak and along the coast westward. As already mentioned spruce was rare and it could take up to 2 to 3 years to gather the material needed for making a kayak (Peter Abraham, August 2003). In 1975, the Togiak school organized a kayak making project with elder Eddie Alexie and the children (Cherry 1980: 56). The wood used by Eddie for making this kayak was spruce and birch that had been collected “up river before it froze solid for the winter”. This confirms that driftwood was not the only source of wood in Togiak.

Time of collect: wood was gathered mostly in the winter with dog sleds and in the summer with a skiff. In the summer women would harvest a lot of small driftwood along the beach because most of the time they would cook outside if it was not raining. Apart from firewood for the stove, the steam bath and the smoke house, specific wood would be collected for specific usages. Specific names exist in Yup’ik to refer to these different woods and their usages (*Cf.* Jacobson dictionary, 1984). Men carvers were very particular when selecting wood. As Peter Abraham told us, they would only like certain types that they would smell and taste, and would split to see how they split.

- Wood for sauna and wood stove

Peter Abraham had a lot to say about what was best to burn in the sauna bath, the smoke house or the stove. Elders had taught him what wood produced the best heat:

“... [an elder] told me about the kinds of wood you can burn... which one produces the most heat. For instance, green cottonwood will never produce a lot of heat but they keep burning so therefore it’s good for smoking but if it’s dry it produces a lot of heat. The spruce does throw heat but there are two kinds. One is dead already but still has its bark on, it does not produce really super heat. But the one without skin, [...] and it’s been standing for quite a while not lying down, that one when you chop it up, it’s really hard, and when you split it, you could hear, it will crack... makes that noise and you know that’s a super good wood. The other one that throws the most heat is the birch. That one, that hottest... [...] it became harder from drying... the harder it is the hottest it gets. Otherwise you could take a birch and take it home and let it dry for about a year or so, it throws heat... the other one is when you could burn it green. They burn slow but they do throw a lot of heat. The gentlemen I talk to, he described this for me... so I can test this out. Sure enough what he said was true... I learn to select my wood for my sauna bath when I’m out there...” (Peter Abraham, August 2003, Togiak).



Driftwood firewood at the home Mary Active. Photograph by Claire Alix

For firewood however, people would also burn local brush, especially if they had run out of driftwood. In some areas, where driftwood was not plentiful, Peter Abraham recalls that people would go to the hills to gather two types of bushes, and sometimes had to spend the night up in the tundra.

As we found in Sand Point, people in Togiak preferred cottonwood (*Populus balsamifera*) for smoking fish, either from the beach driftwood or from trees that they cut along the Togiak River.

- Wood for making implements and constructions

Birch and spruce were the two main wood taxa used for building kayaks and sleds or bows. Arrows and fish traps were mainly made out of spruce driftwood. Many parts of the kayak as well as bowl bases, ladles, and spear throwers were made out of the stump that according to Pete Abraham is lighter and easier to work with and firmer. But locally spoons and bowls were made out of live trees from the riverbanks, mostly birch (Jack Gosuk).

Marie Active remembers her dad used to trade squirrel skins for wood. About 52 squirrel skins were required to make a parka and 104 squirrel skins would be traded for a kayak frame (Marie Active August 2003).

Implements were made that required bending the wood. Wood lacking knots were chosen for this operation. Wood was soaked in water and heated prior to being bent.

Today carvers in Togiak mostly work with walrus ivory and wood is not often carved anymore. However, Willie Wassilie, a recognized ivory carver, is experimenting with wood and has recently been carving several masks.

Summary: There are several highly skilled craftsmen (both men and women) in the community but very few carve and work with driftwood. Although the supply of driftwood is limited in the immediate area of Togiak, high quality driftwood logs can be found on nearby islands. The demand for driftwood for uses other than for steam baths is low although there are opportunities for the display and sale of crafted items.

Hooper Bay:

The village of Hooper Bay is located on the north coast of Hooper Bay, about 20 miles south of Cape Romanzof and 25 miles south of Scammon Bay.

- Population: 1,075 (2002-DCED Certified Population) 95.8% are Alaska Native or part native.
- Hooper Bay is a traditional Yu'pik community. The local economy is based on halibut and herring commercial fishing and subsistence activities. Unemployment rate is 37.27% although 65.94% of all adults were not in the work force. Median household income was \$26,667, and per capita income was \$7,841 with 28% of the residents living below the poverty level.
- (<http://www.beringsea.com/communities/index.php?community=154>)
- Heating fuel cost was estimated at \$2.82/gallon without tax in November 2003 (Personal communications with Elmer Simon) but had raised to \$3.11/gallon in April 2004 (Personal communication with Bosco Oslon).

- The community is seeking to develop the Naparyarmiut Arts and Crafts Cooperative. (2003 DCED Alaska Community Information Summary)

Storms deposit large quantities of driftwood along the nearby shoreline, but as in Togiak, it was mentioned that storms, especially fall storms, also wash the driftwood away from the beach. The annual deposition fluctuates from year to year however a sufficiently large volume of driftwood is delivered locally. This situation has resulted in the substantial utilization of driftwood for heating home and sauna bath, and for smoking fish and meat. Collection, drying, and storage in large piles are constant and common activities in Hooper Bay. Today driftwood collection is done primarily by ATV and snowmachine.



Driftwood collection is commonly done by use of ATV's in Hooper Bay, Alaska. Ronald Seton is standing by his ATV loaded with driftwood. Photograph by Bob Wheeler, 2003

During the summer, logs are vertically piled in “teepees” and left to dry on the beach. Owners of these wood piles will come to collect them by snow machine during the winter. Travel may require from 5 to 40 miles in order to find quality dried wood. Some of the driftwood is sold for about \$20 per snowmachine load while fuel for the snowmachine costs about \$7.00 per tank. Logs are then vertically piled up by each house



Driftwood storage pile near a home in Hooper Bay, Alaska. Photograph by Claire Alix

Most households in Hooper Bay heat their homes with both oil and wood stoves. The cost of heating fuel is about \$171.05 per 55 gallon drum or around \$3.11 per gallon without tax (April 2004). An oil burning stove will burn about 5 gallons per day (or day and a half) at a cost of \$15.55 per day. Burning driftwood in the wood stove increases the heating capacities of the household and reduces the overall heating costs. It was estimated that using wood in addition to oil cuts the heating bill in half. For six months of winter, the savings of using driftwood is at least \$5.00 per day or \$900 and could be as much as \$1800. This explains the reliance on driftwood and the time and energy put into its collection.

About 25% of the houses in the community have their own facilities for steam bath in which they burn driftwood. These steam baths take an arm load of driftwood in a 55 gallon drum stove, which usually lasts 2 to 4 hours.

There are several wood carvers in the community (James Gump, Joseph Smart or Don P. Tall Sr). Unfortunately, during our short visit many were in Chevak participating in a summer festival. The use of the driftwood as a carving material has significant potential due in part to the diversity and value of the driftwood available but also to the quality of the craftsmanship. Moreover the young generation could show a strong interest in carving. Development of a carved wood items business could have success in Hooper Bay but additional training in marketing would need to be provided.



Gilbert Tomaganuk with the mask he made. Photograph by Laura Weaver

-People interviewed in Hooper Bay

Martha Kopanuk, 92 years old, is the oldest elder of Hooper Bay. Martha was born and raised in Scammon Bay

Joseph Smart, 82 years old is a carver. Joseph was born in Hooper Bay on July 14, 1921 and has spent all his life in the community.

Aaron Rivers Jr. served as our guide and interpreter.



Interview with Martha Kopanuk and Aaron Rivers Jr. Photograph by Claire Alix

We held a meeting at the Tribal Council in the early afternoon of August 18. It was attended by Blaise Tinker, Joseph Smart and Gertrude Bunyan. Eric Olson Sr. was our interpreter during the meeting.

- Driftwood Assessment in Hooper Bay

As mentioned above, driftwood is easily available on the Bering Sea coast, which is only 2 miles away from “down town” Hooper Bay. Logs of spruce (*Picea sp.*), cottonwood (*Populus balsamifera*) and willow (*Salix spp.*) are the most common species found. Very few fragments of birch (*Betula sp.*) are seen. All the people we met told us that driftwood comes from the Yukon River. It usually arrives in the summer time around June, a month after the breakup of the Yukon River, and continues throughout the end of August. Wind is the essential agent of wood arrival. Northwest winds bring wood to Hooper Bay, while a south wind takes it away. Martha Kopanuk could not remember finding wood of unusual origin.

The overall volume of wood being delivered to Hooper Bay is rather important even though the general impression is that recently less wood has been coming.

“Long time ago, all the beach used to be covered with driftwood and then today it doesn’t do that anymore” (Joseph Smart)

Logs are rather long with large diameters. However those left on the beach often lack their root system and are partly embedded in sand. It is probable that the wind rapidly covers the logs with sand if they are left uncollected. Collection of good newly delivered wood seems rather instantaneous. Some logs have bark still attached to their trunk, which marks their nearby origin along the Yukon River.



Hooper Bay driftwood. A willow log with bark. Photograph by Claire Alix

Interestingly most logs had been checked for dryness and bore a notch made with an axe.



Wood pile with logs bearing the check mark. Photograph by Claire Alix

Logs considered too waterlogged are left behind on the beach and get embedded in the sand. On several occasions, we observed logs that had been “processed” *in situ*. Small planks or stove-length pieces of wood had been split and/or cut from the trunk, directly on the beach. The lower half of the log, probably too waterlogged, was left behind.



Two examples of “on the spot” driftwood processing. Photographs taken by Claire Alix

People of Hooper Bay collect their wood all the way to Cape Romanzof, right along the mountain and down to Hazen Bay (Joseph Smart).

- Past Usage of Driftwood

While driftwood is still essential today for heating homes and firing up the steam bath, It was once crucial for making a large variety of tools and implements. Without good quality wood many of the daily subsistence activities could not have been pursued. Driftwood was used for making house frames, kayaks, umiak and sleds and fish traps as well as many utensils such as ladles and bowls. Contrary to Togiak, which has access to standing timber, driftwood in Hooper Bay was the main source of wood.



Ladles made of driftwood, meeting at the Hooper Bay Tribal office, August 2003.
Photograph by Laura Weaver

As Martha Kopanuk told us, wood was carefully looked for and a man could spent an entire day looking for the types of wood he needed to work on. Logs used to be collected on or near the beach and towed by kayak.

Kayak frames were made from driftwood and many of the different pieces were carved out of stumps. “Mimernat”³ (stumps) are considered the hardest part of the wood (Joseph Smart). David Zimmerly who visited Hooper Bay in

³ We used the Spelling from Jacobson 1984 “Yup’ik dictionary”.

the late 1970's to record traditional kayak building, reports that owning a good kayak was essential for subsistence and social purposes (Zimmerly 1978: 29). And yet, without suitable wood, a man could not build a good kayak and subsequently could not acquire food, wealth and family.

Blackfish traps used to be made out of "unarciaq", a long straight piece of driftwood. A large variety of names existed for the different types of wood based on the wood properties and what the wood was to be transformed into rather than on the wood species (Martha Kopanuk, Joseph Smart see also Jacobson 1984).

Old rotted wood was kept to heat houses because it was not suited to make things. Carvers and hunters used to go out looking for the wood they needed. They did not wait for new wood to come in, and when they wanted to build or make something they would go down the beach and start looking for the right wood.

Summary: Hooper Bay has a tremendous reserve of driftwood, which is dependent upon annual deposition coming primarily from the Yukon River, and is strongly influenced by northwest winds and storms. Given the number of craftsmen and availability of wood, this is a community that could substantially increase its production of wood carvings if markets were developed. Driftwood provides a very important source of fuel for heating homes in the community and is estimated to offset at least half of the heating fuel costs.

Scammon Bay:

Scammon Bay lies approximately 1089 miles northwest of Anchorage. The village, flanking the Askinuk Mountains, is located on the south bank of the Kun River, about 1 mile from the Bering Sea. The Bay of Scammon is protected by two elongated barrier islands (Neragon and Krekatok Islands). The water within the bay is quite shallow and the Bering Sea is reached by following a narrow channel.

- Population: 491 (2002). 97.4% are native Alaskan (2002 - DCED Certified Population)
- Unemployment rate: 12.8% with 56% of all adults not in the work force. The median household income was \$25,625, per capita income was

\$7,719 and 37.6% of residents were living below the poverty level. (2000 U.S. Census)

- Fuel oil cost estimate: \$3.15/gallon without tax. (November 2003 Personal Communication with Louisa Walker.
- Stoves: It was estimated that about half of the houses in the village are heated with both oil and wood burning stoves. The typical consumption rate is about 5 gallons of heating oil for 2 to 3 days.



Aerial view of Scammon Bay, August 2003. Photograph by Bob Wheeler

Scammon Bay is located in an area where driftwood is not immediately available. Driftwood is accessible by boat in the summer and snow machine in the winter, but wood is mostly collected in the winter when it is easier to access. Typically, firewood is collected north along the coastline in the direction of the Black River. In the winter, people often travel up to twenty miles to get wood. Some driftwood can also be found in the south towards Cape Romanzof although the sea is often much rougher in that direction.

The community of Scammon Bay uses driftwood for firewood in the wood stove, the sauna bath and the smoke house. As in every other village, drift cottonwood is used for smoking fish but sometimes local willow or alder bushes are an alternative. No real preferences are given as to which species to burn for

home heating as long as the wood is dry. Driftwood collection is usually done by the individual households and is not sold as a commodity. As in Hooper Bay, many houses have piles of driftwood resting against or adjacent to the house. It appeared that perhaps less wood was being used in Scammon Bay than in Hooper Bay. However this impression could be related to the different size of the two communities as well as the more direct access to large amounts of driftwood in Hooper Bay.

A variety of items are also made out of driftwood including fish traps, ladles, carvings, and masks.



Masks carved by Felix Walker. Photographs taken by Laura Weaver

Several artists and craftsmen carve with driftwood. In Scammon Bay, objects such as bows, snow goggles and fish traps are still being made out of driftwood.



Xavier Simon with his driftwood made fish trap. Photograph by Claire Alix



Snow goggle made of spruce driftwood by Felix Walker's son, Scammon Bay 2003.
Photograph by Laura Weaver

-People interviewed in Scammon Bay

Xavier Simon, 72 years old, is an ivory and wood carver

Felix Walker is an ivory and wood carver.

Felix Walker took us to his fish camp in a nearby bay to look at driftwood accumulations and talk more about the resource.



Felix Walker discussing wood carving (left) and interior of smoke house (right).
Photograph taken by Claire Alix

- Driftwood Assessment in Scammon Bay

As in Hooper Bay, sources of driftwood logs are primarily coming from the Yukon River system. Wind and storm patterns influence their arrival and deposition in the area. A north wind brings driftwood, otherwise it goes to Norton Sound. In 2003, little driftwood came after breakup while 2002 was a good year (Bruno Kasayuli Sr.). The three years preceding 2002 had also been low years in terms of driftwood (Felix Walker). As noted previously, year to year variations are frequent in the delivery of driftwood.

Species composition is similar to what was noted in Hooper Bay. White spruce predominates in the accumulations followed by cottonwood and willow. However some southeastern Alaska species seems to reach the area from time to time. Among the firewood pieces stacked on the side of Xavier Simon's house, we found a piece of hemlock (*Tsuga sp.*) and Felix Walker mentioned some "perfumed wood" that he finds once in a while. This "perfume wood" is likely to be either red or Alaska yellow cedar.

- Past usage of driftwood

Past uses of driftwood in Scammon Bay are very similar to Hooper Bay. It was indeed “the main source of life” (Xavier Simon) and was used for building house frames, kayak frames and dog sleds, as well as bowls, ladles and a large variety of everyday items.

Bent wood bowls were made with two different kinds of wood. The base was carved out of a stump (nasqunaq) while the side, a piece of plain straight grained wood (unarciaq) was bent with heat. The base was then forced into the rim of the bentwood side. Seal oil and blood were used to stain the wood (Xavier Simon).

Unarciaq was also used to make fish traps and other items. It seems to have been the wood that was the most looked for. However, stumps were also largely used. As Felix Walker said “the body of the tree is crackable but the root is uncrackable.”

We found that Yup’ik knowledge of wood, driftwood and traditional wood working is remarkably alive and is transmitted to the younger generation.

Summary: Although driftwood deposits in Scammon Bay are not as accessible as they are in nearby Hooper Bay, driftwood is highly used in the community for firewood and for arts and crafts by a relatively large number of local craftsmen and artists. Artists and craftsmen seem to be somewhat organized in Scammon Bay and a list with their specialties is available on line at

<http://www.ankn.uaf.edu/Marshall/scammonbay/ArtsandCrafts.html> (list reproduced below).

Due to the relatively remote location of the village, the development of a centralized marketing and sales cooperative may be of interest to the community and may work to enhance the value-added driftwood carvings produced in the Scammon Bay area.

Driftwood is a very important fuel resource and at \$3.18 per gallon of heating oil, it can make a substantial savings in the winter heating bills, perhaps as much as \$1,000 per household. Scammon Bay seems to offer good opportunities to further enhance utilization of driftwood resources for value added products.

Arts and Crafts people of Scammon Bay

From <http://www.ankn.uaf.edu/Marshall/scammonbay/ArtsandCrafts.html>

Ivory Carvers - Xavior Simon, Mike Utteryuk, Willie Kasayuli, Gary Hunter, Felix Walker, Ole Hunter

Wooden Spoons- Xavior Simon, Mike Utteryuk, Willie Kasayuli, John Henry, Gregory Strongheart, and some others.

Uluaqs- Nathan Kaganak, Mike Utteryuk, Gregory Strongheart, Willie Kasayuli, Felix Walker, Lars Hunter

Wooden Masks- Willie Kasayuli, Mike Utteryuk, Felix Walker

Harpoons ,Spears- Mike Utteryuk, Gregory Strongheart, Felix Walker, and most of the men in town.

Sled Builders- Bruno Kasayuli, Dan Akerelrea, Mike Utteryuk, and most of the men in town.

Boats - Herring Fish Boats- Sabastian Kasayuli and some others.

Regular boats- Almost every man in town.

Snow Shoes - Some of the men in town.

Basket Weavers - Mary Ann Sundown, Mamie Ulak, Lucy Akerelrea, Dorothy Kasayuli, Mary Utteryuk, Alice Amukon, Lizzie Strongheart, Lydia Yunak, Selma Walker, Dorothy Tunutmoak, Leota Sundown, Gemma Hunter, Agnes Aguchak, Norlita Hunter, Elizabeth Hunter, Rosalie Hunter, Anna Marie Tungwenuk, Caroline Ulak, Evelyn Ulak, Betty George, Angeline Amukon, and some of the high school students.

Grass Doll Makers : Lydia Yunak and Mamie Ulak

Conclusions: (based upon the four villages visited)

Today, in coastal communities of Southwestern Alaska, driftwood is still a very important economical and cultural resource. Although each community visited showed differences in term of quantity and types of wood available and access to accumulations, there are some consistent uses, such as smoking fish with cottonwood. Likewise, in the Yup'ik area, driftwood is uniformly used in

the sauna bath. While any dry wood is good to burn, spruce is often preferred. In Togiak, several people told us that they hang cedar wood in the steam bath for the pleasure of its smell.

In addition, some craft items are made from driftwood but limited marketing and sales opportunities have constrained their economic impact. Moreover several of the people we met were carving and making crafted objects as a pleasurable activity. They showed interest in an organized cooperative where they could expose and eventually sell their art pieces. Traditional implements were still made in Hooper Bay and Scammon Bay such as spoons, masks, and dolls. These communities showed a tradition of carving that is transmitted from generation to generation and interest and participation is found within this young generation.

In the four visited communities, residents seem to have observed that driftwood arrival has declined in recent years. Yearly fluctuations are caused by conditions of storms, winds, and currents. The exact relationship between change in climate and change in driftwood transport and delivery remains unclear, however variation in winter snow precipitation and breakup conditions affect wood transport down river and ultimately its delivery to the coast. The amount of wood supply that comes to the communities each year after breakup is important to the annual collection of driftwood and for their home heating capacity. Thus unfavorable storms and winds can cause substantial loss for the year and push people to increase the distance traveled to get wood. Calculation between costs of heating oil and gas for the snow machine are also taken into account.

Along the south coast of the Alaska Peninsula and in the Aleutian Islands, most of the wood come from the spruce-hemlock forest of Southeastern Alaska. Communities of the Bristol Bay region are mostly dependent on supplies of driftwood from large rivers such as the Kuskokwim and the Yukon and receive only occasional logs from Southeastern Alaska. On the other hand, communities located south of the Kuskokwim Delta such as Togiak have not been traditionally dependent on driftwood and typically collected a large part of their wood resource upriver. This shows how wood resource procurement was locally adapted.

Driftwood collection has changed considerably from earlier days before snowmachines and ATV's. On Unga Island for example community based collection of driftwood changed following WWII and became a more individual activity. In Hooper Bay and Scammon Bay, driftwood used to be towed by kayak or dog sled in the winter.

Occasionally some people in the communities have been selling wood but it does not represent a significant source of income. We met several highly

skilled craftsmen and women whom were using driftwood. However sales need to be developed in order to provide enduring and substantial economic impact on the region. Training in marketing would need to be provided and people showed interest in such a project. Distribution channels would also need to be organized, probably on a regional basis, in order to develop an economically viable craft industry with driftwood. However, considering the possible decline in wood delivery and the importance of driftwood as a source of heating, attention should be focused on the necessity to develop the use of driftwood in a sustainable manner.

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