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Into the Headwaters: A Nunamuit Ethnography of Fishing

Final Report for FIS Study 02-050



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ABSTRACT

The Nunamiut Iñupiat of the north-central Brooks Range are one of the few Alaska Native peoples for whom fish played a relatively modest role in their overall subsistence resource base. Despite the fact that they are one of the most studied peoples in the nation, relatively little attention has been given to Nunamiut fishlore, perhaps precisely because of this unusual status.

This report, therefore, attempts to at least partially remedy the oversight, by corraling and compiling otherwise widely scattered and incidental information on fishing practices that was previously collected by earlier researchers and observers, with some original research of the present writer.

By virtue of the author's background as an archaeologist and an inherent bias towards material culture, the heaviest attention is given to descriptions of traditional fishing technologies and techniques. Nevertheless, considerable attention is also given to characterizing the physical environment in which the Nunamiut live and its impact upon their fishing practices, both past and present, as well as tracing shifts in fishing emphasis, activities, species, and areas through time. Also finding a place within are treatments of traditional methods of storing, processing, and preparing fish as well as a glimpse of their role in the Nunamiut oral tradition.

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I. INTRODUCTION

Ever since coming to the attention of the scientific community in the late 1940s, the Nunamiut people of Anaktuvuk Pass have, over the past five decades and more, had a history of close cooperation with visiting scholars and researchers. As a result, they have, in their own unique and substantial way, made some very valuable contributions to the world's knowledge and understanding of the arctic environment in which they live. It is no exaggeration to say that quite a number of first rank scientists from a variety of fields of inquiry—anthropology, archaeology, botany, biology and others—have come to not only study but to actively learn from these patient, perceptive, and insightful people.

While at first glance, it might seem that scarcely an unturned stone remains in the voluminous studies of their traditional ways, one of the least-examined topics concerns their knowledge and long standing involvement with fish and fishing. Thus John M. Campbell's succinct and decades-old observation that "little systematic ichthyology has been done at Anaktuvuk Pass" rings as true today as it did when first made forty years ago (1962:94). Doubtless there will be those who maintain that the present work has done little, if anything, to change that.

Even after all the scientific inquiry conducted in Anaktuvuk Pass, it is apparent that those few researchers who have turned their attention to even a rudimentary examination of either biologically or culturally based Nunamiut knowledge of fish can be quickly counted on the fingers of a single hand, if not, strictly speaking, the joints on a single finger.

Perhaps the earliest was Vladimir Walters, who spent some time working on the Arctic Slope in the late 1940s. In 1955, he produced a volume entitled *Fishes of Western Arctic America and Eastern Arctic Siberia (Taxonomy and Zoogeography)*, which enumerated the fish species of the North Slope and Arctic Region, with occasional reference to traditional Nunamiut knowledge and use.

The first person to have produced a more focused coverage of the Nunamiut and fish was John Martin Campbell, who began working among the people of Anaktuvuk Pass as early as 1956. An archaeologist by profession, naturalist by inclination, and inveterate angler by avocation, Campbell's lifelong preoccupation with fish and fishing, coupled with his examination of cultures and their adaptation to arctic landscapes, led him to produce perhaps the most thorough and perceptive, though brief examination of the Nunamiut and fish in existence to date (Campbell 1962).

Campbell's involvement with the Nunamiut people began in the summer of 1956 as part of a Yale University expedition to Chandler Lake. Between then and 1967, he pioneered archaeological research in the Anaktuvuk Pass area, making a number of significant finds. He also became fascinated with the Nunamiut and their way of life, spending a great deal of time

traveling with and learning from them. It was his, or perhaps our, good fortune that he found a way to combine some of their fishlore with his own penchant for fishing and keeping meticulous notes on his catches. Thus much of the information regarding fish and fishing in the Anaktuvuk area is drawn from his notes and his unpublished 1962 doctoral dissertation, providing a very solid base for future researchers to build upon.

After Campbell, the next, though fragmentary, contributions are to be extracted from Nicholas Gubser (1965) in his excellent ethnography of the Nunamiut, based upon his fourteen months spent among them in 1960 and 1961. Some additional incidental nuggets relating to these people and fish can also be gleaned from Ingstad (1954), Irving (1964) and his unpublished 1951 field notes, Helge Larsen's unpublished 1951 field notes, as well as Amsden (1977) and Binford (1978), among others.

From a more formally biological perspective, the literature on North Slope and Brooks Range fisheries increased in the early to mid 1970s as a number of joint State of Alaska/federal fishery studies were done to gather baseline data in advance of construction of the Trans-Alaska Oil Pipeline. In more recent years some U.S. Fish and Wildlife and National Park Service research projects were conducted at various locations around Gates of the Arctic National Park and Preserve, including studies at Itkilik and Chandler Lakes.

Finally, beginning in the mid 1980s, I began to focus my attention upon previously under-reported or undocumented aspects of Nunamiut culture as part of a North Slope Borough funded Survival Skills Project. Thus much of the data concerning traditional fishing methods and technologies that appears in this ethnographic sketch of Nunamiut fishing lore was recorded, though never compiled or published, at that time. This, though, has begun to change as these materials have come to the attention of resource managers from state, local, and federal agencies who are in need of information. Therefore the resources of the Simon Paneak Memorial Museum, where this material resides, were called upon to make this data available in a useful and informative manner.

II. METHODOLOGY

Recently the Paneak Museum has collected new data in cooperation and conjunction with project staff in the employ of the City of Anaktuvuk Pass.

Our primary charge was to research and produce an overall accounting of traditional Nunamiut fishing lore, practices, technologies, and environmental knowledge as well as the underlying cultural values from which they stem. Specific topics of inquiry and documentation include

- the nature of the physical environmental setting, the areas fish species inhabit, and their preferred habitat;
- a tracing of the importance of fish in relation to other resources through time and space, noting how it may have changed with reference to areas of human habitation, as well as by species;
- recording traditional ecological knowledge concerning the various species of fish of importance to the Nunamiut;
- mapping fishing localities, both past and present, in the north-central Brooks Range and Arctic Foothills provinces, recording the availability of species, the seasonality of harvest and the methods of take;
- detailed accounting of traditional fishing methods and technologies;
- methods of preservation and preparation, both past and present; and
- oral traditions and cultural values associated with fish and fishing.

In addition to these research questions specifically tasked to the museum, our cooperative relationship with the City of Anaktuvuk Pass also involved providing their staff with access to research data and references from the museum library as well as technical aid and expertise in building their interview skills for conducting ethnographic interviews with village elders.

The museum also helped take a lead in interviews regarding the locations of traditionally significant fishing spots. Again we built upon an already existing catalog of data collected under the auspices of the North Slope Borough over the span of nearly 25 years. What new data we were able to record was collected in interviews that began by defining the cultural landscape in which these specific localities occur, particularly through the recording of place names of prominent and defining physical features such as mountains, valleys, hills, rivers, creeks, streams, lakes, and the like. Once the researchers had a working knowledge of the landscape, then specific fishing localities were documented, drainage by drainage, from east to west, working downstream from the headwaters of each to the endpoint of known fish resources.

Interviews about these physical landscape and fishing localities were recorded on 90-minute cassette tapes. Most interviews were conducted in English, but when specifically requested they were done in Iñupiaq with the aid of interpreters. Specific data on fishing localities was recorded with the aid of prepared matrix-like forms that included such data points as the name of the locality, the map quad, the physical setting of the locality, the species of fish and their seasonal availability, water conditions, and technologies employed.

In the effort to record some very specific information on particular fishing localities, I have elected to identify each particular fishing locality and whenever possible to provide whatever correlation there may be between that locality and any seasonal association of specific species of fish. For example, at Chandler Lake we documented numerous different fishing localities, each one specific to season(s) of use, technology used, and the species most commonly taken there.

However, in the interest of protecting the confidentiality of the community's prime fishing localities, such data remains under lock and key in the museum, with additional copies at the city offices. In its stead we have, for the purposes of this report, portrayed only the general location of any particular fishing locality by dots on maps of sufficiently large scale as to effectively shield the locations from curious, covetous, or potentially unwelcome eyes.

It was anticipated, at least from the ethnographic standpoint, that the current research project would present an ideal opportunity to not only flesh out information previously recorded nearly 20 years earlier, but to add to it as well, filling in gaps, elaborating upon lightly covered topics, and more completely exploring the social and cultural contexts in which fishing activities have, and continue to be, carried out over time.

Unfortunately we have only partially fulfilled our expectations, because the level of community participation in the interview process was much less than hoped for. Part of the challenge lay with demography: the inevitable passing of time and elders that has thinned the ranks of those who came of age in the nomadic era when an intimate knowledge of the land was essential to survival. As a result there remain only a handful of men and women thoroughly schooled in the types of knowledge we sought. To this, one must then factor personality, inclination, and capacity. Of those few who can contribute, one is burdened by poor eyesight which seriously impacts his ability to work with maps, another who for many years has been quite forthcoming and generous in sharing what he knows, now has a hearing problem that makes working with him both taxing and time consuming. Another is a very knowledgeable but modest and self-effacing man who expressed a willingness to work with us, but only in the company of another equally well-versed contemporary.

Unfortunately this fourth individual remains, as he always has been, elusive. He is, by some quirk of nature and personality, one of those very rare and select individuals capable of trying the patience of even the imperturbable Job himself. In fact, in view of his unstinting stingingness, he quite readily brings to mind the old, and in other circumstances quite comforting, biblical passage: "Jesus Christ, the same yesterday, the same today and the same forever more." Appropriate emphasis may be placed at the perceptive reader's discretion.

Ethnographers, both veteran and neophyte, have over the years come to know this particular walking encyclopedia of traditional knowledge as a man who President Bush might characterize as someone who does not "mis-underestimate" his own self worth. Apart from feeling he should be paid no less than twice the going rate, he could never be pinned down to a specific time and place for an interview, and in his absence we remained unable to secure the services of the first elder who was unwilling to work without his counterpart. As one might readily appreciate, the charm and novelty of this arctic "Alfonse and Gaston" routine was about as brief and fleeting as

the arctic summer itself, and in the end led us to simply eliminate them from the interview process, or perhaps more precisely, led them to eliminate themselves.

Well, this is nothing new to anyone engaged in this particular, and sometimes peculiar, line of work such as ethnology is. It is simply an occupational hazard.

We were also seriously hamstrung by our inability to secure the long-promised copies of C.W. Amsden's original and voluminous field notes pertaining to the topic at hand. Unfortunately, as fine a fellow as he is, and despite numerous assurances he would get the data to us, Charlie made a permanent move to Australia before getting around to digging them out of storage and sending them along. Thus some vitally important information on site locations and species availability was not to be had. As a consequence much of the contextual information regarding shifts in fishing practices was winnowed from previously published sources, which only hint at the richness of detail that undoubtedly lies behind what was presented in largely statistical fashion.

As regards the methodology involved in the collection of traditional ecological data, we took, of necessity, something of a back-door approach. Faced with the situation described above of limited elder participation, we instead drew upon already existing information recorded on tape and in writing from as long as 30 years ago. This data ranged from Paneak's personal reminiscences recorded for Campbell in the early 1970s to interviews with Arctic John Etalook and Elijah Kakinya done in the mid 1980s and other incidental interviews with other Anaktuvuk Pass elders in the 1990s. Additional nuggets of data were gained from the written record such as Gubser (1965), Paneak's own unpublished journals and others, as well as my own personal experiences, observations, and reflections accumulated over a span of nearly 30 years in the community.

It is important to note at the outset that none of the interviews I did before the start of this particular project were ever specifically aimed at eliciting information about traditional ecological knowledge. Rather, I was able to draw upon relevant information that incidentally emerged in the course of those earlier interviews that touched upon those issues.

For example, the work with Arctic John Etalook, funded by the North Slope Borough Commission on Iñupiat History, Language, and Culture (IHLC), was originally envisioned as a land-use study aimed at recording the history, territories, seasonal rounds, settlement patterns, place-names, habitation, and subsistence sites of a virtually overlooked band of Nunamiut: the Ulumiut of the Ulu Valley and upper Itkillik River drainage. Once the cultural landscape of their traditional lands were defined, we then set about tracing a season-by-season, year-by-year travel history of Etalook's family. Through this effort we came to record personal accounts of survival by fishing, of similar stories he had heard from others, of specific fishing localities along with the how and why they were discovered, of aspects of fish behavior, of the significance of the timing of beginnings or endings of fish runs as cues to the initiation other sorts of activities, and the like. In the course of this work we also took some lateral arabesques into traditional technologies that yielded some interesting details on the making and use of fishing implements.

Upon completion of the Ulumiut project, the IHLC Commission was sufficiently pleased with the quality and level of detail that Etalook was able to provide that they elected to fund further

research with him, research that became the Nunamiut Survival Skills Study. Largely conceived as a salvage ethnography, it was designed to record, in fine detail, the types of knowledge and practical skills of survival that were possessed and practiced by the Nunamiut people at the end of the 19th century.

This work was deemed both worthwhile and necessary because, despite the heavy ethnographic and archaeological attention that had been lavished upon the Nunamiut over the previous half century, most of the information about them, while fascinating in the extreme—well, to me anyway—was rather general in nature. A reading of Gubser's work published in 1965 is a case in point. There was so much more to know about any one of the many, many topics that he so skillfully discussed. The work was also deemed to be practical, as at the time there were at least two men still alive, Etalook and Kakinya, who had been born before 1900, as well as a number of other elders born in the 1920s and early 1930s who had been raised and taught by such men and who had grown up using those very same skills throughout their own lives.

Naturally enough, with my training as an archaeologist, rather than as an ethnographer, I brought certain biases to my approach to this work, foremost among them a fascination with stuff, and things, known to some sophisticates as technology and material culture. In addition, my fascination with the hows and whys of the making and the practical skills required in the employment of these implements led me in specific directions—straight into the arms, figuratively speaking, of Franz Boaz and the much-imperiled descriptive ethnography. Thus even the most casual reader cannot help but notice that of all the topics covered in this report, the greatest detail and in-depth coverage is lavished upon the traditional technology section. If there is a chance for any particular portion of this report to stand as the definitive record, this could be it, because I have plumbed the depths of this topic to the limits of my ability—and it must be said—the patience of the community.

The work on the Survival Skills project began with Arctic John Etalook in 1982 and continued on, somewhat erratically because of his declining health, until his passing in the spring of 1984. Topics ranged from ethnobiology, botany, meteorology, and pharmacology to traditional clothing and technologies and practices of travel, shelter, hunting, trapping, and of course, fishing, as well as touching upon the logistics of the nomadic lifestyle of a hunter-gatherer society based upon the hunting of caribou. Among his most interesting contributions were those pertaining to the logistical aspects of the Nunamiut lifestyle, from which emerged some useful and interesting information on fishing.

Interviews with Etalook were done in the Iñupiaq language, with the aid of an interpreter, which in nearly every instance was his daughter Louisa Riley. Preparation for each interview topic involved extensive background reading of previously documented information about the intended subject. This assured that I was aware of what was already known and could therefore (I hoped) ask better, and more detailed questions as well as know where to focus fresh attention on vacancies in that pre-existing data. All interviews were done from prepared lists of questions, which I went over with my interpreter before the interview.

We were also extremely fortunate in being able to secure the services of a ranger/pilot and a floatplane from the National Park Service in order to take Arctic John, his daughter, and myself up to the Ulu Valley for some three days of overflights over traditional Ulumiut territories.

Through this we were able to locate, from the air, any number of traditional fishing localities previously mentioned and mapped in our interviews, as well as to visit and sample a number of fishing localities around Itkillik Lake, where we were based. It was in this setting we learned about where the lake trout like to feed upon water snails, and how this was a reliable spring fishing locality.

After Etalook's death, the project was relocated to Anaktuvuk Pass and I began working with Elijah Kakinya, Etalook's contemporary and cousin. It was at this point that we began to focus systematically on fishing-related topics. With Kakinya we covered the handcrafting and use of dip, seine, and gill nets, gaff-hooks, hook and line jigging, the large fish trap, the fish spear, as well as the preservation and preparation of fish for food. We also had plans for detailed coverage of key fish species, their life cycle, and their ecology, but unfortunately by the time we began this particular set of topics Kakinya was beginning to feel the early effects of Alzheimers, which impaired his memory, thus this was not pursued.

The interviews with Kakinya, like those with Etalook, were done in the Iñupiaq language with the aid of an interpreter. They too were done from a prepared set of questions, based upon extensive background reading to assure full coverage. In addition, the interviews about specific technologies were conducted with the aid of drawings taken from other sources, such as Murdoch (1892) and sketches that were done by him and myself and annotated as they were compiled. Discussions involved basic descriptions of the items, the materials and practices used to make them, their Iñupiaq nomenclature, and how they were used. In two instances, discussions were aided by models of a large fishtrap and by a full-scale fish spear that he made.

Over subsequent years, some additional data on traditional fishing methods were compiled with the aid of Justus Mekiana, who provided fuller information about the making and use of the fish spear as well as the small one-man fish trap. The interviews with Mekiana about these topics had the advantage of being conducted wholly in English and in constant reference to actual items he had made, so we were able to discuss in detail the materials used and where they were obtained, and the step-by-step process of manufacture. Mekiana named the various pieces, parts, and processes and discussed described, and to a limited degree, demonstrated how they were used, accompanied by sketches of how they were deployed.

These, then, collectively represent the primary human sources and types of information that were drawn upon and integrated into this report. Unfortunately, they do not even begin to add up to a comprehensive portrait of traditional ecological knowledge about fish but instead represent an amalgamation of illustrative vignettes and tidbits that hint of much more that lies beneath the surface.

Perhaps somewhere along the line I managed to unwittingly offend the Fish Spirit, the *Iqaluum Kanja*, and as a result she is obscuring the information I seek, much as she hides her face behind her thick and flowing hair and from time to time deliberately withholds fish from the unworthy. Well, as they say here in the far north, "*qanulaitchuq*," it can't be helped.

On the positive side of the ledger, efforts aimed at land use mapping and the recording of traditional and contemporary fishing localities went relatively well, and we were able flesh out some interesting information on traditional technologies and practices. Despite all the

challenges, disappointments, and vexations that come with this kind of work, I still feel as though we have made a solid contribution to the ethnographic record regarding Nunamiut fishing and fishlore and at least a modest one to the subject of traditional ecological knowledge.

Elder Biographies

By the very nature of what amounts to be something of a salvage ethnography of traditional fishing practices, patterns, methods and technologies, the intimate involvement and contribution by knowledgeable elders has been absolutely fundamental to whatever degree of success we may have attained in trying to recapture this information. In this particular instance we were extremely fortunate to be able to draw upon the vast recorded experience of some remarkably well-versed people born at or just before the beginning of the 20th century, as well as some significant contributions from our present-day elders, both men and women, who themselves learned first hand from these older men and their contemporaries.

In the spirit of providing what is hoped to be at least a dash of additional context to the information presented in this report, it seems appropriate and worthwhile to offer pocket biographies of three senior elders from whom so much was learned and recorded. While some people might also wish to know something about our contemporary elders who contributed to this work, we have opted not to do so, largely in deference to their privacy. In the case of those elders who have long since stepped off into the great beyond, they now belong to the ages and the historical record. Thus no great damage to their privacy is at risk.

Our three key contributors of that now ancient age, all born in or before 1900 are Simon (Panniaq) Paneak, Arctic John (Itaalluk) Etalook and Elijah (Kakiñña) Kakinya. Gentlemen of the first water all, Paneak is undoubtedly the best, or at least most widely, known of the group.

Simon Paneak



Figure 1.
Simon Paneak.

Photo courtesy and copyright Helge Ingstad.

Simon Paneak (1900-1975) was born in the spring of 1900 near the mouth of the Killik River valley of the northern Brooks Range, a mere 15 years after the first outside explorers reached this area in the winter of 1885-86. He was the youngest of six children born into the tradition of a highly mobile big game hunting society, based upon the hunting of caribou.

Over the first few years of his young life, Simon was a witness to one of the most turbulent periods of Nunamiut history as his people were repeatedly struck by famine and epidemics and profound social disruption, so much so that the society into which he was born effectively collapsed and ceased to exist, forcing his family and many others to find refuge along the Arctic coast. There he remained throughout his late teens until his mid to late 30s, when he became part of the movement of a handful of Nunamiut families to resettle the interior. There they reestablished and followed their former nomadic way of life until the early to mid 1950s, when the present day community of Anaktuvuk Pass began to be established.

One of the more remarkable events in which Simon took part is what I have called The Last Great Hunt. In the summer of 1944, faced with the threat of arms and ammunition shortages due to the demands of the Second World War, a small group of six families returned to the ways of their forefathers, building qayaqs, fashioning spears, and driving herds of caribou into a lake where hunters set upon them with lances. They succeeded in securing a bounty of fat meat and skins with which to begin the coming winter, while at the same time conserving valuable ammunition. It was the first such hunt to be conducted since before 1900 and the last since then.

Beginning in the mid 1940s Simon worked with a wide variety of scientists: botanists, biologists, geologists, archaeologists, and anthropologists among them. An intellectually gifted man of enormous charm and knowledge, his contributions to the efforts of these visiting scientists led to his being credited as co-author on at least three published research papers.

Paneak's particular contribution to the present work is derived from a variety of sources, but primarily from oral history accounts and drawings he did for researchers such as John Martin Campbell, as well as his own writings and journals which contain additional invaluable drawings and information. From Simon's reminiscences we can see how important fish were to his people in the days of famine. In his drawings we can review hand-made maps of known fishing holes, view diagrams of fishing gear, details of net mesh size, and illustrations of various fishing practices in action. His cumulative contribution to knowledge of the old Nunamiut way of life is considerable.

Arctic John Etalook (Itaalluk)



Figure 2.
Arctic John Etalook.
Photo courtesy and copyright Grant Spearman.

Arctic John Etalook (1895-1984) was born in the spring of 1895 and grew up in the Ulu valley area of the north-central Brooks Range. Like Paneak and Kakinya, he too led the life of a nomadic caribou hunter, survived the famines and epidemics of the early 20th century, endured a period of exile from his beloved mountains, and eventually became part of the movement of Nunamiut families back to their traditional homeland.

Arctic John was a very knowledgeable, dignified, and self-sufficient man who, throughout his long and remarkable life was repeatedly mentioned in books and the popular press. He and his parents were initially encountered by Vilhjalmur Stefansson, the noted arctic explorer, and were mentioned in his early reports. Over the winter of 1913-14, while trapping and fishing along the arctic coast, the family played host to Diamond Jenness, the later famed anthropologist of the Canadian Arctic Expedition. They appeared in both Jenness' field notes (published in 1991 as *Arctic Odyssey*) and his popular book *Dawn in Arctic Alaska*, published in 1959. In 1929, Arctic

John and his parents were encountered in the mining community of Wiseman by Robert Marshall, who wrote about them in his book *Arctic Village*. Not long after they went north again to the Colville River delta area until finally they returned inland to stay in the early 1940s. As recently as the late 1970s he became quite well known throughout the state of Alaska for blockading the Trans-Alaska pipeline haul road because of the pipeline's unauthorized crossing of his Native allotment. A subsequent lawsuit also brought him some national attention in regards to the Native rights movement.

From the mid 1940s through the early 1970s, Arctic John continued living in and around the community of Wiseman until ill health prompted him to move to Fairbanks for the remaining years of his life. There, in 1980, this researcher met him and struck up a close personal and professional friendship that lasted until his death in the spring of 1984. During those four years we worked closely to document the history of his people, the Ulumiut, a little-known band of Nunamiut from the Ulu valley. Together with his daughter Louisa, we recorded in excess of 200 hours of taped interviews, which was funded by the North Slope Borough Commission on Iñupiaq History, Language, and Culture. It was in this wonderfully rich and detailed trove of information that certain details of Nunamiut fishing activities, practices, and technology were recorded, but only with the preparation of this report has this information seen the light of day. Etalook provided information mostly about hook and line fishing with various incidental details on fishing lures, some information on the use of gill nets, some useful traditional ecological knowledge, and some rich accounts of the logistics of fishing for survival.

As a final point of interest, readers might find it fascinating to know that Arctic John's considerable backlog of experience in fishing was not limited to traditional methods and techniques alone. He was also a practiced dry fly fisherman, a skill passed along to him through his long association with the old-time gold miners of Wiseman, as eclectic a congregation of men as one could ever hope to meet.

Elijah Kakinya (Kakiñña)



Figure 3.
Elijah Kakinya.
Photo courtesy and copyright Grant Spearman.

Kakinya (1895-1986) was a character. No other word fits him. He was born in the spring of 1895 at Tulugaq Lake, near the mouth of the Anaktuvuk valley, and like his cousin Etalook and his friend, contemporary, and eventually son-in-law Paneak, Kakinya saw and survived all of the tumultuous days of the late 19th and early 20th centuries. He too was part of the Nunamiut resettlement of the Brooks Range. A widely traveled man, he is even said to have mastered the Gwi'chin language and was thus able to communicate with the Athapaskan people he met around Arctic Village, Fort Yukon, and the Old Crow area in Canada. It also bears mentioning that Kakinya, like Paneak, was a participant in the Last Great Hunt.

Some even say he was the last true Nunamiut shaman, and though he never admitted to it, he never went to any great lengths to deny it either. I suspect he rather enjoyed the ambiguity of the situation, generally coming across as a cheerful and charming old rogue who you might want to think twice about crossing. At minimum he was a damned sharp operator. He was usually credited with being an umialik, a rich man, but unlike most Nunamiut he put greater emphasis on

the active acquisition of wealth than upon its beneficent disbursement. As he once remarked to a researcher, while rapidly rubbing his thumb and first two fingers together in the universal gesture of low finance, “Allays gotta be little bit foxy; no foxy – money go way.” Well, damned little of it ever did once it came into his hands. Nevertheless, given his multiplicitous usurious ways, Kakinya was not without a certain raffish charm, and though he might at times be seen as a difficult character, when the chips were down, he usually came through, and with a little extra besides.

Despite his fascination with the modern conveniences and trappings of money, Kakinya was quite the skilled hunter and trapper, and he was as well schooled in the precontact ways of his parents and grandparents as any of his contemporaries. Thus he was a suitable subject for interviews on traditional life and technologies, including fishing, which this writer conducted, again supported by the History, Language, and Culture Commission. From this came several hours of interviews, descriptions, diagrams, and even implements pertaining to fishing technologies and practices that has yielded some useful data that was incorporated into this report. Among his much-appreciated contributions are details pertaining to hook and line fishing, construction and use of the fish spear, the larger fish traps, gill nets, seine nets, dip-nets, and gaff-hooks.

III. TRADITIONAL ECOLOGICAL KNOWLEDGE AND FISHING

The topic of traditional ecological knowledge is one that has gained great currency over the past 15 or 20 years, and numerous researchers have taken pains to define its nature. From my own perspective it represents nothing less than the totality of knowledge about the environment, both physical and spiritual, in which a people live. It encompasses both the seen and the unseen, the empirically based and the inferentially drawn, which when combined and viewed through the lens of their particular cultural tradition provides what is for them the best, or most appropriate, or most useful, or most reliable, or most productive, or most fulfilling knowledge, perspectives, insights or explanations of the natural and supernatural worlds, within which they move and upon which they depend.

The root source of virtually all such knowledge, in this instance about fish, is the product of direct observation that by and large has held up quite well under scientific scrutiny, as has been testified to by any number of scientists, including such esteemed biologists as Laurence Irving and Robert Rausch, who readily acknowledge that they themselves learned quite a bit about arctic wildlife under the tutelage of their Nunamiut guides and assistants. Both of these men have had distinguished careers and both enjoyed long personal and professional relationships with the Nunamiut people; Irving, a physiologist, was the first director of the Naval Arctic Research Laboratory in Barrow Alaska during the 1940s and 1950s and then established and oversaw the operation of the Institute of Arctic Biology at the University of Alaska Fairbanks as its director. Rausch is a world-renowned parasitologist who began his wide-ranging work in the arctic with the Nunamiut in the 1940s, initially with the U.S. Public Health Service then later with the Institute for Arctic Health at the University of Alaska Fairbanks and most recently as professor emeritus at the School of Medicine at the University of Washington in Seattle.

Like most hunting and gathering peoples, the Nunamiut possess, of necessity, a strong heritage as accomplished naturalists and keen observers of nature. It could hardly have been otherwise, for their survival demanded a complete and thorough knowledge of the environment in which they lived and the animals upon which they depended. Thus it should come as no surprise that it was common practice for hunters to routinely examine the stomach contents of fish to gain a better idea of what they are feeding upon at any particular time at any particular place. Such detailed examinations were only one of the methods they employed to compile a comprehensive natural history and ecological profile of various fish species, including such things as its travels, behavior, breeding patterns, spawning locations, favorite foods, favorite habitats, and how these might vary with the seasons or conditions, as well as of course the best methods and techniques of catching them.

The application of traditional ecological knowledge to the pursuit of fishing is a practice that goes far beyond the knowledge of good fishing holes and the skillful use of a handful of homespun but highly refined technologies. It is, fundamentally, a process that is broad in scope and that brings together a wide array of highly detailed and sometimes divergent knowledge involving the weather; snow and ice conditions; topography; lake, creek and river morphology; vegetation and habitat; fish habits, movement patterns, and even their nature.

Yet some of their ideas about fish, in the absence of direct observation, stem from inference or speculation that seem, at times, a bit wide of the mark if not downright fanciful, at least from the Western scientific perspective. In one classic instance that Gubser points out, “because fish are difficult to observe all the time, the Nunamiut were unable to figure out where some were at a given time of year. One variety of whitefish, for example, is known to migrate from the Beaufort Sea up the Colville River to some of its tributaries and return, but they seem to disappear from sight during part of their stay inland. Some Nunamiut believed that these fish disappeared into the ground for a short time” (1965:253).

Today in our own busy and contemporary times, with all of the modern technological conveniences such as snowmachines, all-terrain vehicles, ice augers, fish sonars, and scientifically tested and developed lures, there tends to be an overlay, a sometimes opaque carapace of modernity that largely serves to obscure from the casual observer much of the underlying environmental knowledge upon which the Nunamiut have long depended, and still employ today, to pursue their subsistence way of life.

The life of a hunter or fisherman, today as in the past, is at least one of far ranging mobility and wide-ranging observation. To make a living from the land one must know it intimately, understand it completely, and be able to apply this knowledge intuitively. This knowledge and understanding stems from two key sources, the accumulated knowledge of elders that has been refined, built upon, and passed on from generation to generation, and a person’s own direct observation and personal experience.

The Nunamiut are nothing if not pragmatic, practical, and empirical (Gubser 1965, Binford 1978). They are also excellent observers, quick learners, and agile thinkers. They have been conditioned and trained to be so, in part by the demands of the arctic environment, which allows few second chances, and in part by traditional teaching methods that are scarcely much less demanding than the environment itself but are tailored to teach swift mastery and self reliance.

From an early age, youngsters are taken out upon the land by their elders to learn the very basic skills of survival and the knowledge of the physical environment and the ways of the wildlife upon which they depend. Young hunters and trappers and fisherman are taught not simply to observe but to think about what they have seen, to internalize and integrate it, and most important to apply what they have seen before to new or novel circumstances and places. It is not considered enough for a person to be well schooled in the land with which he is most familiar; he has an obligation to himself, his family, and to

his entire group to learn about new areas as he travels through them and be able to report accurately upon them at his return.

For example, a man traveling through new country in summer would pay close attention to the landscape, learning and memorizing it along the way and building a map in his head that he and others can draw upon in the future. Among the things noted might be the locations of marmot and ground squirrel colonies, well-worn trails on the mountain slopes indicating the presence of mineral licks where sheep could be hunted, landscape features that might be useful in navigation, or willow stands offering potential shelter in extremely cold, windy weather. Also part of such a reconnaissance would be noting deep pools in rivers and creeks that offer potential winter fishing localities or shoals and riffles in a river that might indicate a danger of thin ice and therefore a winter travel hazard.

As Paneak himself once wrote to this effect:

In inland, north of mountainlines I been look for willows dry wood or more willows in anywhere I been in the country or any I go in so later when I am traveling with my family so I can always find better camping place perhaps because I made it knowing before that happen. Anywhere I go I can always my eye wide open and so I can remember spot in everywhere in the country when I need it, and some peoples cannot do that way because not enough experiment or think it might be around again in anywhere they seem foolish for themselves and when they need cannot remembered and only forgotten where they had seen. Same things with fishing place anywhere in country in north slope of Arctic in the rivers founded in same place from generation to generation no change to place to place. (Paneak n.d.)

An important part of this penchant for observation is preparation for changes in the environment. Nothing remains static, and variability in nature often runs in cycles longer than a human lifetime. Thus the collective folk memory—the oral tradition—of a people is vital to retaining and keeping current knowledge of things few have seen first-hand but that can recur over long periods of time. Despite any one individual's depth of personal, empirical, or experiential knowledge, there are inherent limits to how much can be learned first-hand by any one person. Knowledge, learning, and by extension wisdom is often collective, and taken collectively, is sometimes a direct result of chance, of one person being at the right place at the right time to witness an unusual though perhaps recurrent event and to be able to bring it into the collective awareness, knowledge, and ownership of the group.

Integral to the learning and mastery of the environment is its integration and synthesization into the social and subsistence mapping of an area through the assigning of place names, a process that serves to personalize the landscape, conferring upon it a sense of ownership and perhaps even kinship. Men in their 40s and 50s and older recall how as youngsters their family traveled through the landscape by dogsled and pack dog, and their

parents would stop to point out locations, pass along place names, and tell of their origins, their significance, and of people and events associated with these places.

One of the more interesting aspects of place names and place naming is the multivarious kinds of information they convey about the physical environment. Among the Nunamiut, place names generally fall under several broad categories. One of the most fundamental of these categories memorializes a person or an event associated with a particular locality. A second category tends to describe a particular physical or geographical feature., there are those that convey directional or traveling information, and perhaps the most vital of all, an area's resource potential.

An example of the first instance is Qavvium Kuuṇa or Ben Creek, which memorializes Ben Qavvik Ahgook because it was one of his favorite camping areas. Also, Nigaalum Kuuṇa memorializes Ben's brother Jonas Nigaaluk Ahgook, who died at the creek bearing his name. Examples of physical or geographic settings include Maḡḡaqtuuq Lake, which takes its name from its perpetually turbid or muddy waters, or the Sukkak Mountains, located just a few miles northwest of the mouth of the Anaktuvuk valley. The Sukkak take their name because these two closely spaced rocky outcrops with a creek flowing in the gap between them remind people of a pair of *sukkat*, or upright guide posts placed near the entrance to a deadfall trap.

Directional or travel-related names are not quite as common, but include Qalutaḡiaq or "the route to Qalutaq," an easily traveled east-west trending valley that connects the Chandler valley with the site of Qalutaq on the upper John River. Just south of that is a stretch of the upper John River named Kiiṇaḡvak, which roughly translates as "really gets your face" because it is an area prone to strong north winds, which in cold weather can badly obscure visibility and easily lead to frostbite. In particularly extreme weather the area become impassible.

Perhaps the most interesting group of placenames, however, are those that are most closely linked to environmental conditions and thus in one way or another provide information about an area's resource base. Resource-related place names include Kimmiṇaqtuuq, where cranberries grow in abundance; Siksrikpaich, where a colony of marmots flourishes; or Paiḡluich, a section of the upper Anaktuvuk River where dolly varden can be found year round in open water. These are but a few examples; there are many many more.

Integral to the naming process is the fact that as time goes by, things change, a point explicitly noted by Burch when he wrote, "Eskimo place-names are not engraved in stone; indeed they are known to change to some extent over time. Names are given to previously unnamed features, old names fall into disuse and are forgotten, and new names replace earlier ones" (1981:65).

Examples of changes include the relatively recent transformation of Aglaqviuraq Creek to Kawasaki Creek, resulting from the presence of the discarded hood of a Kawasaki brand snowmachine there that has become something of a local landmark. Name changes

can also reflect changes in the environment or subsistence base, one example of which might be Paluqtat, a small lake along the upper John River, where a beaver (*paluqtaq*) once took up residence.

This reportage is itself part and parcel of the ethic of *aviktuaqatigiiniq*, of sharing. Sharing is one the strongest and most socially rewarded values characteristic of Iñupiat culture. It encompasses not merely the openhanded sharing of food, tools, hospitality, and resources but, equally important, the sharing of knowledge and information. In many ways it is both the natural expression of and the essential response to an environment that while clearly mastered by these people is constantly testing them and thereby drawing them together to collectively meet its challenges. These challenges are best met by cooperation, sharing, and an overriding sense of what is in the best interests of the group. Thus, with rare exceptions, there were few secrets among people in regards to their knowledge of the landscape and its resources.

That said, any attempt to capture or portray the full nature and extent of these people's encyclopedic knowledge about fish would be far beyond either the scope or goals of this report, let alone the ability of the researcher. If it could be accomplished at all, it could only be done by someone of the culture who grew up steeped in the knowledge and traditions of the Nunamiut. In this, as in all other realms of their knowledge, I am but an interested and incidental tourist.

Perhaps the best way to illustrate at least something of the nature and degree of their environmental knowledge about fish is to give concrete examples of specific kinds of knowledge tied to specific seasons, localities, and species. While hardly exhaustive, it is still indicative of the depth and sophistication of people's knowledge and understanding of the environment that they regularly and successfully applied to the multifaceted challenges facing them.

In pursuit of their presettlement and traditional seasonal round pattern of movements, that might, in the course of a year or perhaps several years take them from the fringe of the boreal forest to the arctic coast, the Nunamiut became familiar with virtually every species of fish known to occur in arctic Alaska, from the upper Yukon River to the Beaufort Sea. Naturally, their knowledge of any particular species varied in degree, depending on how common or broadly distributed they were, how highly valued they were for food, or how limited or plentiful they were in numbers.

Clearly, if one were hungry enough, virtually any fish, no matter how skinny, bony, tasteless, or even unpalatable, becomes a prime candidate for consumption as hinted at by Campbell (1970:167) in his recording of "Lots to eat," "Something good to eat," "Pretty good to eat," and ultimately, "Spoil your belly."

At a minimum, for any species of edible fish people know where to reliably look for them, if not always reliably find them, and how to reliably harvest them. For some key species they knew a great deal more than that.

As fall freeze-up progresses and winter begins to set in, the flow of a number of headwaters rivers and their tributary creeks begins to decrease, and in some stretches, dry up altogether. As a result several species of fish, notably grayling, old man fish, and a few others retreat from these areas and proceed downstream, often for many miles, to areas where substantial waterflow and deep pools provide a safe haven to overwinter. As an example, the grayling that in summer flourish along the rocky waters and pools of Contact Creek, the northernmost tributary head of the John River, invariably flee with falling water levels to the vicinity of Hunt Fork, some 40 miles south of the summit, to overwinter in relative safety among the deep pools in this part of the river.

Fortuitously for man, if not necessarily for the fish, these refuge areas often coincide with the presence of warm springs or a sufficiently strong current to keep the water open or at least to substantially retard ice formation, so that the fish could be reached with a minimum of effort. Needless to say, all such locations throughout the valleys of the central Brooks Range and their northern foothills are known by all elders, as are the species of fish that frequent them and the most practical method to take them.

The knowledge of these areas of open water was especially crucial in late winter and early spring, when stores of caribou and other meat were often at low ebb and when fish resources in many of the large lakes were sealed off from easy access by ice 6 to 8 feet thick. In times of limited food, one can readily appreciate the relative ease of fishing through open water as opposed to the expenditure of time and, more importantly, caloric energy consumed by the hard labor of chipping holes through several feet of solid ice in hopes of catching fish.

Even so, the Nunamiut never regarded eight-foot thick ice as a sufficient impediment to deter them from feeding their family, even in the days before metal-tipped blades. To paraphrase the late Jesse Ahgook, a man in his seventies at the time, who as he set out on foot after some quite distant caribou observed to a visitor, “caribou are never too far away” (Ingstad 1954:172) it could just as easily and truthfully be said that the ice is never too thick.

Also part of the knowledge base are the locations where, as described earlier, plentiful numbers of fish often become stranded by falling water levels in small lakes, headwater creeks, and sloughs, and are left dry and frozen, often protected by a thin mantle of ice. Among such locations are a series of small creeks making up the very headwaters of the Kuparuk River, in the heights immediately north of the Atigun canyon, and a river slough along the lower portion of the Killik River, in the northern foothills.

Other very basic knowledge included how to recognize shallow creek and river ice that has frozen clear to the streambed in contrast to ice that still allows a substantial flow of water, and fish, beneath it.

People were also highly skilled at watching seemingly unrelated environmental cues to time some of their fishing activities. For example, in January when the first rays of the rising and returning sun begin to once again light the tips of the mountain peaks for the

first time since late November, people say that the *saviguunnaq* or round whitefish (*Prosopium cylindraceum*) “see the sunlit mountain peaks and begin to leave the lakes” (Gubser 1965:194). This is a good time to set their nets at the mouth of the outlet stream draining Tulugaq Lake, some 12 miles north of the village. Or when the Nunamiut were encamped along the lower Colville River in mid summer they knew that when the *aanaaktiq*, the broad whitefish (*Coregonus nasus*) began running it was time to head down to the foot of the delta to the trade site of Nigliq to await the arrival of the traders from Barrow. Roughly coincident with the run of the *aanaaktiq*, and used as a similar cue for the move to Nigliq, was a small bird known as the *putukiutuk*, the Lapland longspur (*Calcarius lapponicus*).

In those days they did not have calendars, so they used the weather and the animals. They always keep an eye on the birds. When they start to try to fly, that’s when they all think about all gathering at Nigliq. The birds that try to catch flies up in the air, they always crash land because they have not grown the full tail to balance them. As soon as they take off they go a little ways and they crash and roll over. That is the sign they need to all gather at Nigliq and wait for the people from the coast. (Arctic John Etalook, pers. comm. 1981)

When ice fishing for ling cod in fall, knowledge of their predilection for feeding in shoal waters in the evening prompted people to set baited lush hooks close to shore in water 3 feet or less deep and to leave them overnight for collecting in the morning. They also know how the quality (fatness) of the very same fish species can vary from place to place. “Where is lotta ling cod, maybe down by Cache Lake (Kanjuumavium Narvaṇa), mouth of the Kanjuumavik to the lake, best place to set up there too, is got ling-cod too, but the real slim one, they say” (Justus Mekiana, pers. Comm. 2002).

Habitat is the most likely factor here, one not nearly as nourishing to these fish as other localities such as Tulugaq Lake or the Pittaich lakes several miles north and directly off the Anaktuvuk River, where the ling are said to grow fat. An understanding of the link between habitat and fish is critical: why waste time fishing in the middle of a lake for pike when you know they are especially fond of lake shallows where they can lurk among the weeds and water-grasses.

This type of knowledge, when combined with an understanding of the pike’s aggressive nature of exploiting every opportunity in its search for food and its penchant for concealment and cover, is further illustrated by this account by another elder who recalled camping with his parents many years ago near the edge of a large lake.

The area around the lake ... is all flat tundra. Every spring, at break up ... all the flat tundra around the lake is very grassy and when the water level rises, the low-lying areas with dips and hollows become flooded. That’s when all the pike go all over those grassy pools. When people are short on food, they would go fishing for them. They are ideal for dog food. (Arctic John Etalook, pers. comm. 1981)

Observation and understanding of the feeding habits of various species of fish is also vital to maximize the fish harvest. It is common and basic knowledge that fish are most active in their feeding in the early morning and evening hours. It is also known that small creeks and inlet streams flowing into lakes bring with them bugs, larvae, and other edible items that routinely bring certain species of fish, particularly grayling and lake trout, to these locations to feed. In fact it is not at all unusual for the waters of these tributary creeks to hollow out shallow bowls in the lakeshore sediments at the entry point where they join the lake, and several grayling and trout will enter the bowl to feed.

People also know that come spring, the fish, especially lake trout, are as they say “hungry” and as the margins of the lake ice begin to melt, the fish will feed from under the edge of the ice sheet close to the mouths of the inlet streams (Binford 1978:255). Thus such locations have long been popular fishing locations, where shore-based fisherman using long poles called *qulaaniun* would jig for their supper.

Hand in hand with this knowledge of where and when to find fish is the insight that it can be counterproductive to overfish any particular locality, not in the general sense of catching too many fish, but in the sense that prolonged fishing will cause the fish to become bait shy. As Arctic John Etalook noted (1981):

Yes, we fished there all winter, but we always left them alone for a while to make them forget about the hook. When you constantly bother them, they won’t bite, so it is always best to leave them alone for a while and then come back again.

Another example that illustrates a slightly more sophisticated application of information is demonstrated at Ulu or Itkillik Lake, some 50 air miles east of the Anaktuvuk Valley. This lake is just one of several large bodies of water located near or along the front edge of the mountains that were formed thousands of years ago by glacial action. Many years ago the Nunamiut families who regularly fished this lake noticed that the stomachs of many of the lake trout they caught contained snail shells and that they had enlarged anuses from passing the shells. They also noted that these snails were quite plentiful and easily seen in the shallows of a certain section of the western shore of the lake. Putting these clues together that section of lake became a popular ice fishing locality in spring, where fat lake trout could often be taken.

People are also aware that grayling, like most fish, tend to be skittish, especially along shallow, narrow, and gravelly creek beds where shelter in the form of overhanging willows, roots, or soil embankments are scarce. In these types of setting even the passing shadow of a person briefly cast upon the surface waters can set the fish scurrying in all directions. Thus when a man intent upon setting up a fish trap and associated weir has set up his apparatus, the prudent fisherman will exit the creek and walk far to one side of it to prevent the fish from catching any glimpse of him, his shadow or movement, as he makes his way upstream to begin driving the fish towards his trap.

These are only a few examples of the types of traditional ecological knowledge that the Nunamiut draw upon in their pursuit of subsistence resources. Their knowledge of fish and fishing runs far, far deeper than this, but it would take half a lifetime to learn and record it all. One can only hope that others will pick up the trail in the future and actively pursue this avenue of research to eventually do full justice to what these ingenious people know, how they know it, and how they use it.

IV. ENVIRONMENT

Fish have long been a vital source of physical, cultural, and spiritual sustenance to the Native peoples of Alaska. From the Stikine River of southeast Alaska, around the arc of the Gulf of Alaska, through the Aleutians to Bristol Bay and beyond, to the Kuskokwim, Yukon, Kobuk, and Noatak Rivers of the Kotzebue Sound area, great summer runs of chinook, sockeye, chum, coho, and pink salmon have, since time out of mind, been the ever-renewable bounty to coastal and interior peoples alike.

Some cultures, like those of the Northwest Coast Indians of northwestern Canada and southeast Alaska, have virtually been built upon these powerful and magnificent runs of salmon that yearly inundate their rivers and streams with abundantly teeming life. Many other peoples, including Eskimo, Aleut, and Athapaskan, rely upon salmon and other fish as key components of their diet to augment their otherwise primary reliance upon the hunting of large sea or land mammals. Without a plentiful and reliable fishery resource to draw upon, life for them would have been very different and perhaps very difficult.

Interestingly, the farther north one moves, beyond the Noatak and into the arctic waters stretching from Point Hope to Canada, the seemingly inexhaustible runs of Pacific salmon dwindle and diminish into insignificance. In their place, herring, arctic char, and several species of white fish become the dominant and staple varieties inhabiting the rivers that flow down from the Brooks Range, through the arctic foothills, and into the chill, dark waters of the Chukchi and Beaufort seas.

Collectively these richly varied species of fish have, nearly without exception, provided Native peoples with a very important part of their subsistence resource base. Yet there are also those very few, like the Nunamiut Iñupiat, the Inland Eskimo of the north central Brooks Range, for whom fish generally represented a relatively small, though at times significant, part of their total diet and subsistence harvest. Estimates as to the percentage of fish in their traditional diet range from a perhaps 10% or less under normal circumstances when caribou and other resources were readily available (Gubser 1965:252)—although Campbell (1968:9) estimates it as less than 15%—to as much as 20% in times when caribou and the other resources were in short supply (Gubser 1965:252).

To this day, the Nunamiut remain perhaps the premier caribou hunting society in arctic Alaska, and like most big-game hunting peoples, they were semi-nomadic until quite recently. With an economy, and indeed a culture, based upon the hunting of these highly mobile and sometimes elusively migrant animals, it could hardly have been any other way. The ability to move swiftly and sometimes far in search of game and other resources was key to their way of life. But by virtue of their largely montane and foothill territorial

core, they had relatively limited access to large and reliable runs of anadromous fish. Accordingly, they naturally fell back upon those fish most readily available to them, what Campbell termed “locally resident species” (1962:90), those fish which either seasonally or on a year-round basis occupy the upper reaches of the areas rivers, creeks and, especially, its many lakes.

As I mentioned in the introduction, Campbell’s observation that “little systematic ichthyology has been done at Anaktuvuk Pass” still rings true, yet it is Campbell himself who, apart from the encyclopedic knowledge of fish retained in the collective minds of Nunamiut elders, has likely presented the most useful characterization of fish and fishing in the area to date.

Approaching the topic with the particular perspective of an archaeologist (with a barely concealed naturalist bent) he was interested, at least in part, in unraveling the nature of the relationships and influences of Brooks Range ecology upon local human culture, both prehistorically and in recent times as well. (1962:12). As a result, Campbell has yielded a useful and insightful accounting of the nature of the area’s physical environment and its impacts upon fish habitat and their occurrence, providing a very solid base for us to build upon.

The Upper Anaktuvuk and John River Drainages

Because the upper Anaktuvuk and John River valleys were both hewn by repeated glacial advances and retreats over the past several hundred thousand years, each has the classic, U-shaped cross sectional profile. Yet despite this common genesis, their morphology and therefore their hydrology differ radically from one another, perhaps because of their underlying geology. The Anaktuvuk valley is broad and relatively flat: it was cut by ice and water through relatively soft sedimentary limestone. The upper John River, on the other hand, cuts through formations of Kanayut conglomerate, and for much of its length Hunt Fork shale and even some harder gold-bearing igneous sections, so the valley is much narrower (Porter 1966).

The Anaktuvuk River, one of the larger tributaries of the Colville, heads some 18 to 20 miles east-northeast of the summit of the Anaktuvuk Pass, among a number of greater and lesser streams draining the uppermost Anaqtiqtuaq valley in the vicinity of Ernie Pass. From here the river flows westward over a gravelly and heavily braided multichanneled streambed with a gradient of some 60 feet per mile (Porter 1966:12). Along this portion of the valley there are but a few small lakes and ponds, but the river is winding and gravelly, as are the numerous tributary creeks both large and small that host hordes of grayling in summer and the very uppermost area of the river, which is frequented by overwintering char.

Then, virtually at the foot of Napaaqtualuich, a distinctive limestone mountain standing sentinel at the northern corner of the entrance of the Anaqtiqtuaq valley, the river turns sharply northward into the main Anaktuvuk Valley. There the river gradient changes to a much more modest 8 feet per mile and is consequently transformed within the short distance of little more than 3 miles into a single meandering channel that begins to lazily loop its way back and forth across the middle of the valley floor, populated with any number of deep pools and backwaters as well as small shallow sloughs, oxbows, and tributary channels, all of which are prime summer habitat for fish, as the river makes its way beyond the valley mouth and into the foothills.

About 15 miles out beyond the range-front it passes through an old glacial moraine and, shifting to a somewhat steeper gradient, becomes braided once again (Porter 1966:12) and remains so for most of its remaining 90-mile course to its union with the Colville in the shadow of Uluksrak Bluffs.

Of particular interest here is the fish-rich stretch of the river between the summit and the area just beyond the rangefront to the moraine terminus, whose topography, like the upper Anaqtiqtuaq, is dramatically laid bare to view by the absence of trees, typical of barren ground tundra. By virtue of its glacial heritage, this portion of the valley hosts the inevitable suite of ice-contact topographic features such as lateral and end moraines, kames, kame terraces, eskers, closed basin kettle lakes and ponds, and several larger glacially dammed lakes that are linked to rivers and streams.

Among them are a number of sizeable, fish-bearing bodies of water of at least a half mile in length, which people used on a seasonal basis. Beginning from the summit of the pass there is Summit or Eleanor Lake, linked by a small, shallow, nearly three-mile-long stream that snakes its way towards Cache Lake and its unnamed twin, which then drain into the main Anaktuvuk river another two miles or so. To the east, close to the mountainsides, lies the pair of Napaktualuit Lakes, then Anivik Lake. Beyond this on the west side of the valley lies Makaktuk Lake with its muddy turbid waters that give it its name, and then nearly directly across the valley to the east, just inside the end of the mountain line, is the better-known Tulugaq Lake.

As one moves further downriver beyond Tulugaq to roughly the confluence of the Itikmalakpuk River, there is a several-mile stretch dotted with a great many kettle lakes. Known locally as the Pittaich or Pittaluich, literally “the little holes,” these small lakes and ponds and intervening lowlands are often linked to one another as well to the main river by numerous small tributary channels.

Beyond the confines of the Anaktuvuk Valley both east and west are a number of large rangefront lakes, which the people of Anaktuvuk Pass have used for a long time. Just few miles to the northwest, perched atop a foothills highlands, lies Natvakruak Lake, and some 30 miles further west lies the complex of lakes occupying much of the Chandler valley, including Round Lake, Little Chandler, Big Chandler, Amilyogak, and Agiaq lakes.

Moving north and east from the banks of the Anaktuvuk a few miles further downstream, nested in a setting similar to that of Natvakruak, there is the smaller Irgnyivik Lake. Several miles farther east is Shainin Lake, a good-sized body of water nested just inside the mountain line. Beyond that lies a series of other large range-front lakes, occupying the mouths of their respective valleys, including Itkillik Lake, and farther to the east Galbraith and Elusive lakes respectively. All of these have at one time or another been used as fishery resources.

Turning back now to the main Anaktuvuk valley and the areas south of the summit, the John River—itsself a major tributary to the Koyukuk system—is formed along its uppermost portion by the union of Contact and Giant creeks. Contact Creek heads in the mountains immediately west of the summit, then at the eastern edge of the village site makes a sharp turn southward, where a mile later it is joined from the east by its first major tributary, Giant Creek. This forms the true head of the John River. For its first mile or less, the river flows through a broad and gravelly flat that hosts a myriad of channels, which every winter sees the build-up of a large aufeis or river glacier, fed throughout the season by residual flow from Giant Creek augmented by upwelling spring waters. At the south end of the glacier, the river gradient changes to 19 feet per mile (Porter 1966:13) and as a result is a single meandering channel that weaves its way for about 10 miles before the river is joined from the west by its next major tributary, Kollutarak Creek.

The upper John River valley, the area from the summit to the area of Hunt Fork, a distance of roughly 40 miles, is open and relatively broad. From either side of the base of the mountains gentle slopes run down towards the river before abruptly terminating in tall, steep-faced terraces that serve to confine its course to a narrowly hemmed in floodplain less than 1/2 mile across from side to side. This stretch has the better part of a dozen small and shallow ponds between which the river makes its way, a few of which play host to small numbers of summer grayling.



Figure 4.

The upper John River, its narrow flood plain hemmed in by steep-sided terraces.

Photo courtesy and copyright Grant Spearman.

The only deviation from this uniform topography comes about 10 miles below the summit of Anaktuvuk Pass, where the river is joined by Kollutarak Creek. Here, from just a mile or two above Kayyaak, the Kollutarak confluence, the valley broadens out towards the west into a great bowl-like configuration before narrowing once again near the union of Till Creek. It is in this little open rotunda that a pair of additional tributary valleys and creeks, Masu and Ekokpuk, join the Kollutarak slightly above its union with the John. There are also a number of kettle lakes in the area between Masu and Ekokpuk creeks, some of which contain grayling.



Figure 5.

Kayyaak, the broad rotunda-like confluence area with Kollutarak Creek.

Photo courtesy and copyright Grant Spearman.

From here, the river alternates, for much of its length, between a meandering single channel course and a multichanneled gravelly flats until eventually settling down amid an increasingly narrow and steep-walled valley again into a single channel that slowly loops its way, like an unspooled ribbon, down the valley until it eventually emerges from the mountains and flowing for another 17 miles across nearly flat featureless lowlands to its confluence with the middle fork of the Koyukuk just a mile or so downstream from the community of Bettles.

For much of its length through the mountains, the John River valley has few lakes worthy of the name. Nearly the only fish-accessible lakes of any appreciable size that can be credited to its upper watershed are Loon Lake along the Ekokpuk Creek tributary drainage; Agiak Lake at the very head of the Hunt Fork tributary; Pamichtuq Lake, perched high in a cross valley at the head of Mashoshalluk Creek, just downstream from Publituk Creek; and the small unnamed lake at the mouth of Hunt Fork. Thus the fish habitat of the John River is almost exclusively defined by and confined to the river, including its sloughs and streambed pools, along with its numerous tributary creeks and streams.

Within the context of this overall setting, which in its particular detail is unique to this valley complex but is in general terms broadly applicable to the wider, surrounding areas, one can look at two basic populations of fish, the anadromous species that are seasonal occupants and the locally resident species that are present throughout the year.

It is Campbell's assertion that "no truly anadromous fish is presently...readily or commonly available in the pass area" (1962:90)(my emphasis); however, it is one open to quibble. While it is true that there are, for example, small populations of dolly varden and arctic char in the area that are nonmigratory, there are other populations in the area that are truly anadromous. The round whitefish is another species that seasonally leaves the area's lakes for the rivers and heads downstream, so they should be considered at least migratory, if not strictly speaking anadromous. Also part of the picture are the least ciscoe (*Coregonus sardinella*), sometimes also referred to as the least herring, which seasonally frequents high inland rivers and lakes as well as main rivers such as the Colville.

The picture surrounding the availability of anadromous fish shifts dramatically, however, as one moves downstream out of the mountains and into the rivers flowing through the foothills and across the arctic coastal plain. There, the habitat and general river conditions favor the widespread availability of numerous species of white fish, the larger of which include the sheefish (*Stenous leucichthys*), the broad whitefish (*Coregonus nasus*), the humpback whitefish (*Coregonus pidschian*), and the lake whitefish (*Coregonus culpeaformis*) as well as some smaller species including the least ciscoe (*Coregonus sardinella*), the Bering ciscoe (*Coregonus laurettae*), and the round whitefish (*Prosopium cylindraceum*), all of which, in times past, represented a periodically important source of sustenance for the Nunamiut, whether seasonally when traders spent time on the lower Colville River in late June and July or historically in the decades when famine conditions inland drove the Nunamiut to the coast.

From the standpoint of locally resident economic fish in the valleys of the Brooks Range, the top of Campbell's roll call would be grayling, lake trout, some populations of arctic char, some dolly varden, ling cod, and old man fish. Secondly one would be obligated to list the pike, least herring, Siberian red sucker, and the lowly sculpin (Campbell 1962:95).

Campbell elaborates on the importance of these species by stating his opinion that "on the basis of ethnological and archaeological data for Anaktuvuk Pass and Chandler Lake, I think it most probable that the technological utilization of fish by human groups inhabiting the valleys and passes of the backbone of the range must usually be dependant upon locally resident species" (Campbell 1962:90).

Based upon his own observations as well as conversations with Nunamiut hunters and fishers, Campbell put forth a multifaceted set of preferential rankings of what he perceived as the nine most common locally resident species, including lake trout, grayling, ling cod, arctic char, round whitefish, pike, least herring, Siberian red sucker, and the sculpin.

His criteria were relative availability, relative numerical occurrence, relative size, and cultural desirability (Campbell 1962:119–120). Although the relative rankings of each individual species may vary somewhat, the end product of his inquiry is what he

perceived to be a clear delineation of the “relative cultural importance” (Campbell 1962:119) of these species, at least for the period of 1956 to 1962 when this research was conducted. His conclusions were that the lake trout was of greatest importance, followed by grayling, ling cod, arctic char, round whitefish, least herring, and least important, the Siberian red sucker (Campbell 1962:120).

Thus given this relatively limited distribution of fish, both numbers and in locations where they could be harvested, it should come as no surprise that they constituted such a modest part of the Nunamiut diet. Despite these inherent limitations, under normal circumstances fish were eagerly sought to bring sometimes keenly desired variety to an overwhelmingly meat diet, while in times of famine, such as occurred in the early years of the 20th century, they could mean the difference between death and survival.

The nature of this dichotomous relationship is wonderfully illustrated by the following observation by the late Simon Paneak, when assessing the subsistence resource potential of the Killik River Valley, which has long been generally acknowledged among many Nunamiut as perhaps the most resource-rich valley of the north central Brooks Range. According to Paneak, the Killik was the best place of all to live because “lots of willows, that’s why. Lots of sheep, foxes, lots of ptarmigan and ground squirrel.” He added that the upper Killik was also well stocked with fish so that people could catch “all we want”(Simon Paneak, pers. comm. to E. S. Burch Jr., 1970).

It is worth noting here that he makes no mention of caribou but focuses upon many of the important secondary and sometimes tertiary resources that people would be forced to fall back upon when caribou were scarce. This provides a very interesting and valuable insight into how people viewed and assessed the landscape and its resource potential—how well does it allow you to survive without caribou—and not the least of these alternate resources was fish.

While fish might have made up a relatively modest part of people’s overall food intake, they represented a significant portion of their dogs’ diet. This was especially true in summer, and from time to time in the other months when game animals are scarce. Campbell illustrates this point nicely when he tells about the arrival of four Eskimo hunters and their 24 pack dogs at his base camp along the shores of Chandler Lake at the end of May 1956. In his words,

They stayed three days, a portion of the first of which was spent fishing, while the remaining time was devoted to mending gear and resting. The four men took approximately 300 pounds of lake trout and arctic char on handlines in a few hours fishing off the lake ice. Few if any, however, were eaten by the Eskimos, but instead the fish were fed to the several teams of dogs. Meanwhile, the men ate caribou which had been secured along the trail (Campbell 1962:113).

Over the centuries, and through the course of their travels across much of northern Alaska from the southern flanks of the Brooks Range to the Arctic coast, the Nunamiut

have become familiar with nearly every species of fish to be found in arctic Alaska and many from sub-arctic Alaska as well. Many of them are common to their mountainous homelands while others are more frequently found along the northern coast and coastal plain.

The list of fish species presented below is certainly indicative, if not necessarily exhaustive, of their familiarity with the fishes of arctic and subarctic waters. Each species is listed first by its common name, followed by its scientific name and then its Inupiaq name.

Table 1. Historic Fishery Resources Harvested by Anaktuvuk Pass Residents

Common	<i>Inupiaq</i>	Scientific (Linnaeus)
Anayuqaksraq Char	<i>Anayuqaksraq</i>	<i>Salvelinus anaktuvenensis/malma/alpinus?</i>
Arctic char	<i>Iqalukpik</i>	<i>Salvelinus alpinus</i>
Arctic cisco	<i>Qaaktaq</i>	<i>Coregonus autumnalis</i>
Arctic grayling	<i>Sulukpaugaq</i>	<i>Thymallus arcticus</i>
Broad whitefish	<i>Aanaakliq</i>	<i>Coregonus nasus</i>
Burbot (Ling cod)	<i>Tittaaliq</i>	<i>Lota lota</i>
Dolly Varden	<i>Iqalukpik/Paiqluk</i>	<i>Salvelinus malma</i>
Humpback whitefish	<i>Pikuktuuq</i>	<i>Coregonus pidschian</i>
Lake trout	<i>Iqaluagpak</i>	<i>Salvelinus namaycush</i>
Least cisco	<i>Iqalusaaq</i>	<i>Coregonus sardinella</i>
Longnose sucker	<i>Milugiaq</i>	<i>Catostomus catostomus</i>
Northern pike	<i>Siulik</i>	<i>Esox lucius</i>
Pink salmon	<i>Amaqtuq</i>	<i>Onchorynchus gorbuscha</i>
Round whitefish	<i>Savigunaq</i>	<i>Prosopium cylindraceum</i>
Slimy sculpin	<i>Kanayuq</i>	<i>Cottus cognatus</i>

(Sources: Pedersen et al. 1985 (TP 109), Morrow 1980, George 2005, Pedersen 2004, Spearman 2004).

These then represent much of the wide array of fish species with which the Nunamiut are, or have been, familiar. What follows now is an enumeration and discussion of those few key species of fish which are most common, or at least of economic significance, to the Nunamiut people today as they occur and are utilized within the context of the north central Brooks Range and northern foothills provinces.

V. DISTRIBUTION OF FISH

Of those species of fish that are generally accepted as being common to the central Brooks Range and their northern foothills, all can reliably be found inhabiting the many lakes and streams on either side of the continental divide, from the northern tundra barrens to the southern interior forests (Campbell 1962:91).

Yet despite their broad distribution and common occurrence, each river valley and drainage system is possessed of its own unique mix of topography, habitats, and species, so that while any particular species of fish may be broadly distributed, it may be unevenly so, both from valley to valley and from body of water to body of water within any particular valley or drainage.

For example, some lakes host no fish at all because they are landlocked, absent of any outlet or inlet stream by which fish can enter or leave. Other lakes that do possess these vital linkages to rivers, streams, and even other nearby lakes may support a variety of fish during the summer months, yet are too shallow for them to over-winter because their waters invariably freeze to the bottom, or quite nearly so. Even relatively large and deep lakes, without the threat of such a cryonic thrombosis, can vary considerably from one to another in the types of fish they contain, both in overall terms perhaps because of the differing habitats each one offers, and seasonally, depending upon the habits, preferences, and movements of specific species.

The seemingly random distribution of fish in the lakes was succinctly characterized by Campbell when he wrote about the species available in a selection of lakes, including Eleanor, Cache, Annivik, Tulugaq, and Maḡḡaqtuuq:

It has been the experience of the Nunamiut Eskimos, as well as my own, that Eleanor and Cache Lakes for instance do not contain lake trout, while Tuluak has every local species, including pike, a fish not reported from other lakes in the pass. On the other hand all the five lakes mentioned have good grayling fishing, and ling may also be taken from all of them.... Lake trout, however, also exist in Anivik Lake, which does not appear to be any less suitable for that species than Cache or Eleanor Lakes (Campbell 1962:94).

It bears mentioning here that current residents differ from his assessment, in that they have never caught any lake trout in Anivik Lake.

When turning to the examination of rivers and streams, the variability of distribution or even basic availability of particular anadromous species is quite closely tied to the fact

that as one approaches and enters the mountains one is essentially in a headwaters setting, with all the inherent limitations. Among the physical variables that can affect both distribution and availability are the presence, absence, and distribution of spawning beds, resting pools, current velocity and obstructions. These factors determine the occurrence and movements of anadromous fish in fresh water (Campbell 1962:85).

In other words, people living this far inland have, in most instances, effectively excluded themselves from accessing the yearly and plentiful runs of key whitefish species from the arctic side and salmon from the south by placing themselves above and beyond the range and spawning grounds of these species. That said, there still remain certain species of migratory fish like the arctic char and the round whitefish that are undaunted by the challenges of the upper reaches of Brooks Range rivers and streams and blithely make their way into these areas and even thrive there.

In summer, all headwater streams and creeks and rivers, fed as they are by numerous small tributaries draining the mountainsides of melting snow, runoff from rain and perennial snowfields, and even in some instances fed by underground springs, carry a sufficient flow to support large populations of grayling and permit a number of other species to enter connected lakes and ponds for the season.

Come fall, however, as water flow decreases and ice begins to form, some streams cease flowing altogether, while the flow of others, even when fed by underground springs, can become quite constricted as the winter ice grows ever thicker and frequently freezes clear to the river bed. As a result, fish that passed the summer in relative comfort must move farther downstream, sometimes many, many miles downstream, to seek out pools of deep and sometimes open water in which to over-winter.

Other factors in the distribution and seasonal availability of specific species of fish are their specific habitat needs and preferences. For example, lake trout are primarily lake dwellers and are rarely to be found in rivers, while grayling generally prefer the swift and shallow waters of arctic streams, yet are common in lake settings too. Arctic char and dolly varden seem equally at home in either setting ranging from large lakes and small to rivers and small rivulet streams. Ling too can be found in both lakes and streams but seem to grow larger and be more plentiful in lakes, and pike, while relatively scarce on the arctic side of the mountains, seem more often to be found in grassy lake shallows rather than quiet river or stream sloughs in which they are also perfectly at home to the south. Here we will provide short biographies of a handful of these Brooks Range species that were, traditionally and today, of economic importance to the Nunamiut.

Arctic Char (*Iqalukpik*)

The arctic char (*Salvelinus alpinus*) is a handsome and, among the Nunamiut, highly prized fish known by the name *iqaluaqpik*. It is related to both the lake trout (*Salvelinus*

namaycush) and the Dolly Varden (*Salvelinus malma* Walbaum). Its coloration is quite variable and among the members of the local community (and from what I can tell, the scientific community as well) there appears to be some confusion, or at least a lack of unanimous opinion, about the difference between the char and the Dolly Varden. It also appears that there may be more than one variety of char, but this requires additional research to confirm. For example, in late summer fisherman at Amitchuaq Lake in the Chandler valley will regularly catch a very pink, rather salmony looking fish from the waters there, which bears little resemblance to the classic char with its more troutlike lines and unusual coloration.

According to the Alaska Department of Fish and Game Wildlife Notebook Series (anonymous 1978), the arctic char is an anadromous and migratory fish, spawning every other fall along rocky or gravelly stretches of inland rivers and lakes. Once the young hatch out the following spring or early summer, they will remain in these freshwater settings for the next three to four years before migrating down to the sea following break up.

Lake Trout (*Iqaluaqpak*)

Lake trout (*Salvelinus namaycush*) known to the Nunamiut as *iqaluaqpak* or literally “the big fish” are basically lake dwellers and are year-round inhabitants of the Brooks Range. On the average they tend to be larger than most of the other species of fish of the area. Rarely, if ever, are they caught in creeks or rivers, yet some lakes, such as Eleanor Lake at the summit of the Anaktuvuk Pass, which is seemingly capable of supporting lake trout, have none at all.

This fish is quite distinctive in its coloration, with back and sides commonly a dark green and highlighted by many yellowish to nearly white spots. The upper portion of the back tends to be a bit darker than the flanks, and the spots here are much smaller than along the sides, while the belly is white tending towards a yellowish or sometimes yellowish-orange color. Other distinguishing characteristics include a sail-like dorsal fin, a deeply forked tail, and wickedly sharp teeth.

They use these teeth to feed upon a variety of foods ranging from both larvae and adult insects to lake snails to other smaller fish and upon occasion small mammals such as voles and shrews that are careless enough to venture or fall into near-shore waters.

Spawning appears to take place in late August and early September in shallow lake waters over clean rocky bottoms where in the days before mating the male fish stake out their territories and spend their time clearing the rocks of algae growth so that the fertilized eggs can safely lodge in crevices and crannies among the rocks (Morrow 1980:56-57).

Grayling (*Sulukpaugaq*)

Grayling (*Thymallus arcticus*) are commonly found in shallow streams in the summer and year-round in lakes. It is a fish known to the Nunamiut as *sulukpaugak*, a name reflective of its large dorsal fin, which they liken to a large bird feather or *suluk*.

Grayling are a very graceful, streamlined, and trout-like fish. Their large iridescent scales give added dimension to its coloration, which ranges from a dark purplish blue or blue gray along the back, grading into a silver gray perhaps lightly tinged with blue or green. Also present are dark spots scattered along the flanks. The head and fins are darker than the rest of the fish.

Grayling are found throughout Alaska and the Brooks Range, their favored habitat being cold clear streams and lakes. Grayling are a toothed fish, and although they have been reported to feed upon “newly hatched fry of other fish and even on shrews” (Andrews 1978), their diet is primarily of insects. Morrow reports they are primarily surface and mid-depth feeders and rarely feed on the bottom.

According to fish biologists, grayling spawn early in spring—April or May—preferring sandy or gravelly streambeds, and after spawning they continue upstream after breakup to occupy their summer grounds. By September the downstream migration begins, and apart from lake-dwelling individuals, most grayling move down to their wintering areas in larger streams with deep pools.

Round White Fish (*Saviġuunnaq*)

The round whitefish (*Prosopium cylindraceum*), known to the Nunamiut as the *saviugnaq*, is one of the smaller species of whitefish. It is an anadromous species, regularly traveling the rivers of arctic Alaska and into some Brooks Range drainages and lakes such as Tulugaq Lake at the entry to the Anaktuvuk valley and Shainin and Elusive lakes farther to the east (Morrow 1980:33).

These distinctive fish are easily recognized by their long and narrow cylindrical bodies, a pronounced pointed snout, and a prominent dorsal fin nearly midway down its back and a similarly large anal fin on the underside. The coloration tends to be bronze to bronze-green on top, giving way to silvery sides and a whitish belly.

Their favorite foods are reported to be immature insects and the eggs of other fish. Spawning is reported to take place in fall, September and into October, with the fish preferring to lay their eggs on gravelly shallows of rivers and inshore areas of lakes

where they find purchase among the spaces and crevices of the rocky and gravelly bottom (Morrow 1980:33).

These are the fish that people say are available at Tulugaq Lake for much of the year but are taken in large numbers in late January as they leave certain lakes for the rivers and are readily caught by net. According to tradition, the fish are said to be able to see the sun lighting up the mountaintops and take this as their cue to leave the lakes behind them (Gubser 1965:194).

Ling Cod (*Tittaaliq*)

Ling cod (*Lotta lotta*) or *tittaalik* are without doubt one of the ugliest and primordial-looking fish in the arctic, and like grayling are adaptable to living in both lakes and slow shallow streams. This generally bottom-dwelling fish has a long, eel-like body with a broad, flattened head and sets of dorsal and anal fins along the top and underside of the body that run from the middle of the body nearly all the way to its small, rounded tail. Also distinctive of this fish is the barbel or “chin whisker,” what the Nunamiut call the *nāgiaq*, located on the underside of the tip of the lower jaw, which, they say, the ling uses as bait to attract smaller fish into its feeding range.

Its coloration is largely a muddy, olive brown, mottled with lighter yellowish blotches. Ling cod taken from Brooks Range waters might average 24 inches and 3.5 pounds (Bendock 1979:61). The Nunamiut say that the ling cod that live in the mountains are generally smaller than those living farther north in the Colville, or Kuukpik, River.

Despite its unsavory physical appearance, the Nunamiut had few reservations about consuming its flesh, and the customary way of preparing ling was by boiling. People are especially fond of a special treat called *tinugaq*, in which the stomach and liver were plucked from the boiled fish then cut up, mixed together, and eaten. Interestingly, they say that unlike many other kinds of fish, ling was not eaten as *quaq* or raw frozen fish, in part because the uncooked flesh is both tough and chewy, and they say it “has a funny smell.”

Old Man Fish (*Aṇmaqquṭ*)

One of the unique species of fish in this area is a variety of dwarf arctic char known to the Nunamiut as *aṇmaqquṭ*, literally the “old man fish,” but often referred to as *aṇmakkut* for short. The old man fish or *aṇayūqaksraq* char (*Salvelinus anaktuvukensis*) (Morrow 1980:63) is what one prominent biologist characterized as “a rare species—a zoological curiosity” (Morrow 1980:64).

Closely related to the Dolly Varden char (*Salvelinus malma* Walbaum), it is a small fish, reaching perhaps 8 inches long and 1 1/2 in girth, and easily recognized by its striking coloration: the back and sides are an overall deep black, highlighted with small bright red spots, some of which might be surrounded by a lighter blue halo.

This fish is found only in selected small headwaters streams on either side of the crest of the Brooks Range, discontinuously distributed from Howard Pass in the easternmost Schwatka/ westernmost Endicott Mountains to the Aichilik River in the Romanzoffs. Though clearly localized to the Brooks Range, they are not, strictly speaking, an arctic species. In the immediate vicinity of Anaktuvuk Pass they can likewise be found on both sides of the divide. Northward they occur along the upper Anaktuvuk, Tulugaq Lake, Shainin Lake, and elsewhere. South of the summit they are taken from John River tributaries such as Contact Creek, Giant Creek, Ekokpuk Creek, Loon Lake outlet, as well as Bombardment Creek on the North Fork of the Koyukuk.

From a scientific standpoint, very little is known of the biology or habits of these fish beyond what the Nunamiut themselves have reported (Morrow 1980:64) of their preference for living in headwaters streams, a springtime spawn, and an overwintering habit of retreating to and congregating in areas where warm springs afford them a constant and plentiful flow of water and food. These localities also tend to correspond, by virtue of the warm spring flow to Sikusuiḷaq, with areas of open water in otherwise iced-over streams. This fortuitous combination of congregated fish and open water made these fish a valuable emergency winter food resource (Morrow 1980:64).

Dolly Varden (*Paiḡḡuk*)

Another member of the char family common to the north central Brooks Range area is the Dolly Varden (*Salvelinus malma* Walbaum), known to the Nunamiut as *paiḡḡuk*. They are an interesting fish because there are both anadromous and nonmigratory freshwater varieties inhabiting both lake and river settings (ADFG). They are also very striking in appearance, possessing the handsome form common to members of the salmon and trout families, combined with a quite distinctive coloration. However, given the degree of uncertainty in the precise speciation differences between arctic char and Dolly Varden, little more can be said.

Humpback Whitefish (*Pikuktuuq*)

Also part of the array of locally, though seasonally, available fish species is locally known as *pikuktuuq*, the humpback whitefish (*Coregonus pidschian*). According to one

source, these fish are only briefly available in the Anaktuvuk area, usually the first week of July, and can be found in both creeks and lakes (Roosevelt Paneak pers. comm. 2004). Sites where they could reliably be found include Tulugaq Lake and Anivik Creek. Speculation is that this brief appearance is somehow related to their spawning activities.

Other species of fish that could have been included in this biography of edible fishes, but were not, included the northern pike (*Esox esox*) and the slimy sculpin (*Cottus* sp.). Both are edible but neither are especially desirable, the pike because of its incredibly bony—though admittedly tasty—meat and the sculpin because ... well, if you have ever seen one, you wouldn't want to eat it either.

VI. TRADITIONAL FISHING METHODS AND TECHNOLOGIES

As a big game hunting and gathering society, the Nunamiut survived, in part, by drawing upon a deep and detailed knowledge of their world amassed and compiled over the course of many generations. Fish and fishing, of course, was an integral part of that knowledge base, and in the normal course of events, the most successful fisherman were those who best combined the lore of their fathers with the skills of their own experience. This knowledge encompassed a thorough understanding of the favored habitat, feeding and breeding habits, and seasonal movements of each species of fish, combined with a detailed knowledge of the physical landscape and the precise locations where each type of fish can be found at any time of year under varying conditions from spring floods to winter freeze up.

To cite but three examples, the astute fisherman will know not only what species of fish are present in any particular lake or section of river at any particular time of the year, but also the best locations along or within that particular body of water for catching each individual species and in what season that locality might provide the highest yield. Their knowledge involves which back eddies along the shore of a certain stretch of river will be the most productive location to set their nets to catch migrating fish. Even in mid-winter when rivers and lakes are covered with dense mantles of ice, people know the locations of *sikusuiḷaq*, areas of open water caused by warm springs or swift currents, where fish are likely to overwinter. All of these things and many more are part and parcel of their environmental and fishing lore.

Of course, the bane of all fishermen the world over is the one that got away. To a sports fisherman this usually represents little more than a passing sense of aggravation and disappointment, or on the brighter side of things, the source of a good story to be repeatedly told and embellished beyond all recognition around the campfire or the neighborhood bar.

For a subsistence fisherman, however, all of life involves risk and a lost fish represents, at least, lost food. In difficult times this can mean hardship and sometimes even death. Thus the need and, more to the point, ability to reliably catch fish under any and all circumstances was nothing short of a necessity. So it was that the Nunamiut developed, refined, and employed a sophisticated suite of methods, techniques, and technologies to take fish.

Fishing, like hunting, can be pursued as both an individual and cooperative group activity. The classic individual pursuit is the image of a lone fisherman jigging away through a hole in the ice but can also include a man or woman setting out a trotline of baited hooks or even setting up a small improvised wooden fish trap in a shallow stream.

Cooperative efforts were usually required for setting nets or driving fish into nets and large traps.

Among the traditional methods by which they secured this resource were the use of highly refined technologies like gill seine and dip nets, wooden traps and weirs—occasionally used in conjunction with organized drives to herd the fish toward the contrivances—fish-spears and fish-arrows, hook and line jigging, trot lines, gaff-hooks, as well as a handful of other, more Paleolithic, measures including the use of rocks and sticks and taking advantage of naturally occurring situations when falling and freezing waters stranded fish in cut off sloughs or left them high and dry in empty headwater stream beds.

In the following section each of these technologies will be described in detail, exploring how they were made and employed, from traditional times to the present day.

Hook and Line Jigging

Hook and line jigging enjoys a long and sustained history among the Nunamiut people. It is an ancient practice once actively pursued on a nearly year-round basis, whether in the open waters of summer or through the translucent carapace of ice seasonally capping the area's many lakes and rivers from October through May. In times past the most intensive jigging activities tended to take place in late winter and early spring, a time when food resources were generally at low ebb, and people eagerly awaited the returning caribou herds. Often families would gather near a large, fish-rich lake to subsist, in the meanwhile, from their daily catch of lake trout, grayling, and arctic char.

In particularly tough years, as we will see further along, people were sometimes forced to pass an entire winter by traveling from fishing hole to fishing hole, jigging for their very lives, barely making it through to spring and sometimes not at all. It was also an activity in which both elders and youngsters could productively participate, freeing more able-bodied adults to search for other, larger game resources. In summer, jigging activities tended to diminish into insignificance, in relation to the use of the much more productive fish traps or seine or gill nets that could take in a much larger harvest of fish for the amount of time and effort invested.

Today the most intensive periods of jigging are in fall and spring, the shoulder seasons at either end of the short, dark, and often bitterly cold days of winter. These are the periods of longer daylight hours and relatively warmer temperatures, the very conditions making ice fishing such a pleasant recreational as well as subsistence pursuit. Once the spring ice becomes unsafe jigging activity ceases, replaced by another and more recent form of hook and line fishing: the use of spinning reels and in rare cases, fly rods. Gone are the days when young boys close to home or far-ranging hunters on foot would break out their willow poles and handcrafted ivory lures to jig for grayling. Out instead come the

inexpensive Zebco rod and reel and a no. 3 Mepps lure to be cast and cast again until there are enough fish to fill the family frying pan.



Figure 6

A successful late summer hunter and fisherman, 1950.

Photo by Laurence Irving, courtesy and copyright the University of Alaska Archives.

Basic Jigging Tackle

Hook and line jigging is known to the Nunamiut by two terms, *aulasaqtuq* and *niksiksuqtuq*. Both are derived from the names of two of the most basic implements, the fishing pole and the fishing lures respectively. The basic jigging outfit includes the *aulasaun* or pole; the *ipiutaq* or the fishing line; the *uqumailutaq*, the sinker weight; the *niksik*, the array of lures of various shapes, sizes and materials used to hook and catch the fish; plus the *itimaun*, a stick used in conjunction with the pole to help “reel in” the fishing line.

Other more specialized but associated gear usually included a *tuuq*, or ice chisel, used to penetrate through lake and river ice; the *ilaun*, a ladle or sieve-like implement used to clear ice and slush from the chiseled hole; the *mitiyiun*, a wooden club sometimes used to subdue a freshly landed fish; and the *qulaaniun*, a very long handled pole used to fish along the margin of retreating spring lake ice and sometimes along streams in the open waters of summer.

Of all the traditional fishing methods and their associated tackle, hook and line jigging gear probably saw the greatest degree of individual expression. Poles and *itimaun* varied in length, style, and degree of finish, and lures themselves, while generally conforming to a pretty standardized form, could show considerable leeway in materials from which they were fashioned, their size, coloration, craftsmanship, and elaboration.

Typically a pole might be fashioned from a 10 to 20 inch long by 1 inch thick willow stalk, stripped of its bark and then given a subtly ridged or fluted finish with the edge of a knife drawn lengthwise like a modern-day spoke shave. A short distance back from the foretip, a groove would be carved around the circumference of the pole to tie on the fishing line and prevent it from slipping off. It was also customary to notch each end of the pole so that when not in use, the fishing line could be wound end to end and the lure secured in place by hooking it into the pole, as illustrated in Figure 7, drawn from Murdoch (1892).

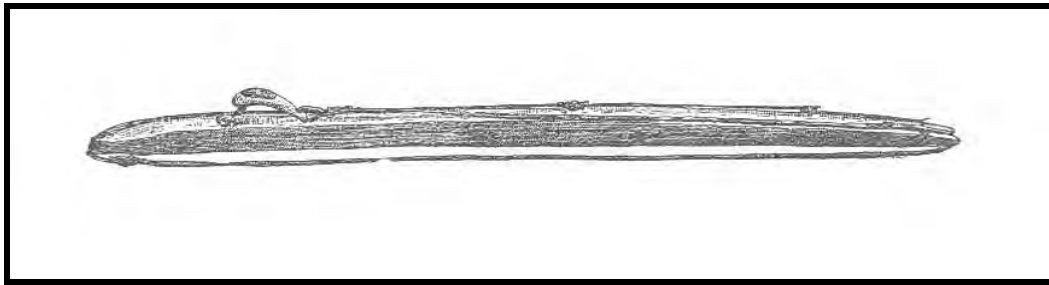


Figure 7
A traditional fishing pole with line wrapped from end to end.
Drawing courtesy and copyright U.S. National Museum.

The fishing line itself was called the *ipiutaq*. Traditionally, fishing line could be made from a variety of materials, depending in part on what was available and to a lesser degree, personal preference. According to a variety of available sources, fishing line was made from materials as diverse as *ivalu* or braided sinew, rawhide *quniguq* line, stripped bird feather quills, known variously as *saunaq* or *manjuq*, and stripped baleen or *suqqaq* traded in from the coast. Baleen, sometimes also referred to as “whalebone” is a form of keratin, the same material as human fingernails, but in this instance it grows in the form of long bony plates in the mouths of baleen whales.

Baleen is a very durable, stiff, yet flexible material, perhaps best thought of as a sort of prehistoric plastic that can, among its many qualities, be cut and shredded into fairly thin strips, then knotted together end to end to make a tough, durable, slick surfaced and waterproof line several feet in length. The chief superior quality of baleen over the other materials is its resistance to rotting and its durability, which became most evident in winter when the line becomes fouled and burdened by the inevitable build up of ice or *qikuaqtugaa*. Unlike sinew or rawhide, baleen is easily cleared of ice build-up by a simple upward flick of the wrist bringing the line into short sharp contact with the edge of the hole. The other materials are simply stripped of ice by hand in an action known as *piaksaaq*, meaning to make it slippery.

Also part of the fishing line is the *uqumailutaq*, the sinker weight. According to one senior elder, these weights were formerly made from horn, bone, antler, or ivory and carved into a streamlined, roughly tear-shaped form (Figure 8). Details are lacking on precisely how they were attached to the line, but clearly small-diameter holes were drilled through at the upper and lower ends of the weight, through which they were tied off to the line just a few inches above the actual lure. Eventually, according to this same individual, these traditional materials came to be replaced by lead bullets pounded flat and then simply wrapped around the line, thereby saving people hours of time carving and forming those earlier organic materials into the requisite size and shape.

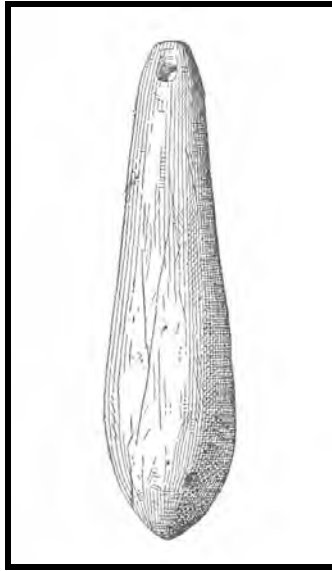


Figure 8

A tear-drop shaped line weight.

Drawing courtesy and copyright U.S. National Museum.

The *itimaun* was a second wooden rod or stick of roughly the same length, or perhaps a bit shorter than the actual fishing pole itself, that was used in conjunction with the pole to “reel in” the fishing line. This was done by making a series of alternating figure 8 motions with the pole and *itimaun* to bring in the fish without a person ever having to touch the wet line (Figure 9).

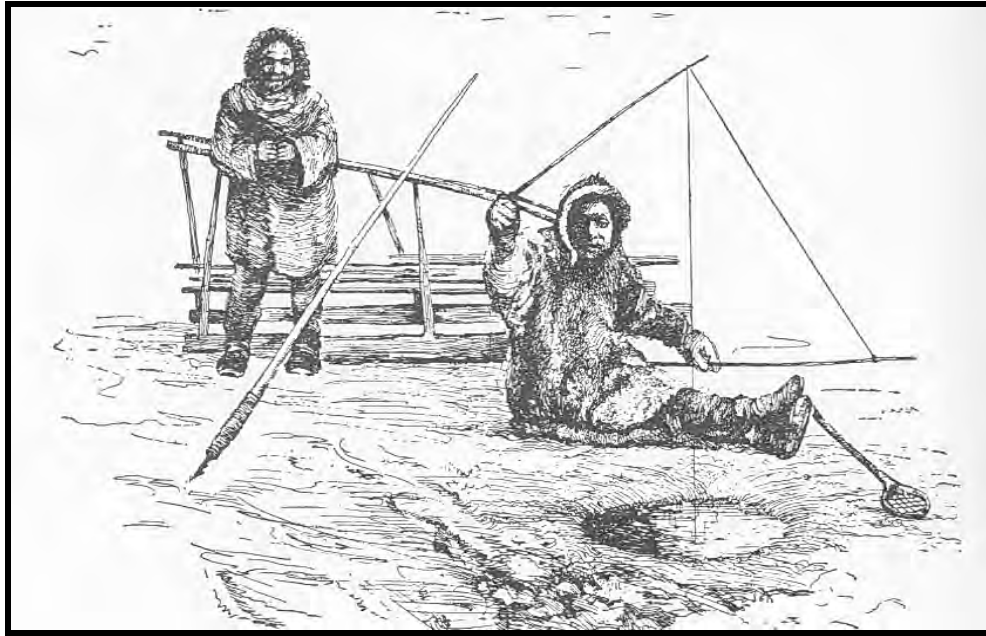


Figure 9

An *itimaun* in use.

Drawing courtesy and copyright U.S. National Museum.

Once the tug of a fish was felt on the line, a right-handed fisherman initially gave his pole a sharp upward jerk to set the hook. Then, taking the *itimaun* in his free hand, he brought it to the right, low across his chest, to the far side of the line. He then used the tip of the *itimaun* to catch the line from the opposite or underside, bringing it back to his left, while at the same time lifting it high so that he could then dip his pole, swung it back to the left across his chest again, then catching the line from the opposite or underside and bring it back to his right. These motions were repeated several times until the fish was lifted clear of the water and deposited upon the ice, at a distance far enough from the hole to prevent it from wriggling free and flopping back into the water. Usually, within a matter of moments the fish would simply freeze, although some people preferred to immediately cudgel the fish into submission with a stout whack or two, or eight or ten, from a wooden club.

Jigging Lures (Niksik)

Jigging lures, known collectively as *niksik*, were made in a variety of sizes and styles and materials, tailored to catching a variety of different kinds of fish. For example, the relatively small hooks, intended to catch fish like the *sulukpaugaq*, or arctic grayling, were called *sulukpaugaqsiun*: literally “an implement used to catch grayling.” Similarly, larger hooks intended to take larger fish like the *iqaluaqpak*, the lake trout, were known as *iqaluaqpaksiun*. Of course such lures were not limited strictly to one particular species of fish, so that grayling lures could be used to catch other similarly or even larger sized

fish, including lake trout, arctic char, and others. These larger lures were usually referred to simply as *niksikpak* or literally “big lures.”

Lures were traditionally made from materials as varied as caribou antler, Dall sheep horn, walrus or fossil mammoth ivory, as well as the teeth and claws of grizzly bears, wolves, and even wolverines. Of all these materials, caribou antler and sheep horn were the most readily available, but there seems to have been a clear preference for ivory traded in from the coast, because of its appearance, durability, and easily worked texture. In its absence, bear and wolf canine teeth could also be fashioned into serviceable lures, cleverly using the natural curve of the teeth to best advantage, but they tended to be a bit more difficult to work and more prone to splitting.

Grizzly bear claws, or *kukik*, were also used to fashion lures, usually ones for smaller fish like grayling or others like them. The claws lent themselves nicely to this use because the craftsman could use the natural curve of the claw to his advantage, with the broader head of the lure cut from the section of the claw closest to the knuckle and the tail of the lure towards the tip of the claw.

One elder recalled being told by his grandfather that grayling in particular were especially fond of brownish to yellow colored lures, so that he always preferred to use the richly hued fossil ivory for his *sulukpaugaqsium*.

Most *niqsik*, despite their individual differences in size or material, conformed to a basic form: a tear-drop-shaped shank with a barbless hook protruding at a roughly 45-degree angle from the underside. Viewed from the top or dorsal face, they are broadly rounded at one end and taper to a slightly rounded point at the other. Viewed from the side, the shank has a gentle arch from end to end, with a rounded, convex top side and a concave ventral underside, so that the lure is thickest at its broadest end but gradually tapers and narrows toward the narrower end (Figure 10).



Figure 10

Niksik hooks collected in Barrow in the 1880s.

Illustration courtesy and copyright the Smithsonian Institution.

In traditional times the actual hook, or *aki*, was often fashioned from a sharpened splinter of caribou marrow bone, then inserted from the dorsal through to the ventral face through an upward angled hole, drilled near the thickest and broadest end of the shank.

Eventually, when metal nails or skin sewing harness needles became available, they quickly came to replace the bone hooks, but now, angled holes were abandoned in favor of drilling straight through from back to front. On the underside the nail or needle was left to project straight out a short distance before being bent sharply upward, but still at an angle from the underside of the shank.

At the opposite end of the shank, a pair of closely spaced, small-diameter holes, one below the other, were drilled through from back to front for threading and tying on the leader.

Because lures were intended to attract the fish's attention and entice them to bite, fishermen often lavished great care upon their detailing and decoration. Almost without exception, the lures were very carefully crafted and finely finished. Often they would be elaborated upon by drilling and coloring small holes or by applying small colored seed beads to suggest the presence of eyes (Figure 11). Other methods of making the lure visually interesting to get the attention of fish were to add shiny copper rivets or to incise lines on the dorsal face of the lure.



Figure 11
An ivory grayling lure with beads as eyes.
Photo courtesy and copyright Grant Spearman.

According to one senior elder, a man rarely traveled anywhere without a handful of fishing lures along with him. Oftentimes he carried them in a hollowed-out section of caribou antler, called an *ulluun*, kept in his caribou skin backpack or tied to his belt.



Figure 12
Lures spilling out of a caribou antler *ulluun*.
Photo courtesy and copyright Simon Paneak Memorial Museum.

Although jigging could be done at any time of year, it appears to have been most popular between late fall and late spring, when partially or wholly frozen lakes and rivers offered a stable platform for fishing. *Sikusuiḷaq* were especially popular locations, areas of open water where fish could be accessed without having to chop through the ice. Such locations frequently occurred where warm springs fed or upwelled into lakes and rivers and where water could actually remain open for much, if not all, of the winter (Figure 13). Of particular importance were localities along larger creeks and rivers where overwintering populations of fish tend to congregate in deep pools. These can often represent a rich and easily accessed emergency food resource.



Figure 13

Sikusuiḷaq: open water at Tulugaq Lake, a good place to jig.

Photo courtesy and copyright by Grant Spearman.

This dependence upon fish is particularly well illustrated by one elder who recalled a very difficult winter spent in the foothills during the starvation years in the early 1900s. It was passed moving from camp to camp, subsisting primarily on fish, fishing at any particular place until they could catch no more, and then moving on.

We would go upriver into the Anaqtuuvak on foot and at the end of the place where it doesn't completely freeze through, we would hook for *anmaqut* and make our living in this way.... After a while we began to experience hunger, and the fish became difficult to hook. They learned that we were in that area. That is the way fish are when people stay close. They became out of reach to us. (Arctic John Etalook, pers. comm. 1982)

Even the thickest ice was not enough to stymie the determined fisherman, especially when fish could mean the difference between famine and survival. It was considered a matter of course for people to laboriously chop through 6 to 8 feet of ice with nothing more than a heavy pole tipped with a chisel-edged blade of ivory or antler to reach their intended prey.

Where such a hole was chopped was hardly a matter of whim or chance. Over many years of trial and error, observation, and experience, the Nunamiut came to know the best fishing localities in virtually any body of water with which they were familiar. Even when traveling in unfamiliar territory men constantly kept their eyes open for, and often tested, what looked to be promising fishing places for future reference.

Once a hole, or *alluaq*, was made through the ice and cleared of any residual slush or ice chips, the fisherman took his pole and dropped his weighted and baited line down to the bottom of the lake or river before raising it back up a foot or so and starting to jig the lure up and down. Fishing was often done in a sitting or kneeling position (Figure 14), perhaps seated on a caribou skin mat or pad for added comfort, but people periodically stood up to jig and stretch for a change of pace. Occasionally, for added comfort on a particularly cold and windy day, people might cut and pile snowblocks to build a small windbreak or *uquuttat* to shelter them from the brunt of the chill.



Figure 14
Boys jigging through the ice.
Photo by Laurence Irving, copyright the University of Alaska.

According to most sources the lures were regularly baited, although in times of shortages a fisherman might initially need to jig with an unbaited hook until his first catch, at which point a section of flesh would be cut from the underside of the fish and applied to the hook as bait.

In late spring, as the ice upon the lakes began to recede back from the shore, the Nunamiut would often break out their *qulaaniun*, long-handled fishing poles up to 8 or 10 feet in length. These were used to fish along the edge of the ice pack where the fish like to shelter and feed, especially in areas near the mouths of swiftly flowing inlet streams.



Figure 15

The open lane of water between the shore and retreating ice pack.

Photo courtesy and copyright Grant Spearman.

People say at this time of year “the fish are hungry,” so fishing tends to be quite brisk and successful. The use of these long-handled poles allowed people the option of fishing the lead from shore or venturing out on the ice while remaining safely back from the

deteriorating ice edge. As the season progressed and the main body of ice continued to rot, it was almost inevitable, as long as the fishing was still good, that someone would push their luck just a little too far and end up going for a very cold swim. *Qulaaniun* poles were sometimes fashioned on the spot from willow growing nearby, but it was also common for men to bring their long handled *kakiak* or fish spears along and to simply attach the lure and line to the other end of the spearshaft.

Summer jigging, as alluded to earlier, was relatively less commonly practiced, but never the less continued to be conducted as inclination or need dictated. Shore based summer jigging, or *qulaanigiuraq* as it was called, was usually done along swiftly flowing creeks where grayling are always to be found. As one man said:

When lotta mosquitoes, a little creek, like Anaqtiqtuaq, just right for the *sulukpaugaq*. ... Really important for the Nunamiut is *sulukpaugaq*, because *sulukpaugaq* is everywhere, *sulukpaugaq* is everywhere. Anywhere like smaller creek, *sulukpaugaq* is always in the summertime traveling up.” He also went on to add that “*sulukpaugaq* is really smart; when it’s cloudy, no sun—when you follow the creek to go down, the *sulukpaugaq* see you come and go all away. When it’s sunshine you could really close-up all the time. When you *qulaaniuraq* in the summertime, in sunshine you could catch ’em closer. When it’s cloudy, it could see you long ways. (Justus Mekiana pers. comm. 2004)

In Mekiana’s experience, grayling fishing was most effective when the mosquitoes are thick and the grayling are feeding on the surface. The fishing was done using a slim, somewhat flexible willow pole, or *qulaaniun*, perhaps 8 or 9 feet long. Attached to this was a line of similar length tipped with a small *sulukpaugaqsiun* or grayling lure as described earlier. The trick was to cast the lure out into the heart of the current where the turbulent waters help keep the lightweight lure at or near the surface of the water as the fisherman pulls the lure along with the pole. Keeping the lure moving atop the flowing waters will induce the surface-feeding grayling to bite. Again, in Mekiana’s words: “When you throw ’em away on top of the *saġvaq*, the *niksik* always floating above. When you pull it this way, floating almost above the water, swimming, swimming, just like man swimming, almost. When you stop, all the way down the river-bottom, when you stop.” This, one must suppose, is a skill rarely practiced anymore, but it is an interesting tidbit of information that at least has been rescued from slipping completely out of mind and beyond memory.

Lush Hook Fishing

This is an ancient method of fishing which the Nunamiut have used from early traditional times until fairly recently, primarily to take the *tittaaliq*, the ling-cod or burbot (*Lota lota*) and, occasionally, the *siulik* or northern pike (*Esox lucius* Linnaeus). Using both large

hooks called *qagruqsaun* and throat gorges known as *sannigugiaq*, baited lures were set out overnight in areas of shallow water where these fish are most active in their feeding.

It was an all-purpose method that could be used in both lakes and rivers, in the open waters of summer, and beneath the shallow ice of late fall and early winter. Even more importantly, it was so very reliable that it allowed men, women, and children to freely pursue other activities, and even sleep, while the fish essentially caught themselves. Although the ling and, to a lesser degree, the pike were usually the fish caught by this method, it was by no means limited just to them.

Here, I give information on the types of places where these lures were most often used, why, and a detailed description of the basic *qagruqsaun* tackle, how and from what materials they were made, how they were baited, and how they were set.

Fishing Localities

Both pike and ling are equally at home in both lakes and rivers. According to one elder, river sets are usually restricted to *qaglu*, the quiet pools or backwaters where river currents are slow. The best lake set locations, particularly for ling, are said to be at *nuiḷaq*, the shallow waters at the head of a lake outlet stream, and *kuugum paḇḇa*, the mouths of inlet streams that flow down from the neighboring mountainsides. It is here that young grayling and lake trout come to feed on insects, insect larvae, and various nutrients washed down from upstream and in the process become easy prey for the wily and ever hungry ling (Figure 16).

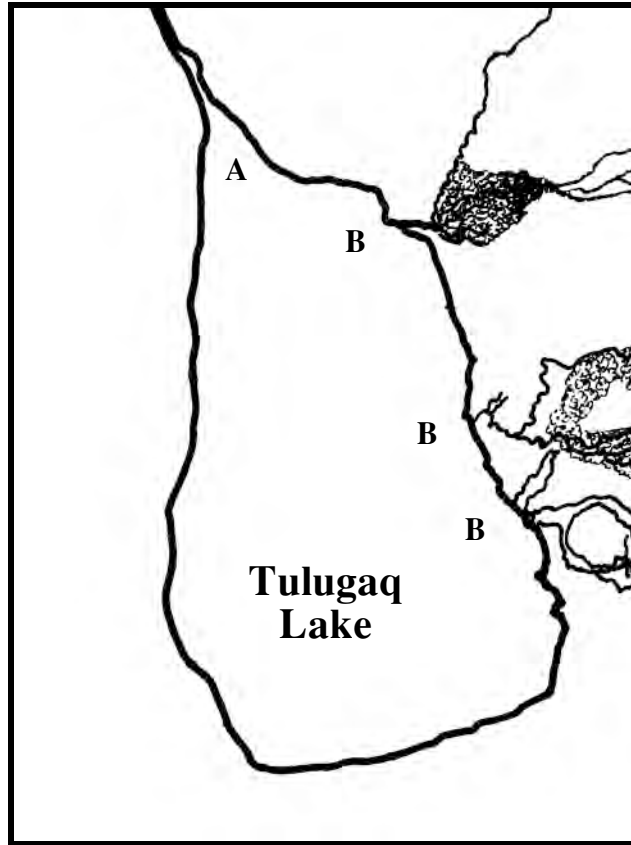


Figure 16: Tulugaq Lake

Illustrating (a) *nuiḷak* and (b) creek outlet or *kuugum paḇḇa*, the types of locations where *qaḡruqsat* were set.

People say that the best time to take the ling by use of *qaḡruqsaun* is in early fall, just around freeze up, because after a full summer of feeding they are at their fattest and best condition of the year. A fat fall *tittaaliq* was considered a real treat to be enjoyed. They could also be taken in summer, but at this time of year they represented more of a back-up food resource if caribou or other game was scarce.

Although ling can be found in many lakes and outlet streams around Anaqtuuvak and elsewhere, some places were known to produce bigger, fatter fish than others. For example, Tulugaq Lake is known for nice fat ling, and the Pittaich lakes area just a bit north from there was also a good place to take them, but another locality not far from the village does not enjoy quite the same reputation. “Where is lotta ling-cod, maybe down by Cache Lake (Kanḡuumavium Narvaḇa), mouth of the Kanḡuumavik to the lake, best place to set up there too, is got ling-cod too, but the real slim one, they say.”

Tackle and Sets

Lines

The most basic *qaġruqsaun* tackle outfit consists of the tether-line, the lure, and the stay. Lines varied in material from rawhide to baleen. Lures were of two basic types: hooked lures and gorges. The stays were simply stout stakes either driven into the ground or frozen onto the surface of a lake, river, or large stream. Sets could vary from a single lure at the end of a short line to a much longer line with a wooden float at the far end and baited with multiple lures. Each will be described in detail below.

The tether line, known variously as the *ipiutaq* or the *pituutaq*, was traditionally made from either of two materials, *quniguq* and *suqqaq*. *Quniguq* is a form of babiche, a rawhide line usually about ¼ inch thick made from dehaired caribou skin, and because it was a locally available material which the Nunamiut made themselves, it was perhaps more widely used than *suqqaq* (Figure 17).



Figure 17

Quniguq, line made from dehaired caribou skin

Photo courtesy and copyright Simon Paneak Memorial Museum

Suqqaq line was thin, flexible and very, very durable. Obtained in trade from coastal Iñupiat, it is made from thin strips of baleen or *suqqaq*, which grow in the mouths of *aġviq*, the bowhead whale (*Balaena mysticetus*). This type of line was said to be

especially good for use in ice fishing because it was so shiny and slick, it was less prone to accumulating ice than *quniguq*, and it was more easily cleared.

Tether lines varied in length. One elder recalled seeing the use of lines as short as 2 feet and as long as 6, with the length of the line varying depending on the depth of the water and the slope of the beach. As might be expected, a shallowly sloping beach might require a longer line than one that drops off quickly into deeper water. The lines could also be quite a bit longer, as will be described later.

Lures

The lures could take either of two basic forms: the *qaġruqsaun* proper (a hooked lure) and the *sannuġiaq*, a bi-pointed gorge (Figure 18).

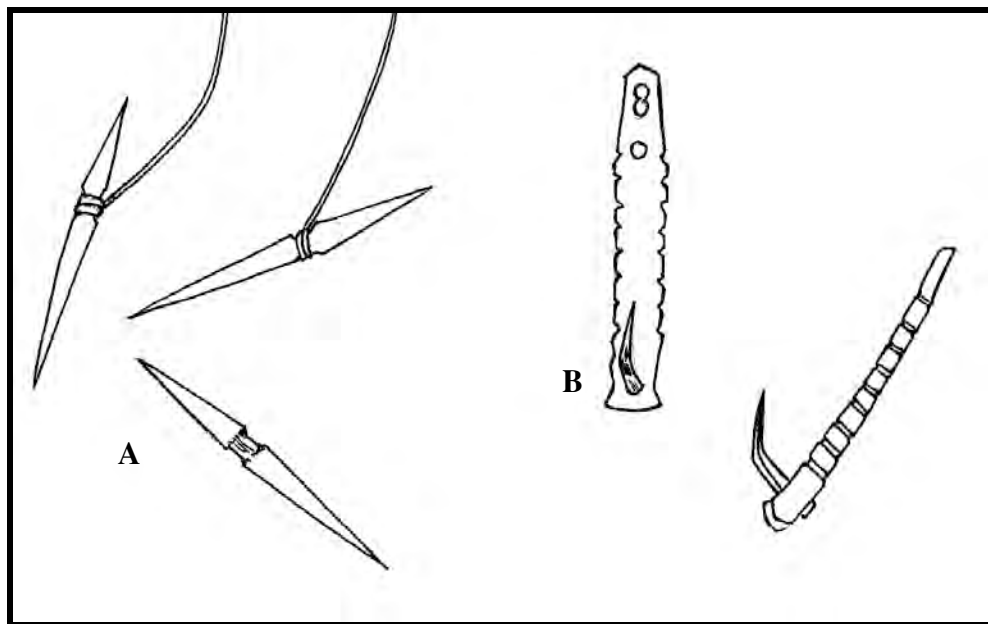


Figure 18
(A) the *sannuġiaq* gorges and (B) the hooked *qaġruqsaun* lure.

Although *qaġruqsaun* lures might vary somewhat in size, material, and form, they were typically made of either antler or perhaps ivory. They had a fairly narrow, slightly arched, flat body with serrated notches cut into each edge. At the upper end, a pair of small holes was drilled through the body, one slightly below the other, to accommodate the fishing line. At the bottom end would be a barbless hook. In earlier days, before the introduction of metal, a sharpened spike of marrow bone would have been inserted through a hole drilled at an angle from the back side, or as indicated in Figure 18, a drawing by Simon Paneak (1900–1975). The hook spike would have been tied or sewn to the shank of the lure. In more recent times, at least since the latter part of the 19th century, the hook was often fashioned from a square metal nail bent to the proper angle and inserted through a drilled hole.

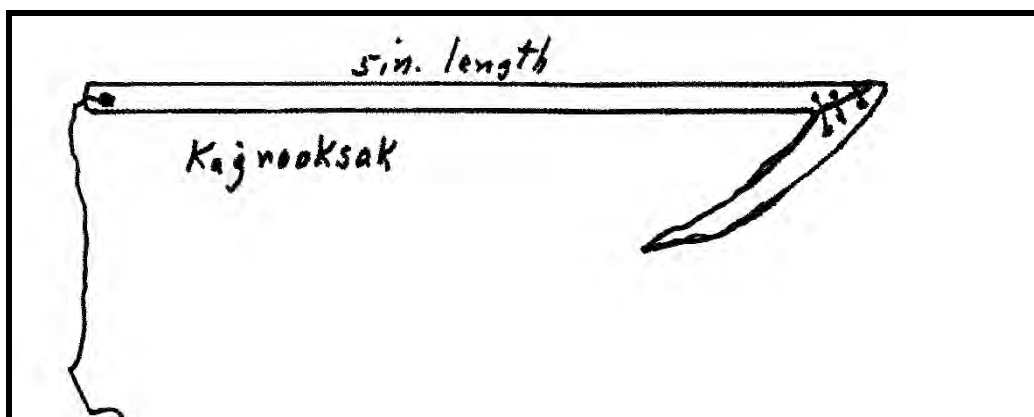


Figure 19

Simon Paneak's drawing of *qagruksaun*.

Drawing courtesy and copyright John Martin Campbell.

Examples of such a hook can be seen in the photograph of Figure 20, an archaeological specimen in the Simon Paneak Memorial Museum, and in Figure 21, an engraving of a specimen collected in Barrow by John Murdoch in 1881 and now in the collections of the Smithsonian Institution.



Figure 20

Specimen of a *qagruksaun*.

Photo and courtesy Simon Paneak Museum.

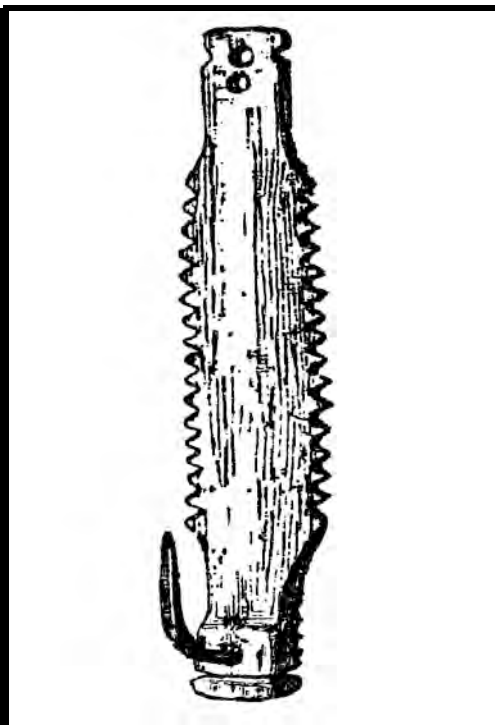


Figure 21

Engraving of a *qagruksaun*

Collected in Barrow in 1881.

Courtesy and copyright
Smithsonian Institution.

The Paneak Museum specimen is made from caribou antler and sports a barbless metal hook fashioned from a square nail. The lure has a narrow flat body, roughly rectangular

in cross-section, and a slight bow or curvature from end to end. It is thickest and broadest at the bottom, or distal end, where the hook is mounted through a drilled hole, and slightly thinner and narrower at the top or proximal end. At this top end were drilled three holes through which the tether line was threaded and tied off. The sides are shallowly notched, parallel to one another, to help in tying the bait to the shank so it would not slip off. The overall size of the lure measures 2 ½ inches in length, 7/16 of an inch wide, and 3/16 of an inch thick at its mid point.

Two other forms of hooked lures used for ling (Figures 22 and 23) are also illustrated in Murdoch, but it remains to be determined if the contemporary elders of Anaktuvuk Pass recall having seen these types of lures used among their people.

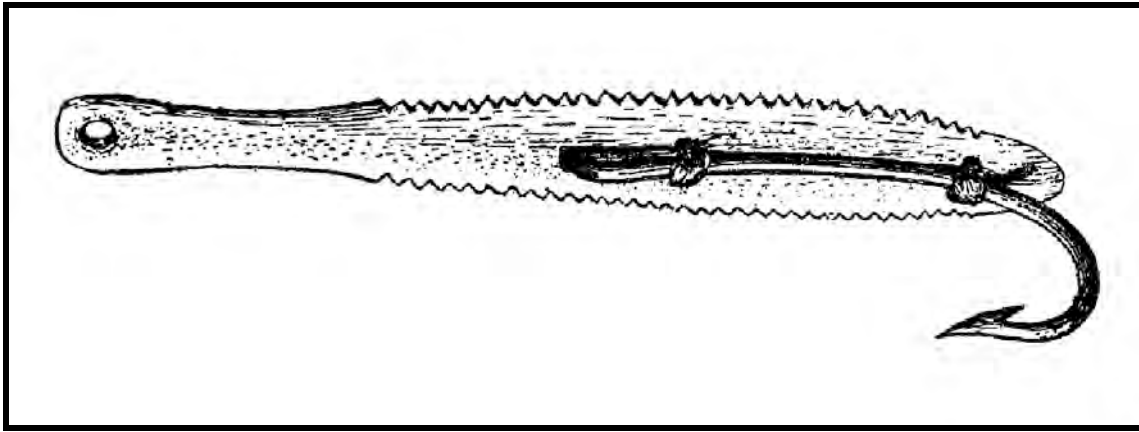


Figure 22

Qaġruqsaun, utqiāġvik, Barrow area.

Drawing courtesy and copyright Smithsonian Institution.

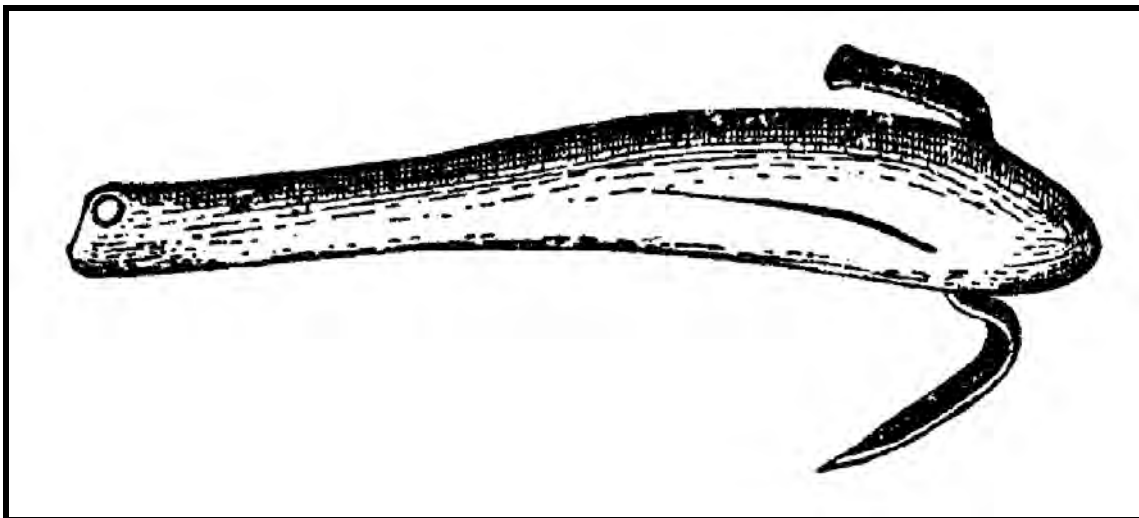


Figure 23

Qaġruqsaun, utqiāġvik, Barrow area.

Drawing courtesy and copyright Smithsonian Institution.

According to one man, the lure was customarily baited using what the Nunamiut refer to as *papigûq* (Figure 24). First, a several-inch-long hind section of a fish, complete with the tail, was cut away, after which the smaller top and bottom fins were removed (A). After the belly was slit open, the guts and bones were removed. (B) Next the belly was turned inside out so that the flesh was now facing outward. The *qagruqsaun* lure was then inserted. (C) And finally, this rear portion of the fish was tied tightly around the lure using a small string called the *qipiutaq* (D). It has also been pointed out that because such a baited hook was sometimes apt to float, people were sometimes known to add a little rock “inside” or under the bait to help it sink. The *qagruqsaun* was then ready for use.

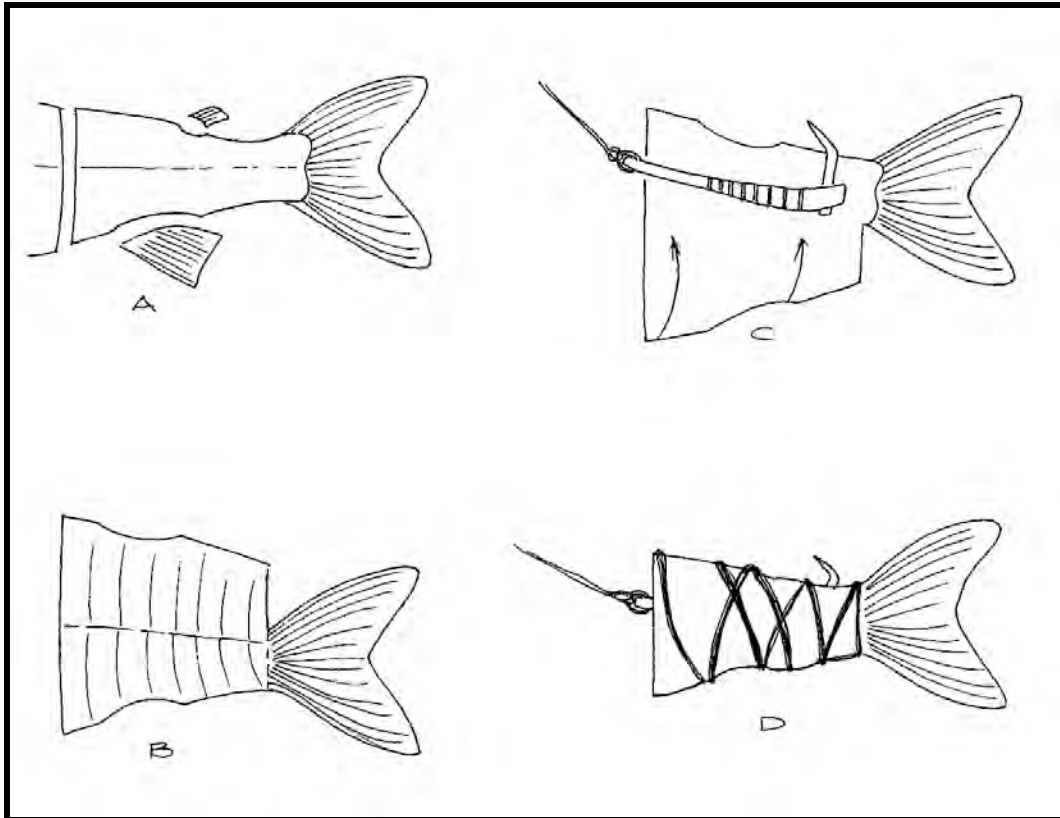


Figure 24
How a *qagruqsaun* lure was baited.

The *sannigûgiaq* type of lure was a three-to-four-inch-long bi-pointed bone or antler gorge, with a shallow groove carved around its middle to allow a short line to be attached to the main tether line (Figure 25). These gorges worked on the principle that once the bait was swallowed and the fish tried to swim away or spit it back out, the sharply pointed gorge would swivel or toggle—turn sideways—and get stuck in place.



Figure 25

Sannigugiaq gorges.

Photo courtesy and copyright Smithsonian Institution.

It should be noted here that the gorges illustrated immediately above are in the collections of the Smithsonian Institution. They were originally collected in the Norton Sound area and have been identified as having been used to catch seagulls. Nevertheless, they do serve to illustrate what the Nunamiut fish gorges looked like.

These gorges were presumably baited in a manner similar to the hooked lures, but since none of today's Nunamiut elders have ever seen one in use, no further information is available beyond this brief snippet from one man who noted that "In those days we always used home-made hooks made from a straight bone that is sharpened at both ends with a line tied to the center if it. Then it is wrapped with a piece of fish. When a fish swallows it, the hook gets stuck inside. That's how they catch the ling-cods" (Arctic John Etalook, pers. comm. 1982).

Sets

As we have seen, *qagruqsaun* lures could be used year round in the open waters of summer and the freshly ice-covered waters of fall, with the preferred locales in shallow near-shore inlet and outlet waters of lakes and quiet pools and backwaters in rivers and streams.

Fall ice sets usually involved chopping an *alluaq*, a roughly 12-inch hole, in the ice through which the lure was dropped down to the shallow lake bottom. As one man remarked, in fall "never put in deep water, something like 2 or 3 feet deep, under the ice, they catch 'em." The line was then tethered to an 18-to-20-inch-long wooden stick laid across the top of the

hole then frozen in place by covering the ends with snow and adding water. Interestingly, this cross-piece stick was known by two names: one as *pitugvik*, because it served as a secure tethering point, and the other was *saanigugiaq*, because it was laid cross-ways over the *alluaq* hole, much in the same way as the *saanigugiaq* gorge would turn cross-wise inside the fish once it was swallowed. This precaution was said to help guard against foxes or other night predators like weasels stealing the catch (Figure 26).

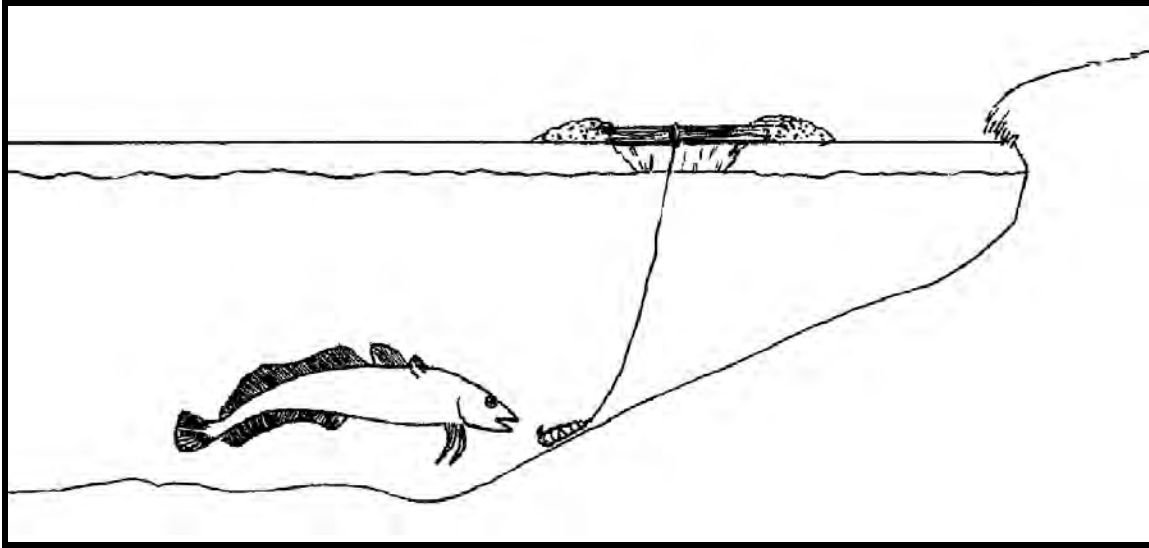


Figure 26

Typical fall *qaḡruqsaun* set with the *pitugvik/sannigutaq* frozen in place.
Drawing courtesy and copyright Simon Paneak Museum.

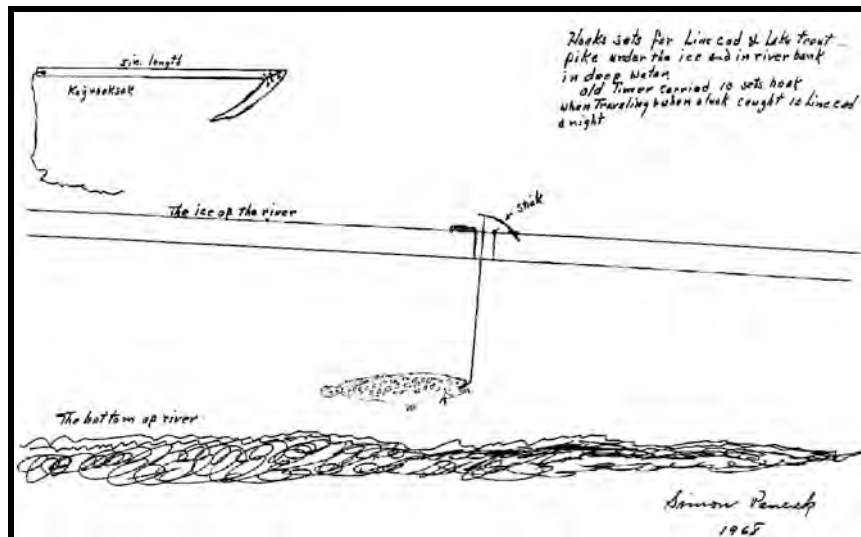


Figure 27

Another representation of a fall or winter set, drawn by Simon Paneak.
Drawing courtesy and copyright John Martin Campbell.

In summer, the land end of the line was either tied to a nearby willow or anchored to a wooden stake or *paugaq* driven into the ground, while the baited lure was thrown out from the shore. Summer sets show a bit more variability than the fall ones. While some people might prefer to set out one or even a series of several short, single-lure lines, other fishermen and women liked to set out long lines with multiple lures and floats, perhaps as much as 20 feet or more, as this passage illustrates from a summer spent one year in the Twin Lakes, Narvaqpak, area of the upper Koyukuk drainage:

That's how we made a living in the summer, putting out nets ... and baited hooks. My father always put some out with a long line ... with an anchor on this end. Then he puts all the bait hooks with half a piece of fish all in a row. Using a piece of wood for a float at the end of the line, a hand-made float with hand-made floats for each hook. When one catches a fish, its float bobs up and down.... They can catch many fish that way. (Arctic John Etalook, pers. comm. 1982)

Qaġruqsaun was once a vital and productive fishing method actively pursued by the Nunamiut, but those days are pretty much over now. In today's world, fishing is more of a pleasant diversion than the necessity it once was. Although some fall fishing is conducted with gill or more often dip nets at one or two locations, mostly it is done by jigging through lake ice in spring and fall and by rod and reel in summer. The use of *qaġruqsaun* is virtually nil. Even tastes have changed: when stacked up against the flavorful and handsome fish like the arctic char, lake trout and grayling, the homely, bottom-dwelling *tittaaliq* doesn't hold much status among young people today. Still, elders like to remember the pleasures of a well-boiled ling and the treat of *tiŋugaq*, and occasionally catch one to satisfy their craving. Some of the old men yet retain one or two old *qaġruqsaun* lures in their tackle boxes, and upon occasion a new one is made, but they rarely put them to use. Somehow, it looks as though both the fish and the lures that once caught them are going out of fashion.

Fish Traps

Taluyaq, cage-like, wooden fish traps set in rivers and creeks, is an ancient technology used, in one form or another, by virtually all of Alaska's Native peoples. Although details of size, shape, and construction varied from group to group, these traps all shared a handful of common attributes. First, they were one of the easiest and most efficient ways to catch fish ever devised. Second, they were customarily set up in mid-stream in conjunction with pole, rock, or brush fences that converged from either shore towards the trap and led the fish into it. Third, they were usually set up facing into the current to take advantage of seasonal fish movements out of lakes and down rivers and streams.

The advantages of these wooden traps over many other fishing methods are that people could either drive the fish into the trap or they could be left unattended, allowing the fish to effectively catch themselves while the people pursued other activities; they are

relatively easy to make and are much more durable and require much less maintenance than nets; lastly they can be used in areas where nets or other methods were either impractical or difficult, particularly in narrows or rocky shallow streams.

Among the Nunamiut in particular, the fish trap seems to have taken two distinct forms. One was the *taluyaq*, a relatively large, robust, all-season model, generally suited catching larger fish like *iqaluaqpak*, the lake trout (*Salvelinus namayacush*) common in deeper waters. The other was the *taluyauraq*, a much smaller, easily portable, and often conical trap ideally suited for shallow creek waters and the smaller fish one commonly finds there such as the arctic grayling (*Thymallus arcticus*).

Large Cylindrical Trap (Taluyaq)

The larger *taluyaq* were often, but not always, built of spruce wood, and characterized by a conical *igġiaq* or throat, inserted into the mouth or front end of the sturdy cylindrical trap. The amount of time and effort required to secure the materials, construct, and install a *taluyaq* often meant that these larger traps were cooperatively built and used and limited to a particular, though highly productive, seasonal locality.

As described in 1983 by Elijah Kakinya, a then quite senior elder who had built and used many such traps in his day, the main body of a typical *taluyaq* was cylindrical in form and could vary considerably in size. Those he and his associates built averaged about 8 feet in length and 3 feet in diameter, with closely spaced ribs (*tulimaat*) and external stringers (*taluyaa*) running the length of the cylinder as well as across the back end, and lashed in place with *quniguq*, caribou skin rope. Unlike the smaller *taluyauraq*, no nets were used or attached to hold the fish. Instead the main cylinder itself served to contain them.

The fore end of the cylinder, the *paana* or mouth, had a removable conical or funnel-shaped throat, called the *igġiaq*. It was built in the same rib and stringer manner as the main body of the trap, but it rapidly constricted down to a rear opening of perhaps 4 inches in the course of its roughly 2-foot length (Figure 28). As with the *taluyauraq*, several very thin and flexible 6-to-8-inch-long willow tips are tied to the ends of some of the *igġiaq* strakes so that they just barely touch at the apex of the cone, allowing incoming fish to pass easily through the throat but deterring them from swimming back out.

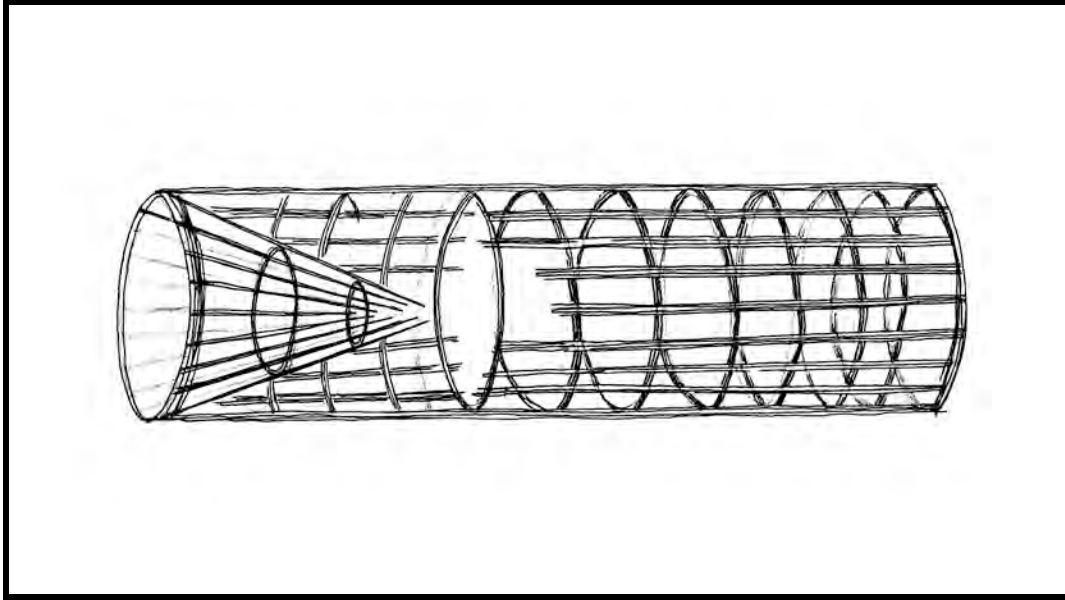


Figure 28

A cutaway view of a *taluyaq*, the large cylindrical trap.
Drawing and courtesy Simon Paneak Museum.

Like its smaller counterpart, the *taluyaq* was also used in association with a pair of fences that converged from either shore downstream toward the mouth of the trap. The main body of the trap was secured in place by four upright stakes or *paugaq*, one on either side of the mouth and another pair at the rear end of the trap. Three stout *ugruk* or bearded seal skin ropes, were attached to the mouth of the trap, two tied to the stakes that flanked it and a third attached to the top edge as a convenient handle.

When the trap was full, or nearly so, these lines were untied to haul the mouth of the trap clear of the water, the throat cone was removed, and the fish were ladled out with a *qalu* or dipper, similar in construction to the throat cone, measuring perhaps eight to ten inches in diameter and perhaps eighteen inches long and attached to a vertical wooden handle. Once emptied, the trap's throat was replaced and the trap lowered again to the stream bottom and secured.

But by virtue of their size, these larger traps required deeper water to be effective, thus the most favored localities included lake outlet streams, the mouths of quiet river sloughs, and tributary streams flowing into larger rivers: areas of water deep enough to cover the trap yet shallow enough to be easily accessible. That meant water not much deeper than 3 feet.

When fishing was over, the trap was removed from the water and stored ashore for the next season, while the fence was left in place to be washed away by the rushing waters of spring break-up.

Small Conical Trap (Taluyauraq)

The second trap described here is the *taluyauraq*. This was a small, easily portable model with a lightly built conical body of willow strips and a mesh net attached to the rear or tail end of the trap (Figure 29). It was primarily a summer implement, best suited for the shallow waters of small rivers and creeks to take small fish like *sulukpaugaq*, the arctic grayling (*Thymallus arcticus* Pallas) or *anayukaksruq*, the anayugaksraq char or literally “the old man fish” (*Salvelinus anaktuvukensis*).

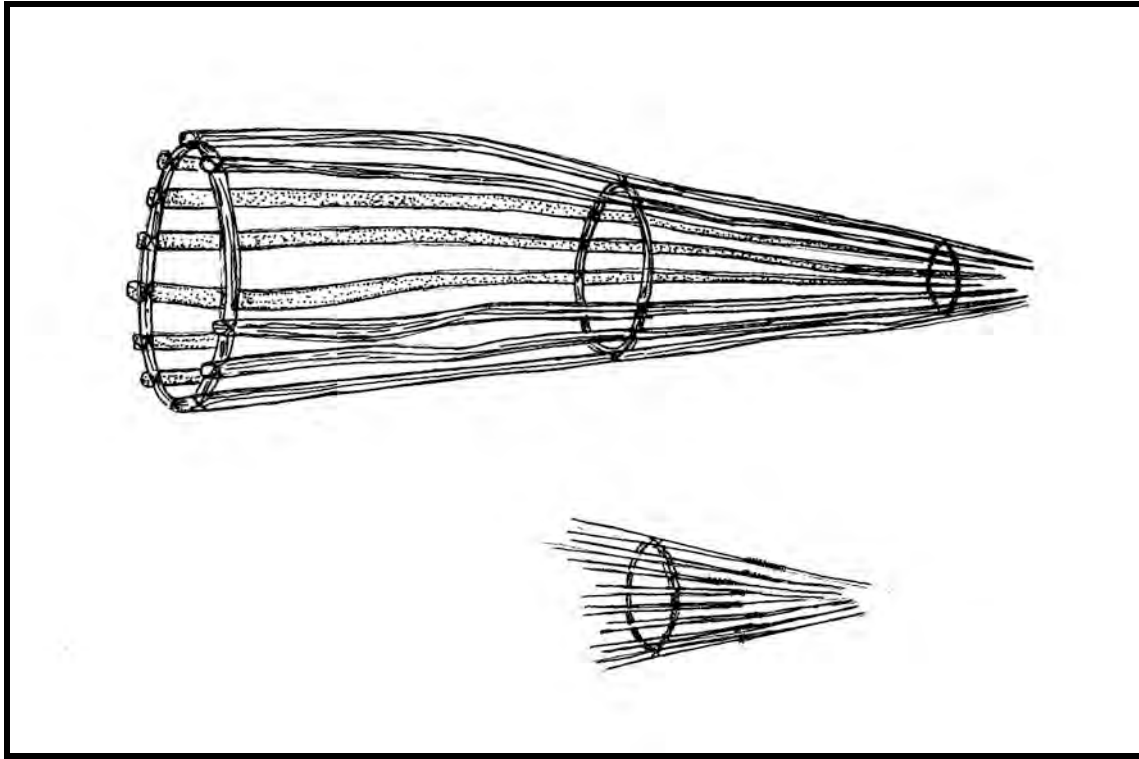


Figure 29

Taluyauraq, the smaller conical trap. Above: a cutaway view of the conical frame. Below: a detail of the attachment of willow stems to prevent fish from leaving the trap. Drawing and courtesy Simon Paneak Museum.

Perhaps the key attribute of this small, lightweight trap was that a hunter, his wife, or older children could easily carry it to a nearby fishing locality and set it up single handedly or even improvise one right on the spot, and harvest enough fish to fill a backpack or dog pack in an hour or two time.

The trap described here was made in the summer of 1993 by Justus Usisana Mekiana, a Nunamiut elder and craftsman. It is based upon ones he saw in use as a young man and in later years made and used himself. The main body of the trap is shaped like an elongated, open-ended cone, measuring 4 feet long. It is 13 inches wide at the mouth and tapers down to 4 inches across at the tail. It is built of *naunagaurat*, young, freshly cut willow

stalks, averaging 1/2 to 3/4 inch in diameter and bound to a set of three internal framing rings. These rings are referred to as both *tulimaat* or “ribs” by some people and *qiliqsruḡviich* by others, literally meaning “something to tie things to.”

From mouth to tail these framing rings measure 12, 8, and 6 inches in diameter respectively. Spaced roughly 18 inches apart, each one is fashioned from willow stalks cut to length. Several inches back from each end, the stalks are gradually beveled or thinned toward their tips. This thinning is done on the opposite faces of the stalk ends so that as they are bent around into a ring, the area where they overlap will form a smooth, tapered joint called *katchuq*. They are then lashed together with twine, which in earlier days would have been some sort of caribou skin line, either the thinner, string-like *nuluqsraq* or the somewhat thicker *quniguq*, or perhaps even *amaat*, thin willow runner roots, could have been used (Figure 30).

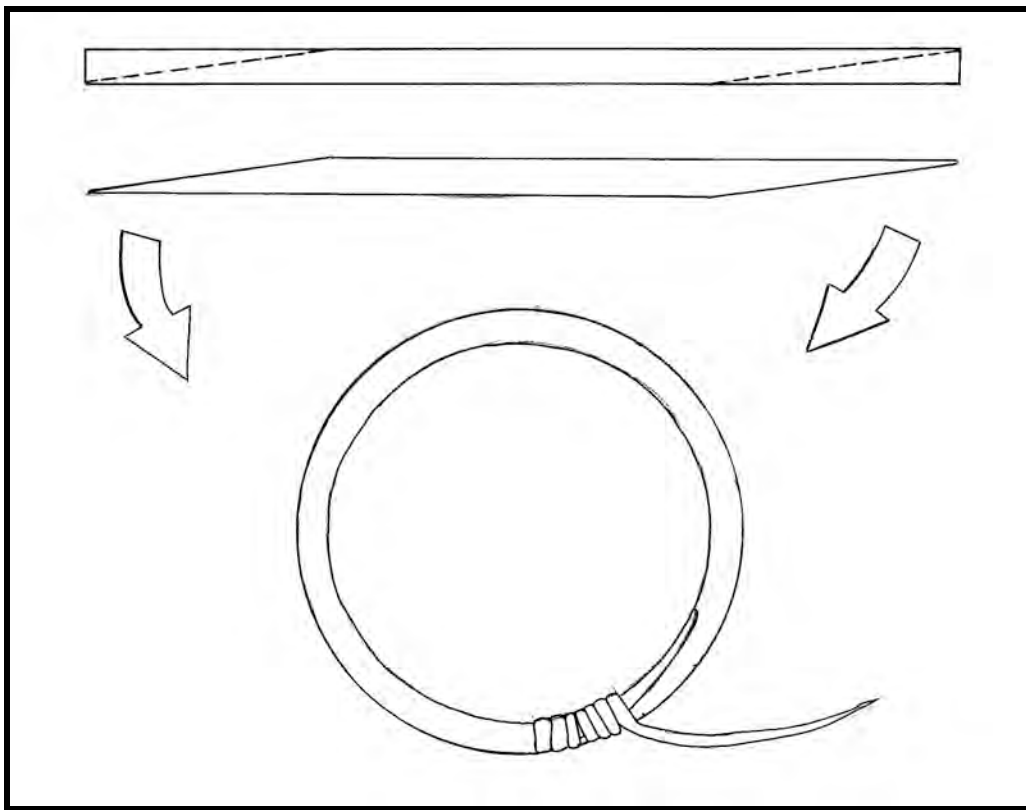


Figure 30

Illustrating how a willow stalk was cut on the bias (top) and lashed together to form an overlapping *katchuq* joint (bottom).

Drawing copyright and courtesy Simon Paneak Museum.

The trap strakes, which make up the cage-like body of the trap, are called the *taluyaa*. They average 3/4 of an inch thick at the large end and 1/4 inch at their tips. Some have been split or trimmed down from larger branches, but most are not, although all of them have been stripped of their bark. They are spaced an average 1 inch apart as they are

lashed to the mouth frame. Near the tail of the trap they are closely gathered and bound so that nearly all are touching edge to edge.

At the very tail or back of the trap is the narrow four-inch-wide *igġiaq* or throat opening through which the fish must eventually pass to enter the attached net. However, before the net is added, several very thin and flexible six-to-eight-inch-long willow tips are tied to the ends of some of the *taluyaa* strakes so that they just barely touch at the apex of the cone. Their purpose is to allow incoming fish to pass easily through the throat and into the net but to discourage them from swimming back out again.

The *kuvraq* or net attached to the main body of the trap reportedly averaged about 5 or 6 feet long. Elders caution that the net must be large enough and long enough for the captured fish not to feel too crowded. A short net makes the fish restless and try to swim back out of the trap, in spite of the willow-tip *igġiaq*. This is more of a concern when the trap is left untended allowing the fish to catch themselves in a leisurely fashion rather than when people actively drive the fish into the trap. On this particular trap the net was fashioned from a combination of mosquito netting and a canvas bag that measured some 5 feet in overall length, 18 inches of which extended up the tail of the trap. Interestingly, the bag grew wider as it extended back from the throat of the trap, reaching a maximum width of 2 1/2 feet, which gave the trapped fish a bit of extra room to swim around and kept them from trying to escape.

In earlier times the net could have been woven from a variety of materials, including stripped and twisted willow bark, which was said to have been very strong. Sometimes it was woven from twined caribou sinew (Gubser 1965:100) or, most durable of all, from strips of whale baleen traded in from the coast. Following the introduction and widespread availability of western trade goods beginning in the late 1800s, fine mesh mosquito netting became a popular material for this use, and it has also been reported that in the 1950s and 1960s some people even used chicken wire.

According to elders, perhaps the ideal setting for using such a one-man trap is in a small, shallow, relatively narrow section of a creek, channel, or slough not much over 2 feet deep but with a few deep pools and close to some sheltering willows. This is typically the kind of setting where grayling are plentiful, as are the materials to make a trap and its associated fence. Two localities in the Anaktuvuk Pass area that people often used for this were up Giant Creek just a couple of miles southeast of the village and at Come Out Creek perhaps five miles to the northeast of town.

Once a suitable location had been chosen, the fisherman quickly set about cutting willows to build a weir or fence constructed of bundled willow stalks lashed together by rawhide line or willow roots. Typically a willow bundle measured 4 to 5 feet long and 12 to 18 inches in diameter. In order to weight the bundles down, it was common practice to add two or three heavy rocks for ballast, working them deep into the willows.

The actual fence, known as a *saputit*, was constructed of two or more willow bundles that converge like a funnel from either shore toward the mouth of the trap. The trap itself is

located in mid-stream and oriented with the mouth pointed upstream, against the current (Figure 31). Elders say that because fish like to travel close to the bottom of the stream, the fence bundles should stand just a little higher than the top of the trap but not reach all the way to the surface. Once in position they were secured in place by driving pairs of *paugaq*, or wooden stakes, into the creek bed. A stake was placed on either side of the trap mouth, to which it was tied, with two or more stakes set on the back or downstream side of each fence bundle.

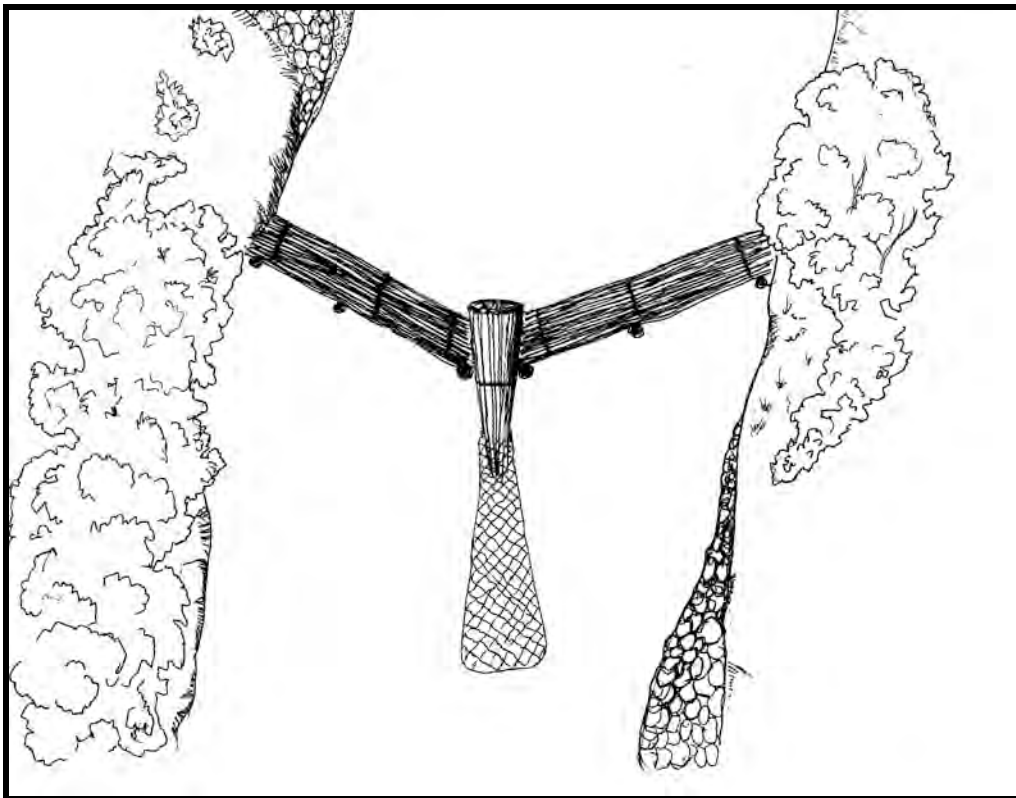


Figure 31
Illustrating the setting of a *taluyauraq* in willow-clad stream.
Drawing copyright and courtesy Simon Paneak Museum.

For broader creeks, where two or more sets of *saputit* bundles were needed on either side of the trap to reach the shore, the bundles were easily joined by jamming them together end to end. That way the rough-cut ends of the willow bundles naturally interlocked. If desired, the adjoining bundles could also be tied together for added security.

Once the trap and fence were securely in place, the fisherman would climb out of the water and walk upstream, taking care to keep his distance from the bank so that the fish could not see him or his shadow. This was done to avoid accidentally spooking them back upstream.

Eventually he would reenter the water and begin walking slowly back downstream, kicking, splashing, and sometimes even beating the water with a willow branch, driving

the fish before him and into the trap (Figure 32). This is a practice known as both *unjuraq* and *yalhaqtut*. How far upstream he would go to begin his drive depended on the circumstances. If many fish are visible in the stream, a distance of 50 to 100 meters should be adequate; if not many are to be seen, a distance of two to three hundred meters might be required.

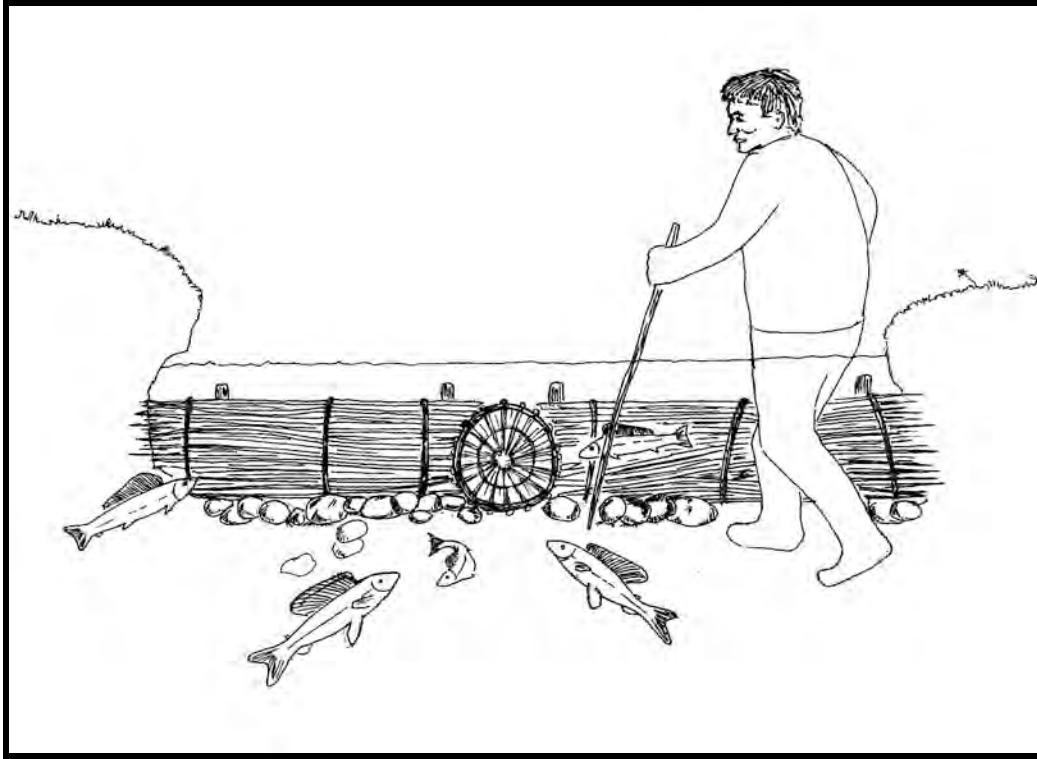


Figure 32

A fisherman driving fish into the mouth of the trap.
Drawing copyright and courtesy Simon Paneak Museum.

After a successful drive the trap is emptied, the fence disassembled, and the fisherman moves a few hundred meters further downstream, sets up again and repeats the process, known as *nuktaq*, as often as needed. Usually only two or three sets were necessary to catch all the fish a person desired, or in Justus' words, "pretty soon your backpack full. You quit!"

Another few minutes' effort and the was fence disassembled and discarded at the creek side and the hunter was on his way home with a full pack and the lightweight *taluyauraq* slung comfortably over his shoulder.

As we can see, fish traps have a history of ancient and widespread use. They are such an efficient and effective technology for catching fish that they still have not gone out of use in some areas of Alaska. Among the Nunamiut, it appears that they were still in common use up through the mid to late 1960s and perhaps in intermittent use into the early 1970s. In recent decades, however, following the replacement of dog teams with snowmachines,

the need for fish has dramatically declined. Today, most fishing is done for pleasure and a welcome change of diet, primarily by jigging through the ice in winter and by rod and reel in summer. Simply put, fish traps, whether the larger *taluyaq* or the smaller *taluyauraq*, have become unnecessary and as a result they have slipped out of use. Still, men like Justus know how to build them and use them, and as long as that kind of knowledge remains current in the community, *taluyaqtat* fishing can be revived at any time.

Fish Spears (*Kakiak*)

The *kakiak*, or three-pronged fish spear, was an implement of such reliable utility that it remained in use by the people of Anaktuvuk Pass until the very recent past. The *kakiak* was a simple and elegant implement comprised of a long wooden shaft tipped with a single center prong, flanked by a pair of slightly longer and outward curving flexible side prongs. The ends of these, in turn, are tipped with smaller inward curving barbs (Figure 33). The spear was designed so that when a fish was speared, the two flexible side prongs would “spring apart and allow the center prong to pierce him and then spring back so that the spurs either catch in his sides or meet below the belly” (Murdoch 1892:286-287).

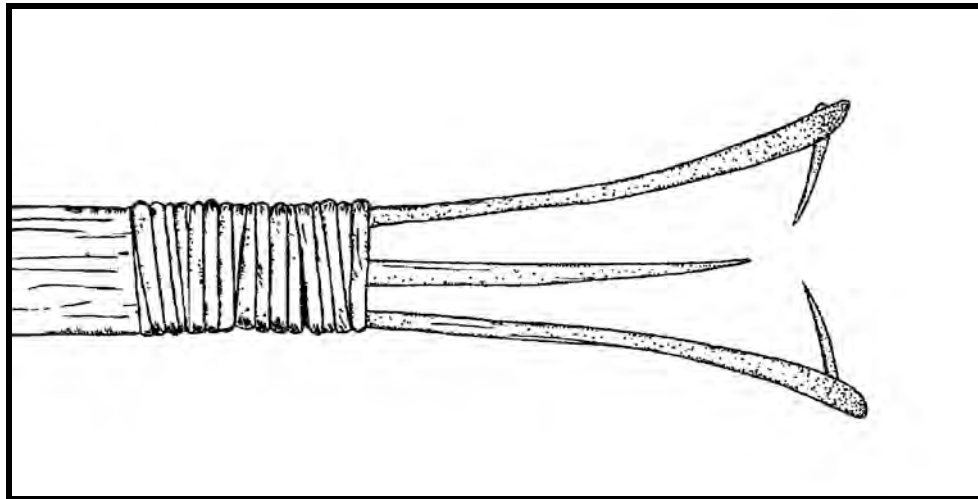


Figure 33

Kakiak, the three-pronged fish spear. Photo and courtesy Simon Paneak Museum.

The practice of spear fishing, or *kakiagniaq*- as it was known, was perhaps best suited for use in areas of shoal or relatively shallow water. It could be conducted at any time of year and under a variety of conditions, through lake and river ice in winter as well as along lakeshores and streamsides in the summer. The versatility and simplicity of both the spear's construction and its manner of use made the *kakiak* well suited for the traditional subsistence lifestyle of the highly mobile Nunamiut.

In traditional times, before the introduction of metal, twine, and other western goods, all the basic materials needed or used to construct or repair a fish spear were locally available to the Nunamiut. The wood for the shaft, caribou antler for the spear prongs, and caribou skins for the rawhide lashings used to join them securely together were easily obtained from the resources of the Brooks Range environment in which they lived.

The following description of the *kakiak* represents a synthesis of information drawn from an archaeological specimen, older written ethnographic accounts, recent interviews, and a pair of spears crafted within the past two decades by men who had grown up making and using them. The initial and general descriptions of these spears, names of their constituent parts, and details of their construction are largely based upon the oldest example, excavated from a site dating to around 1870. Following this are descriptions of the two more recent examples, comparing and contrasting their materials and manufacture with the archaeological specimen and with each other.

In this account of the *kakiak*, we will begin with a description of the spear shaft or *ipu* before moving on to the spear head. Virtually all shafts were prepared in the same way, but how the spear heads were made could vary somewhat from craftsman to craftsman and vary through time as well. There are three examples of spear head assemblies that will be described in detail to illustrate these differences.

The Spear Shaft (Ipu)

The spear shaft or *ipu* was customarily fashioned from a spruce sapling, although birch or willow could easily be substituted. The shafts could vary considerably in length, depending in part upon the available materials or the tastes and needs of the craftsman. Elders, most familiar with these implements remarked that 8 to 10 feet was a common length. Such shafts not only gave fishermen a long reach through even the thickest ice but also lent themselves for use as a *qulaaniun* by securing a fishing line to the butt of the shaft. Thus, the spear was quickly transformed into a long-handled fishing pole ideally suited for use in spring when fishing from the retreating edge of melting lake ice or when thin, dangerous ice bordered an area of open water known as *sikusuiḷaq* (Figure 34).



Figure 34

Sikusuiḷaq, or open water, a good place to use a *kakiak* or a *qulaaniun*.

Photo courtesy and copyright Grant Spearman.

New shafts were customarily prepared from a freshly cut tree by first stripping away the bark then working the pole down to a diameter of slightly greater than an inch or so, a size that would give it a comfortable heft and grip in the fisherman's hand. Then typically, as was done with other long-handled implements such as caribou and waterfowl spears, a knife blade was used to give the shaft a surface finish of very fine, regular, and subtle ridging. This texturing, *quagruliq-*, was added to improve a hunter's grip on the sometimes wet and slippery shaft, and as usual would have shown a high degree of care and workmanship. Finally, the shaft would often have been finished off with a coating of *ivisaag*, a reddish brown mineral stain, a form of iron oxide. To apply, a craftsmen prepared a mixture of *ivisaag* and water, then used the fur side of a piece of caribou skin to apply the color. After the *ivisaag* had dried, the man would *qivliqsaq-*, by using wood shavings to "rub in" the *ivisaag* with short quick strokes. This gave the wood a smooth, shiny finish that served as both decoration and as a sort of wood preservative (Figure 35).



Figure 35

Kakiak shaft colored by *ivisaaq* and with a subtly ridged, *quagrulik* finish.
Photo courtesy and copyright Simon Paneak Memorial Museum.

For a distance of some 2 or 3 inches back from the tip, the fore end of the shaft was carefully prepared for hafting the center and side prongs. First the top and bottom faces of the shaft were slightly flattened toward the tip, an effect called *amiññiq* that smoothly blends the contour of the foreshaft to nearly the width of the side prongs. Next a deep V-shaped hafting slot or *kakkisilīgvik* was cut into the end of the shaft to accommodate the *maññuq* or wedge shaped tang of the center prong. Finally, the sides of the foreshaft were flattened as very shallow stepped notches called *qilīgvik* were cut out to seat the bases of the side prongs (Figure 36).

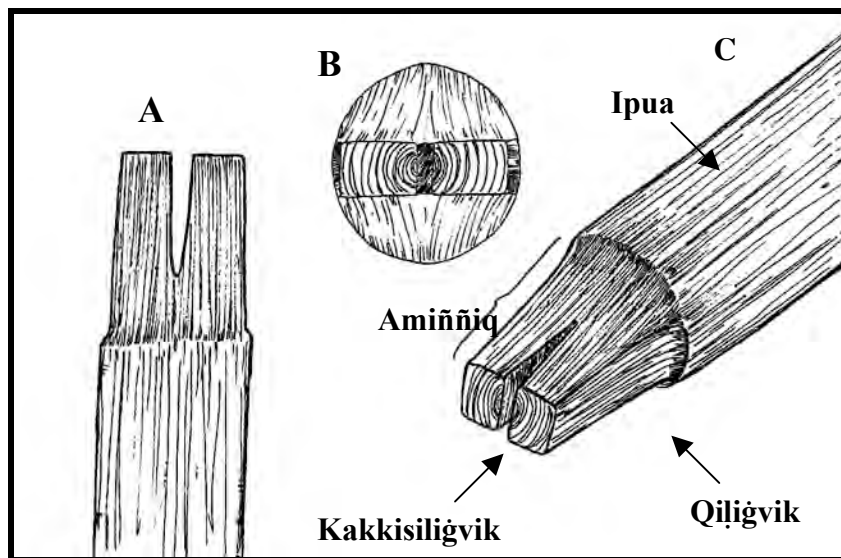


Figure 36

Detailed drawing of shaft end where the *kakiak* is attached.
Drawing copyright and courtesy Simon Paneak Museum.

Once the center and side prongs were seated and hafted to the shaft, then they are tightly in place with rawhide lashings, which the Nunamiut called *nimiġun*. Customarily made from the dehaired skins of caribou, these lashings were, according to elders, applied in a damp or half wet condition called *arruktaaġ*, which helped assure a tight fit because the lashings would shrink up as they dried.

When assembled and ready for use, the completed spearhead vaguely resembled the letter W with the two *akillġiik* side prongs projecting roughly 6 inches out from the end of the shaft and flaring to a 4 to 5 inch spread at their tips. There, they extended 2 or so inches past the end of the 4-inch long center prong blade or *kakkiñ* or *pana*, with the recurved end barbs reaching back within an inch or so of its tip.

The Spear Head

The head of the fish spear was comprised of five elements: A central prong or *kakkiñ*, sometimes also referred to as the *pana*; two longer and outward curving side prongs known to some as *akillġiik*, and two small inward pointing end barbs called *akikkak* by some people and *niksikkak* by others (Figure 37).



Figure 37

Kakiak parts from the archaeological specimen.

Photo courtesy and copyright Simon Paneak Memorial Museum.

In the archaeological specimen, all elements were made from caribou antler and are carefully finished with a very smooth and shiny surface texture characterised by fine and closely spaced parallel faceting that runs the length of each piece.

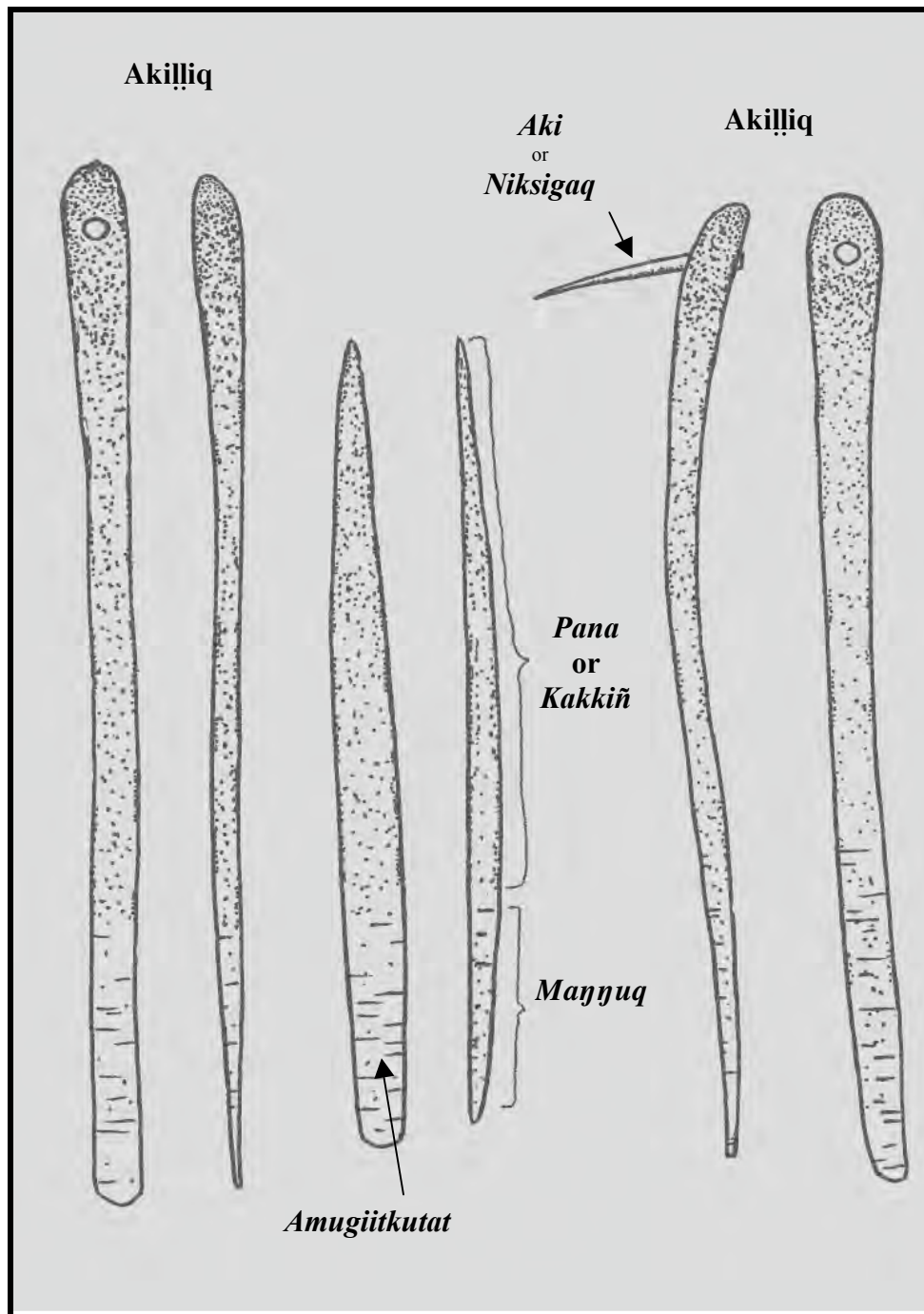


Figure 38

Detailed front and profile drawings of the *kakiak* parts seen in previous figure.
Photo and courtesy Simon Paneak Museum.

The *kakkiñ/pana* center prong takes the form of a relatively thin flattened rod measuring 6 inches in length, ½ inch in width, and ¼ inch thick. According to one elder, the length of the prong was traditionally measured as the distance from the wrist to the tip of the middle finger, with the tang or *manñuq* portion equal to the length of the middle finger itself. The *pana* or literally “spear” portion of the prong, which tapers to a sharp point at the tip, has flat sides and rounded corners or edges that give it a rectangular cross section. The bottom 2 inches of the prong, the tang portion, has been thinned on one face to produce a slightly wedge shaped base or stem so that it can be easily hafted into the hafting slot cut into the end of the foreshaft. To help in hafting, it has been scored with numerous scarf cuts or *amugiitkutat*. These shallow, closely spaced parallel cuts are cut from side to side across the thinned face of the stem. Their purpose was to roughen the contact surfaces between the tang and the hafting slot in order to prevent slippage and help assure a secure fit.

The *akilliigiik* side prongs, derive their name from a root word referring to things that are “across or opposite from one another.” They take the form of flat, slightly curving antler rods. They are flatly oval in cross section and have a very slight recurved or S shape to them when viewed in profile. They measure some 8 inches in length and average slightly more than ¼ inch in width and a little less than ¼ inch thick. The bottom 2 or so inches making up the base or tang of the prong has, like the center prong, been thinned on the inner face and scarred with scarf cuts to provide for a smooth yet secure junction with the shaft. At the other end of the prong, near the tip, it thickens and becomes more rounded in form over the last 2 inches, thus strengthening the piece for the drilling and hafting of the end barbs.

The inward facing end barbs were called either *akikkak* or *niksikkak*, names that mean “a pair of little hooks.” They were hafted in the side prongs through a small hole drilled near their tips and inserted point first from the outside face of the prong. These barbs, which measure roughly 1 ½ inch long with a maximum diameter of ¼ inch or less, curved down and inward toward the center prong. In traditional times, such end barbs were made of caribou antler or sometimes cut and fashioned from marrow bones. In later years they came to be replaced by metal nails, which could be easily bent to the desired shape.

If these old elements were used to rebuild a new spear, using dimensions approximating the hafting of the two more recent spears, it appears that the center prong would have projected out a distance of 4 inches. The side prongs would have extended some 5 ¾ inches out from the shaft, but the spread would have been quite narrow, only about 3 inches across, allowing the downward curving end barbs to come within just under ¾ inch of the end of the center prong.

A second example of a *kakiak*, based upon a somewhat different traditional pattern, was made by Nunamiut elder Justus Usisana Mekiana. It is based upon the ones he used as a small boy, which were made for him by his grandfather, Maptiḡaq Morry (ca. 1880-1957), who was an old time Nunamiu from the Killik River area.

This is a particularly interesting spear, because it differs from both the archaeological and the other recent example by the degree of flare of the side prongs and the way in which the end barbs are made and attached (Figure 39).



Figure 39
Kakiak made by Justus Usisana Mekiana.
Photo courtesy of the Simon Paneak Museum.

This spear measures 5 feet 10 inches in overall length, with a spruce wood shaft accounting for 5 feet 3 3/4 inches of it. The shaft averages 1 1/4 inch in diameter and has a nice finish, but the wood is left its natural color and lacks any *ivisaag* stain.

The hafting end of the shaft is much as described earlier and illustrated in Figure 36, with a gradual narrowing and “squaring” of the shaft towards its tip, shallow hafting notches cut into each side, and a deep center hole drilled into the middle of the shaft.

The center and side prongs are a bit thicker than the archaeological specimen. The center prong extends 4 1/4 inches out of the shaft, and the remainder is securely seated in the haft. It is round in cross section, 1/4 inch wide at the base, and comes to a very sharp point at the end.

The side prongs are each 9 1/2 inches long and average between 9/16 and 5/8 inch in width. In thickness, they vary from 3/16 inch at their hafted base to about 1/4 inch at their top ends. They are thinly rectangular in cross section, with slightly rounded edges. The bottom 2 3/4 inches make up the hafted portions, with the remaining 6 3/4 inches projecting out from the end of the shaft. In strong contrast to the archaeological prongs, with their very subtle flare, these prongs have a very pronounced outward flare. According to Mekiana, in order to get such a natural curve or flare, the side prongs should ideally be cut from the inner face of the main beam of a large bull caribou antler, as illustrated in Figure 40.

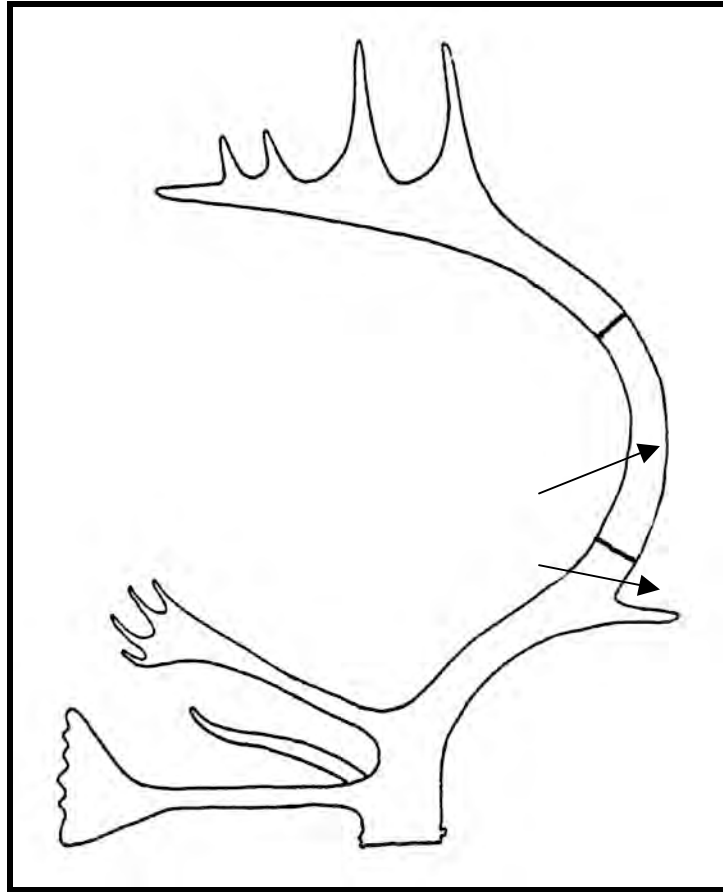


Figure 40
Illustrating where the side prongs would have been cut from.
Drawing copyright and courtesy Simon Paneak Museum.

Here, the prongs have a maximum external spread of 7 inches. The bases of these prongs were held in place by the shallow hafting step-notches cut into the sides of the shaft, as well as by a pair of small nails and 3 3/4 inches of lashing.

What makes this *kakiak* truly unique is the end barbs. Rather than drilling holes in the ends of the side prongs and inserting the barbs through them, these barbs were tightly lashed in place to the inner faces of the side prongs' tips. They are also longer, and extend much closer and at a steeper angle toward the central prong than the others.

These barbs are long (3 3/4 inches), thin, about 1/8 inch thick, flat-faced, 5/8 inch wide, and made with a slight projecting flange on their end so that they could be very securely lashed in place with *nuluksraq*, a thin but very strong caribou skin string (Figure 41).



Figure 41
Detail of the end barbs.

Photo courtesy and copyright Simon Paneak Museum.

The third example was made by Elijah Kakinya (Kakiñña) (1895-1986) and represents the integration and blending of modern, western materials with traditional ones (Figure 42).



Figure 42
Kakiak made by Elijah Kakinya.

Photo courtesy and copyright Simon Paneak Memorial Museum.

In this instance, the shaft was fashioned from a spruce pole measuring 5 feet 2 3/4 inches long and with a maximum diameter of 1 1/8 inch. Although it lacks the traditional coating of the reddish-brown *ivisaaq* stain, the shaft is nicely finished with the customary *quagrulik* ridging, although there are a few nicks and rough spots down its length.

Again, the hafting end of the shaft is much as described earlier, and illustrated in Figure 35, with a gradual narrowing and “squaring” of the shaft towards its tip, shallow, hafting step-notches cut into each side, and a deep center notch carved into the middle of the shaft.

Like the Mekiana example, the center and side prongs are a bit thicker than the archaeological specimen. The center prong measures 5 1/8 inches in overall length, 3 1/2 of which projects out of the shaft and the remainder is securely seated in the haft. It is 1/4 inch thick and 1/8 inch wide at the haft. All sides are flat and squarely edged but eventually converge to a very sharp point at the end.

The side prongs are each 8 1/2 inches long and average 9/16 to 5/8 inch in width. In thickness they vary from 3/16 inch at their hafted base to 5/16 at their top ends. They are basically rectangular in cross section, with sharply squared edges. The bottom 3 1/2 inches make up the hafted portions, with the remaining 5 inches projecting out from the end of the shaft. Here they have a maximum external spread of 4 1/2 inches and an internal spread of 3 3/4 inches. The bases of these prongs were held in place by the shallow hafting notches cut into the sides of the shaft as well as by three small finishing nails per prong and a wrapping of 1/4-inch wide rawhide line that extended from the base of the haft to the top.

The end barbs were fashioned from old-style square-cut nails that were first bent downward at a roughly 45-degree angle at about their mid-point and then inserted through holes drilled 1/2 inch down from the ends of the side prongs.

Winter Spear Fishing

In winter, these spears were used to take fish through openings in lake and river ice, either through deliberately chopped holes called *alluaq* or else at *sikusuiḷaq*, areas of naturally occurring open water caused by upwelling warm springs or by shallow and swiftly flowing waters that hinder ice formation. While *sikusuiḷaq* provided fishermen with immediate and relatively unhindered access to open water, a certain degree of caution is required when approaching the water’s edge. This is because of the presence of *qaṇattaaq*, an overhanging shelf of snow or ice that projects out a few inches to a foot or more from the solid body of snow or ice and may have been undercut from beneath. Moving too close to the water’s edge can result in an unwanted dunking in some very cold water. On the other hand, although *alluaq* holes chopped through solid ice offered fishermen a greater degree of safety, they also demanded a great deal more work and

effort to open up, particularly in late winter and early spring when the ice covering lakes and rivers may reach a thickness of as much as 6 to 8 feet.

Long before the availability of the gas-powered ice augers or even the introduction of steel-bladed ice chisels early in the last century, the Nunamiut laboriously chopped through the ice with a *tuuq*. This traditional long-handled ice chisel was customarily tipped with a blade of sharpened caribou antler, or perhaps ivory if one could afford it. As illustrated in Figure 64, the *tuuq* had a very long shaft, perhaps in excess of 8 feet, judging by this photograph. A key aspect of the *tuuq*'s effectiveness in penetrating the ice is the way that the shaft swelled and grew thicker and heavier toward the tip. This not only helped in securely hafting the point deep into the shaft, but it increased the weight, the momentum, and the striking impact of the blade as it was driven into the ice. This made it a very effective tool in the very tough and tiring job of chopping through a foot or more or even several feet of ice.

Elders who are experienced at this type of winter ice fishing are quick to point out two key points. Of prime importance is the need for the fisherman to be able to see clearly and deeply into the water, without having his view obscured by reflected surface light. Equally vital is for the fisherman to be able to conceal his own presence to prevent the fish from seeing either him or his shadow. Both of these needs were easily met through the use of a *taggialliragiitkun*, a shadow shade.

The simplest form of *taggialliragiitkun* was fashioned from one or more blocks of snow cut from a nearby drift and then positioned like a shield between the sun and the edge of the hole (Figure 43).

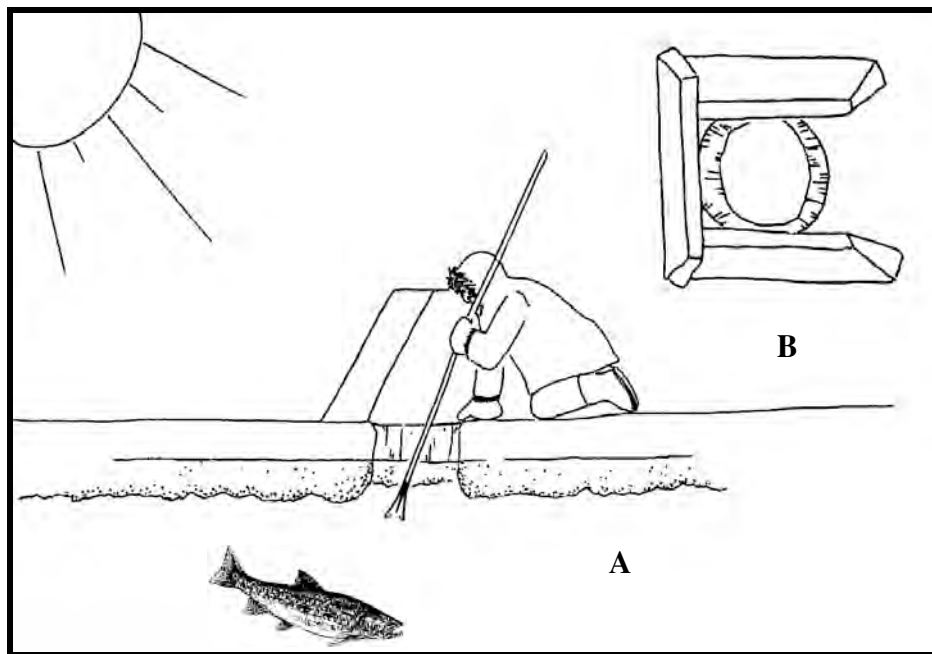


Figure 43

Fisherman using a snow-block *taggialliragiitkun*, A, side view; B, overhead view.

Drawing copyright and courtesy Simon Paneak Museum.

Unfortunately, exact details regarding the construction and use of a snow block *taggialliragiitkun* were unavailable because none of the men interviewed had ever used one. However, one man who is widely noted for his cleverness offered his best guess as to how it was used, and that information is presented here.

In this man's experience, during the sunless months of midwinter, the northern or "ocean side" sky is not as bright as it is to the south. Therefore, under these conditions he would place one snow block at the south edge of the hole, flanked by two others to the east and west to make a three-sided enclosure open to the north. Naturally, later in the season and once the sun has risen above the horizon, the blocks would be positioned so that his head faced in the direction of the sun.

He also offered the opinion that the bottom faces of the snow blocks should be cut at an angle so that the blocks sloped inward toward the top and project slightly over the edge of the *alluaq* hole to better shield the light. The walls, he thought, should rise to just a little under 3 feet tall, roughly the height of a man's head when kneeling forward, and when all three walls were in place their top edges would form an enclosure some 18 inches square, about the width of a man's parka ruff, which would also help to cut out unwanted light.

Alternatively, a more elaborate practice involved erecting a small, canvas-covered, hut-like screen over the entire hole to block out all light (Figure 44).

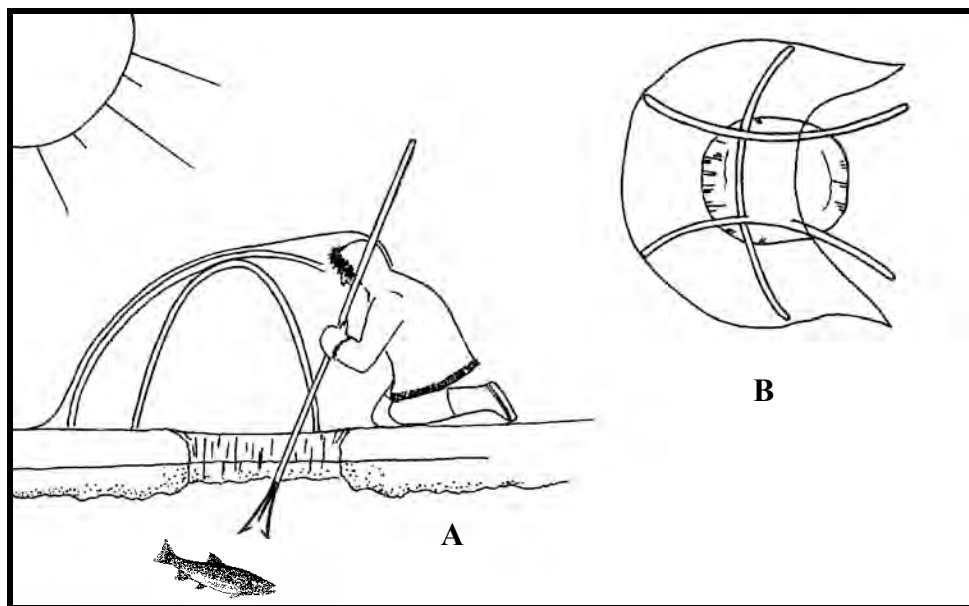


Figure 44
Fisherman using a *qaluugvigaaq* style of *taggialliragiitkun*:
A, side view; B, overhead view.
Drawing copyright and courtesy Simon Paneak Museum.

According to one very senior elder, the second form of *taggialliragiitkun* called a *qaluugvigaaq* was erected using two or three flexible willow branches called *qanak*,

which were bent over and frozen in place to the surface of the ice to form a small dome-like framework over the fishing hole. Then a dark cloth, canvas, or in the old days a caribou skin tarp, called the *matu* or lid was used to cover the framework and the head and shoulders of the fisherman, thereby blocking out nearly all light and eliminating unwanted reflections or shadows.

Once these problems of visibility and concealment were solved, elders described how the head of the spear should be positioned just below the bottom edge of the ice, poised for a quick thrust when a fish swam into range. Opinions diverge on the subject of whether or not bait was used in conjunction with the spears. One elder said it was not, and another man reported it was, citing the practice of jigging a baited line to draw fish into spear range or else by attracting them to a bone sunk to the shallow lake bottom just below the hole. The use of bait or a “brightly colored object” was also confirmed by Gubser (1965:100) One written source (Helge Larsen’s unpublished 1950 Anaktuvuk Pass field notes) records that “for winter fishing they used grayling as a decoy. The first fish they caught, they cut up, tied a piece to a string and dangled it in the water. At the same time they scratched the ice because the noise would attract the fish.” Where he cites the practice of scratching the surface of the ice to draw the fish’s attention, one very senior elder had never heard of such a thing and was of the opinion that the noise of the scratching would scare the fish away rather than attract them.

Whatever the arguments regarding whether or not and how bait may have been used in association with the *kakiak*, the basic fact remains that in experienced hands this implement could be depended upon to catch any fish that swam into range, bait or no bait.

Summer Spear Fishing

In summer, the *kakiak* could be used in shallow, nearshore waters by people in small boats as well as on foot. Spearing from a *qayaq* or *umiaqhiuraq*, a small umiaq, was most effective along lake shores or sloughs and backwaters of certain larger creeks and rivers, where ling cod and other fish lurk in the shelter of rushes and watergrasses. During periods of warm weather, shorebound fishermen were fond of stalking grayling, lingcod, pike, and the occasional lake trout as they moved in toward shore to feed near *nuiḷak*, the shallow waters at the source of a lake outlet stream, and *kuugum paṇa*, the mouths of inlet streams that flow into a lake from the neighboring mountainsides. It is here that young grayling and lake trout come to feed on insects, insect larvae, and other nutrients (Figure 45).

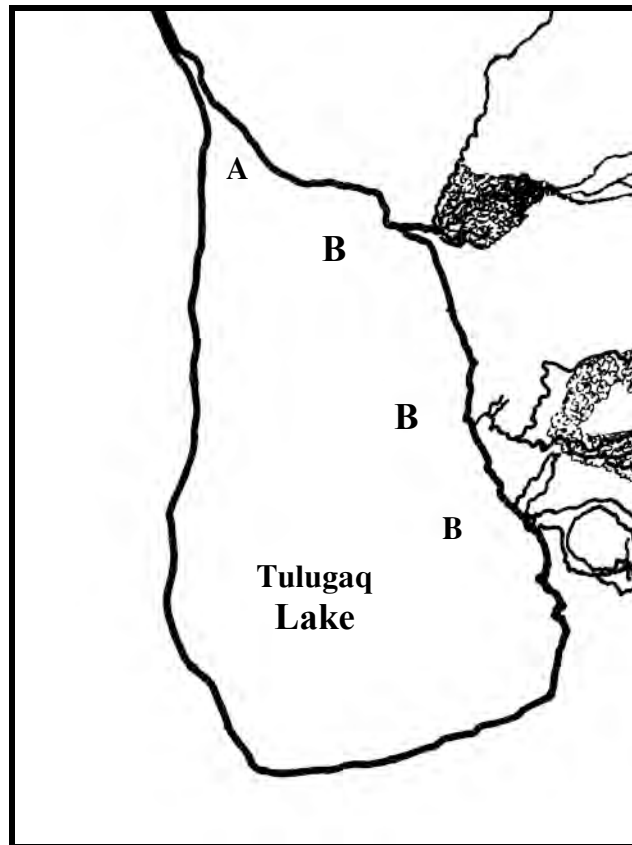


Figure 45
Illustrating the settings of (A) *nuiḷak* and (B) *kuugum paṇṇa*.
Map after Binford 1978.

Other productive areas included narrow and shallow stretches of *maqqiich*, outlet streams linking lakes with nearby creeks and rivers, as well as among *qaglu*, the quiet, deeper pools and backwaters which periodically occur along otherwise shallow and rocky stream beds.

Usisana Mekiana described the process of near-shore fishing one day to a group of young children gathered at the museum, demonstrating how to slowly approach on foot, from behind the fish. Gracefully waving his hand back and forth like the tail of a slow-moving fish, he began, “The grayling is like that. You see it sometime, and you sneakin’ like this, and sneakin’ like that...” — he gestures, holding the head of the spear close to the rear of the imaginary grayling, one hand near the middle of the spear, the other one close to his shoulder—“and you go like this...” —he makes a sudden jab with the spear—“you catch it right there.” If only it were that easy. To become a proficient *kakiagniaqti* fisherman takes time to master all of the aspects of the different ways in which the *kakiak* could be used, but once learned a person was virtually assured of catching his fish.

Overall, the *kakiak* represented a very useful and valuable all-season element in Nunamiut fishing technology, one that stretches far back into the distant past yet survived in common use up into the 1950s. Its basic form was likely refined and formalized long ago, changing little over the years, aside from certain small variations based upon the

personal tastes of the maker or those allowed by new materials such as metal nails. Whatever these minor changes, the *kakiak* served these people well for many generations before finally giving way to changing times and a changing technology. With the abandonment of their once nomadic lifestyle and the onset of settled village life, combined with the widespread availability of modern rods and spinning reels, the *kakiak* is now more of a museum piece than a current technology, recalled largely in the memories of elders once skilled in its use but no longer called upon to practice their skill.

Gill Netting (*Kuvraqtuqtuq*)

Since early traditional times, the Nunamiut have made and used three different kinds of fishing nets, gill nets, seine nets, and dip nets. Of these, by far the most common and perhaps the most utilitarian was the gill net or *kuvraq*. They were an all-season net readily used in summer as well as winter, equally at home in lakes, streams, and rivers, and in certain limited, circumstances on land, to net ptarmigan. They could be made to varying lengths and widths and woven in a number of mesh sizes, depending upon the type or size of fish they were intended to catch.

According to one senior elder these *kuvraq* nets were made in two basic sizes, the *kuvrauraq* and the *kuvrasugruk*, or quite literally “the little net” and “the bigger net” as defined by their respective mesh sizes (Arctic John Etalook pers. comm. 1983). The small meshed net, the *kuvrauraq*, also known, to some, as the *iqalugniugauraq*, was intended for relatively smaller fish such as *iqalusaaq*, *qaalgiq*, or the *qaaqtak* varieties of white fish. The large mesh *kuvrasugruk* was intended for large bodied fish such as the *anaaktiq*, the broad and lake whitefish, so much so that its other name was the *anaaktiqsiun* or “the implement with which to take *anaaktiq*.”

In the simplest terms a gill net was an invisible porous floating wall, or curtain, hanging vertically from the surface of the water in the path of migrating fish. As they try unsuccessfully to pass through the net, the individual mesh will spread far enough to allow the head and perhaps forebody, but not the rest of the fish, to pass through. As soon as the fish meets resistance it will attempt to back itself out of the net, only to find itself entangled and trapped by the mesh, especially when it catches on the backside of their gill openings. There they will remain until the net tenders check their nets and remove the fish for processing.

As such, the gill net represents a wonderfully productive technology, for it is simple though somewhat time consuming to make, fairly easily maintained and repaired, and when set in place allows people to engage in other activities while the fish catch themselves. How these nets were made, the details of their construction and materials, and their history of use by the Nunamiut people will be discussed below.

Gill Net Materials, Tools, and Construction

One of the key attributes of the gill net was that all the materials required for its manufacture were locally and readily available to the Nunamiut people. All they needed was wood for the floats and spreader bars and caribou for the rawhide frame, tendons for the netting mesh, and antler for the sinkers. The only nonmaterial requirements were the time and skill necessary to process these raw materials into a carefully crafted implement of subsistence and sustenance.

Gill nets, as traditionally handcrafted by the Nunamiut, were made in a variety of sizes, not only in regards to mesh size but width and length as well. According to Kakinya, the nets could vary from 15 to 20 to 25 mesh wide by 10 to 20 to 25 fathoms long. In his recollection, the larger mesh were reckoned, in the traditional method of body part measurements, as being three fingers wide, wrapped around twice. Paneak, on the other hand, indicates through some annotated drawings that there could a variety of mesh sizes for small, medium, and large fish ranging from an estimated three-finger width of 1 ½ inches to a four-finger 2 ½ inch mesh to the width of a clenched fist measuring in at a three-inch mesh.

Thus the largest mesh nets, using Paneak's figures, might measure up to 75 inches, or just over 6 feet wide, and using Kakinya's figures range from as few as 60 feet to as many as 120 and even up to 150 feet in length.

The typical *kuvraq*, as illustrated in Figure 46, consisted of seven basic elements: the *kuvraq* proper; the woven netting made up of individual mesh or *qimini*; the top, bottom, and side frame lines, or *qimini*, between which the netting was hung or attached; the upright wooden spreader bars or *ayauppiq* that gave the net its basic form; the wooden net floats, or *puktaugun*, attached to the top *qimik* line, the *kivitchiun* or antler net weights, attached to the lower *qimiq* line; and the *pituutaq* tether lines at either end of the net, one for the stone anchor weight or *kisaq* and the other running one by which the net was secured to the shore, usually with a wooden stake.

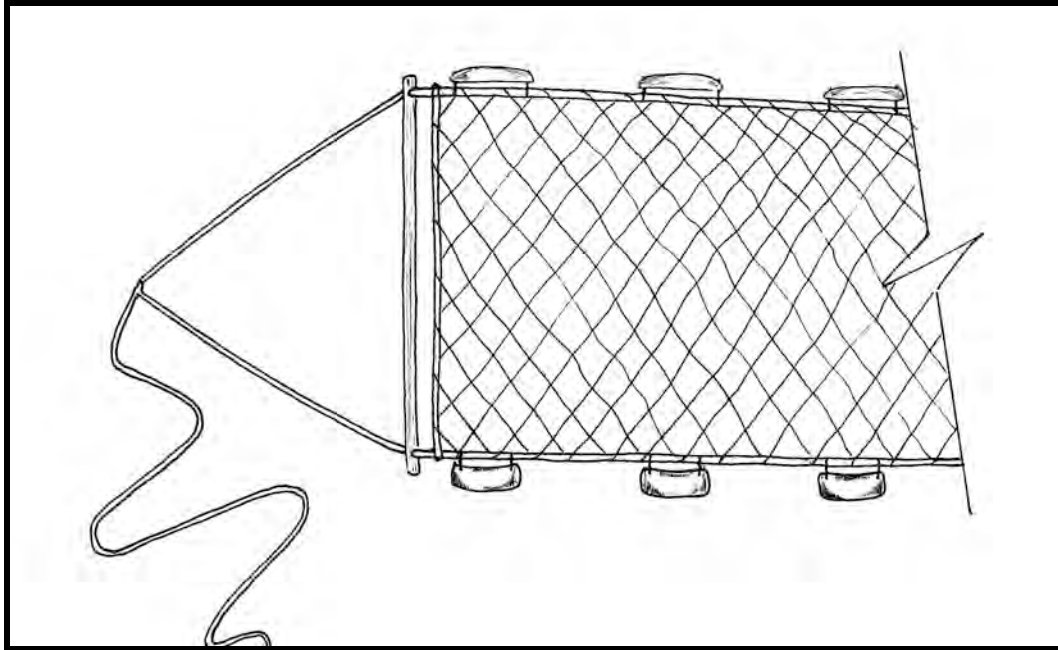


Figure 46

The basic form of a typical *kuvraq* net.

Drawing courtesy and copyright Simon Paneak Memorial Museum.

Most of the materials making up the net were derived from caribou. Hides, preferably fall bull skins because of their thickness and durability, were processed into a rawhide cordage or thong called *quniguq*. This could be done in summer by soaking a hide in water for several days until the fur slipped and could be easily separated from the hide in great handfuls (Figure 47). In winter, the process involved thoroughly wetting the skin on both sides, folding it in half from top to bottom with the fur side facing inward, and then rolling it up and storing it in a warm place (often hanging from the ceiling of the skin tent or sod house) for three or so days.



Figure 47

A handful of fur, fresh from a hide in the process of dehairing.
Photo courtesy and copyright of the Simon Paneak Memorial Museum.

The resulting dehaired hide, referred to as *utitchiaq*, was then processed into cordage by a rope maker and an assistant. First, after the neck and leg projections were cut away from the wet skin, a small slit was made in the middle of the hide then the cutter began making an outward oblong cut while he and the assistant held the highly fragrant hide (Figure 48) (fresh *utitchiaq* is quite pungently smelly and the job of being the cutter's assistant, usually one of his children, was never eagerly anticipated).



Figure 48
Making rope from *utitchiaq*, dehaired caribou skin.
Photo courtesy and copyright of Helge Ingstad estate.

This method of cutting was long ago devised to allow the rope maker to produce a continuous line of dozens of yards in length without any need for splices. The job of cutting the line required a high degree of concentration and coordination so that the line was cut to a uniformly consistent width or thickness. In the case of *quniguq*, this was accomplished by the cutter holding the knife blade upward, positioning the cutting edge of the knife blade under the thumb and using it as a guide to keep things at a uniform width, in this case about $\frac{1}{4}$ to $\frac{1}{2}$ inch. As the cutting progressed, the cutter and holder sat opposite one another, each pulling the skin tight between them with one hand, slowly rotating it as the rope was cut, and the assistant keeping a constant tension on the newly cut line with their other hand.

The Netting Frame and Mesh

The basic frame of the net, strung between the spreader bars to which the net was attached, consisted of four lines: the main head and foot lines that ran horizontally the entire length of the net and the two shorter, vertical end lines at either end of the net. Collectively they were known as the *qimiñi* or *qimiñ* lines. These represented the frame upon which the actual netting was strung.

In traditional times the netting mesh was painstakingly made of braided *niuliñigaq*, caribou tendons, preferably stripped from the legs of fall bull caribou, which yielded what is universally acknowledged as the strongest, most durable, and best quality material to be had.

While it fell to the woman of the house to dry, strip, and plait the tendons into the requisite quality and quantity of cordage (Figure 49), it often fell to her husband to actually weave the netting, and according to the estimate of one elder, one man might average about five days of sustained effort (Elijah Kakinya, pers. comm. 1984).

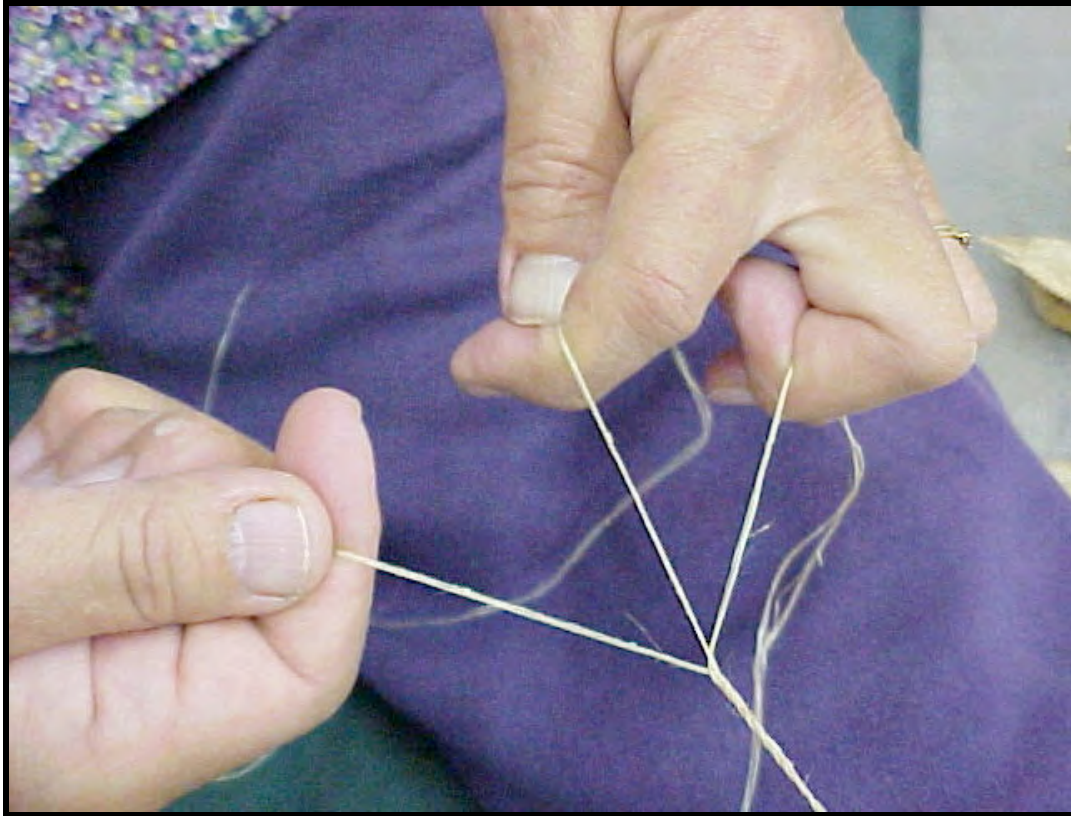


Figure 49

The painstaking process of plaiting three-strand sinew. Gill nets used four strands.
Photo courtesy and copyright by the Simon Paneak Memorial Museum.

In the absence of any current nets underway at the time of this research, the following description is drawn from Murdoch (1892) as being at least representative if not precisely descriptive of the process:

Two implements are used as usual in netting, a needle or a long flat shuttle for carrying the line, and a mesh stick for gauging the length of the mesh. The knot is the universal fishermen's knot, or becket hitch made in the usual manner. The method of using the mesh stick, however, is rather peculiar, and somewhat clumsy compared with that used by civilized net

makers, as it serves only to measure the mesh and not also to hold the successive meshes as they are made. It is a long flat piece of bone or antler, shaped like a case knife, with a square blade at heel and point. There is often also a little blunt hook at the point, bending upward or toward the back of the blade. The blade is the part of the stick which measures the mesh, and its length from heel to point is always precisely half the length of the mesh to be made.

It is used as follows: The workman holding the meshstick by the handle in his left hand, with the blade downward, catches the mesh into which the knot is to be made with the hook, and holds it while the twine is carried down to the left side of the blade, round the heel and through the mesh as usual, and drawn up until the preceeding knot comes just to the point of the blade. This makes a loop of the proper length for a mesh round the stick. The point where the next knot is to be made is now caught between the thumb and the finger of the right hand and the mesh stick taken out of the loop. The left thumb and finger, while the other fingers of this hand still hold the handle of the stick, relieve the fingers of the right hand, which goes on to make the knot in the usual manner. (312-313)

Each individual diamond-shaped mesh was known as a *nigaaq*- the term also used for both large and small animal snares. They were woven using a pair of tools known as the *nuvilllaun*, and the *nigivik*.

The *nuvilllaun* or the netting shuttle carried the supply of braided line used to weave the net. The example illustrated here is typical in form.



Figure 50

An ivory netting shuttle, or *nuvilllaun*, from a Nunamiut archaeological site.
Photo courtesy and copyright of the Simon Paneak Memorial Museum.

The *nigivik*, the net gauge, was used to assure that all the mesh were of equal size. Netting gauges could range from small, improvised squares of wood or antler held between the fingers, to much larger ones complete with a carved handles and an inset

gauge blade (Figure 48). Some were decorated with incised lines and design motifs as is evident in Figure 49.



Figure 51

A decoratively incised netting gauge blade.

Photo courtesy and copyright by the Simon Paneak memorial Museum.

A particularly interesting set of drawings done by the late Simon Paneak, and redrawn here, provide a very graphic portrayal of mesh sizes and how they were traditionally gauged using the old style of body part measuring.

As illustrated in Figure 52, a roughly 3-inch mesh, used for larger fish like the broad or lake whitefish, lake trout and the like, was calculated encircling a clenched fist, with the thumb resting atop the index finger.

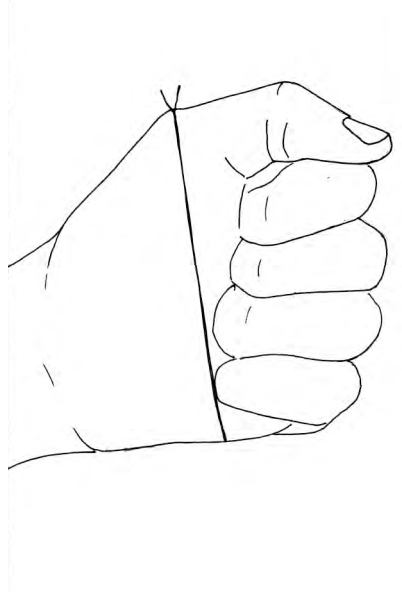


Figure 52

Mesh size measurement for larger fish such as broad or lake whitefish and lake trout.
After Paneak n.d.

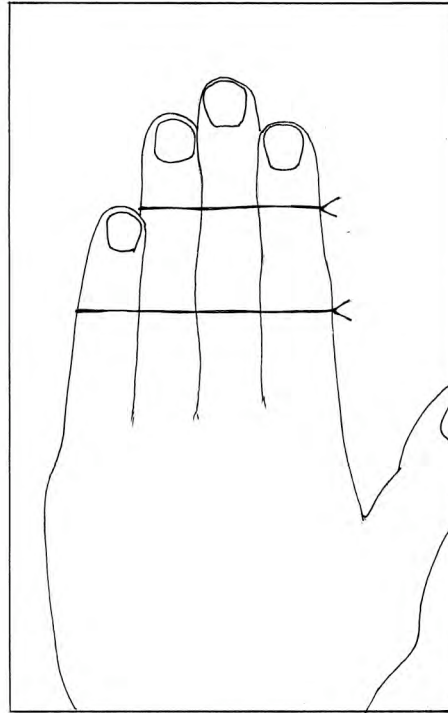


Figure 53
Mesh size measurement for smaller fish. After Paneak n.d.

Spreader Bars (Ayauppini)

The spreader bars, or *ayauppini*, were customarily fashioned from willow saplings, although spruce or even birchwood could also be used. In the interests of durability they usually averaged around an inch or so in diameter. As is typical of all Nunamiut tools and hunting implements, the spreader bars would have shown a high degree of workmanship, made as uniformly straight as possible and given a smooth, finely fluted finish. Their length depended upon the size or height of the net, but as a general rule they would measure between 4 and 5 feet tall. Holes were drilled near each end of the bars so that the top and bottom *qimiŋi* frame lines could be threaded through and tied off and then continue out for a few feet where they would be joined to the *pituutaq* tether line. The vertical endlines of the net were also tied off near the top and bottom of the *ayauppini* so that the netting was secure and not subject to excess play or stress.

Net Floats (Puktaugun)

The *puktaugun*, or net floats, were attached to the headline and served to keep the top of the net afloat at the surface of the water. According to one senior elder, net floats were

customarily or at least preferably made from spruce wood, particularly the large underground *mumiḡnaq* roots, whose densely grained wood was reportedly slow to absorb water, thus helping them remain bouyant during heavy use (Kakinya, pers. comm. 1984) While spruce root was preferable, it is also recorded that materials as divergent as willow (Campbell 62:287), cottonwood, or even cottonwood bark could serve the same role (Etalook, pers. comm. 1981). Again according to Kakinya (pers. comm. 1984), the wooden floats were usually oval shaped, about the size of a human hand and about 1 inch thick.

Based upon archaeological specimens it appears that there were at least 4 different styles of net floats used by the Nunamiut. Campbell (1962) illustrates and describes examples collected during the 1956 field season in the vicinity of Chandler Lake, some 35 miles west of Anaktuvuk Pass.

The first type he describes is made of sprucewood. It is subrectangular to not quite oval in shape, with long parallel sides and rounded ends, measuring $6 \frac{3}{8}$ inches long by $4 \frac{3}{4}$ inches wide and $\frac{5}{8}$ inch thick. "In cross section it is trapezoidal, being flat on one side, while on the other the sides slope upward around the perimeter to a centrally raised flat surface.... Lines were attached by means of two closely spaced holes at either end connected by a groove on the raised side of the float. The holes are slightly more than $\frac{1}{8}$ inch in diameter and were evidently drilled with a hand held, pointed implement" (Campbell 1962:286) (see Figure 54).

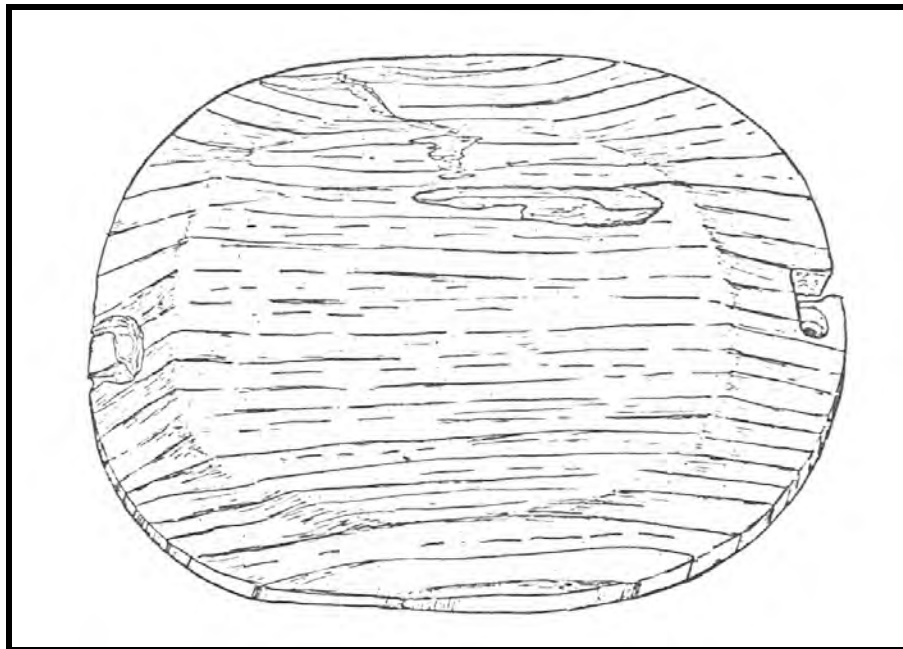


Figure 54
Type 1 Fish net float from Campbell 1962.

Campbell's second reported type of float, again made of spruce and again roughly rectangular with rounded off ends, was made by piecing two $\frac{1}{4}$ inch thick pieces of wood together with several small wooden pegs. It measures a bit over 5 inches long with a

maximum width of 3 inches and a maximum thickness of $\frac{1}{2}$ inch (Figure 55). According to Campbell, in cross section the float is rectangular; the thinning at either end of one side is noticeable in the figure. Again a pair of small-diameter holes have been drilled near either end for affixing to the net.

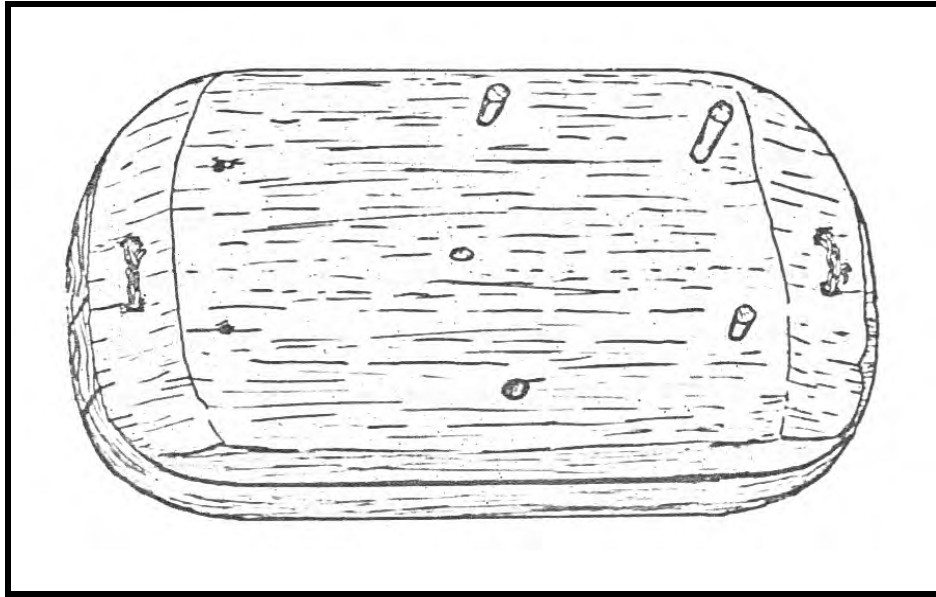


Figure 55

Type 2 net float from Campbell 1962.

A third type of float, this one of willow and again found on the beach of Chandler Lake, was basically cylindrical in form, measuring $3\frac{3}{4}$ inches long, $1\frac{3}{8}$ inches in diameter. It appears to have a shallow incised groove running the length of the float, and both ends have been slightly chamfered around their periphery. Attachment to the net would have been accomplished by running a line through single holes driven at an angle from one side of the float and emerging at the flat faces at either end (287-8, fig 8a).

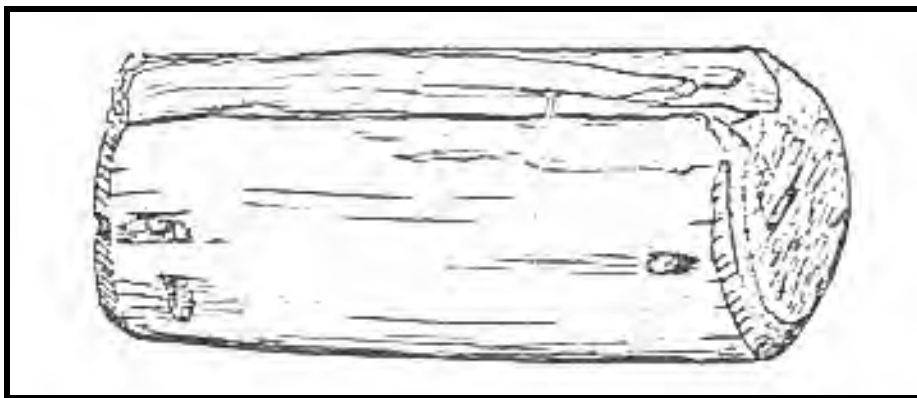


Figure 56

A Type 3 cylindrical wooden net float.
From Campbell 1962.

Another style of float was observed in a small cache of floats and net weights found at a Nunamiut campsite dating to the 1940s, in the Killik River valley some 35 miles west of Chandler Lake (Figure 57).



Figure 57

A cache of wooden net floats and antler weights near the Killik River.

Photo courtesy and copyright by Grant Spearman.

These floats, evidently made of sprucewood, were distinctly rectangular in shape with flat bottoms, but had a trapezoidal cross section due to thinning at either end that sloped upward to a centrally raised flat surface. Measurements taken on one of the floats yielded dimensions of $4 \frac{11}{16}$ inches long by $3 \frac{1}{8}$ inches wide and $\frac{11}{16}$ of an inch thick (Figure 58).



Figure 58

A pair of type four net floats and a net weight from the Killik River area.
Photo courtesy and copyright by Grant Spearman.

Net Weights

Kivitchiun (singular) or *kivvisit* (plural) were the weights attached to the footline of the net to keep it hanging vertically in place. Although rocks or pouches filled with sand could also reportedly serve as net weights (Kakinya pers. comm. 1984), *nagruk*, sections of caribou antler cut from the heavy main beam of the rack, were the preferred and most common weights used by the Nunamiut, as testified to by both oral accounts (Kakinya pers. comm., 1984) and archaeological specimens.

One typical specimen, recovered by Campbell at Chandler Lake, is described as being made from “a caribou antler midsection. A protruding tine has been removed by sawing. The sinker is 4 3/8 inches long, and has a maximum thickness of approximately 1 3/4 inches. In cross section it is roughly oval. A single line hole has been drilled at either end, extending from the side, through the hard outer shell of the antler into the softer center. The holes open in the soft material in the ends, and only slightly more than 1/4 inch of drilling was required in each instance. The line holes in this specimen are 1/4 inch in diameter, and were apparently drilled from only one direction” (Campbell 1962: 289) (Figure 59). The two other sinkers recovered nearby measured 3 5/8 and 8 1/4 inches long respectively.

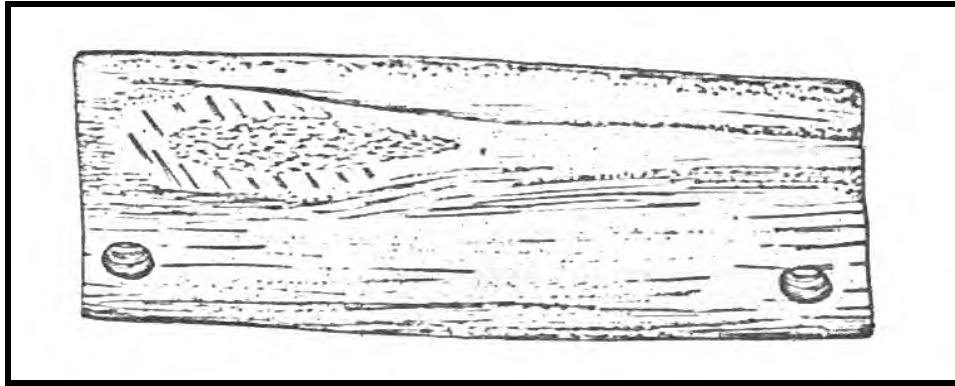


Figure 59
An antler net weight.
From Campbell 1962.

Another specimen, in the collections of the Paneak Museum and reportedly made and used by Simon Paneak, is cut from the lower main beam. It measures 10 cm long by a maximum diameter of 4 cm. It too is nearly oval in cross section (Figure 60).



Figure 60
An antler *kivitchiun*, or net weight, made by Simon Paneak.
Photo courtesy and copyright by the Simon Paneak Memorial Museum.

According to the late Elijah Kakinya, these weights were spaced about every 4 feet along the bottom of the net. (pers. comm.1984)

Summer Net Use

For ease, comfort, and productivity, summer probably represented the prime season for gill netting. In rivers and lakes alike, gill nets were easily set and tended by use of small watercraft such as the *qayaq* and the *umiaqhiuraq*, a small utility version of the larger *umiaq* freighting boat. Customarily, at least in a lake setting, this was done by a lone individual who worked himself outward from the shore along the length of the net, pulling up to the surface one small portion of the net at a time and disentangling any fish he may have caught from the mesh.

Lake sets tended to be located near or across the mouths of *maqpiq*, narrow outlet creeks linking to a nearby stream or river, areas where fish are regular travelers either into or out of the lake.

River sets were often, though not always, placed near deep pools or *qaglu* where fish like to gather and rest or close to the mouths of tributary streams and rivers flowing into a larger river, and where a nice deep channel runs near to a sandy or rocky beach. In earlier times, Nunamiut traders on their way to igliq spent much of their time gill netting the midsummer run of broad whitefish up the lower Colville River.

A typical river set had one end of the net anchored on shore by a long tether rope, or *pituutaq*, tied to a heavy rock or wooden stake. Then, using the boat, the net would be stretched out and set in the water at roughly 90 degrees to the shore and the current. The far end of the net was then anchored in place by another heavy rock at the end of its tether line. Depending on the strength of the current, the fisherman might once again check the net from a small boat as described above, but if this was problematic it made more sense to simply pull the net ashore, harvest the fish, and then use the boat to reset the net into the river.

The overall ease of use of these nets made them an ideal technology for elders, who could easily feed themselves, and any small children with them, for days if not weeks at a time. According to Arctic John Etalook, this was often the case in late summer and early fall, when elders and children remained camped at Uqsrukuvik, their boat cache site, while the more active hunters took off for extended periods to hunt caribou in the White Hills area to the east.

One time my grandmother Qaunnauraq camped there, setting up her caribou skin tent at the end of the little ridge when everybody else was going out to hunt fall caribou. Her son Kalayauq left her there; she wasn't able to take the trip out. So she stayed behind, an old lady Qaunnauraq. She lived on catching the graylings that were gathering on that creek.... That's how she survived while we were all out and when we came back she was fine. (Arctic John Etalook pers. comm. 1983)

Winter Net Use

In addition to their regular service in the open waters of summer, gill nets could also be employed beneath the ice covering both rivers and lakes throughout the winter months. It was a practice that required quite a bit of work by two or more people and some specialized gear to successfully deploy, retrieve, and reset the net beneath the ice on a daily basis.

Customarily such ice fishing began sometime in early to mid November, once it was judged that the ice was thick enough to safely venture out on, a thickness of at minimum 6 to 8 inches.

Foremost among the specialized tools were the ice chisel or *tuuq*, used chop through the ice to the water, and the *illaqtuun*, a very long handled pike or hook used to pull and set the net in position beneath the ice. Both of the implements are described in detail elsewhere and we will limit their discussion here to their actual use.

Preparations for setting the net began by selecting the location for its deployment and stretching it out to its full length atop the ice (Figure 61). After determining where they would locate the series of holes needed to set the net, the fishermen would take his *tuuq* and begin chopping his way through the ice. The first hole, referred to as the *alluvak*, was generally rectangular in shape, perhaps 2 by 3 feet in dimension. Then a series of smaller holes, or *ilaagtugviich*, were chiseled through the ice about every 4 or so feet apart (Elijah Kakinya, pers. comm. 1984). These smaller holes, whose purpose is described below, averaged only about a foot in diameter, although they could be made larger if the ice was especially thick to make handling of the *illaqtuun* easier.



Figure 61

Jesse Ahgook preparing net for deployment under the ice at Tulugaq Lake in 1950.
Photo by Laurence Irving, courtesy and copyright University of Alaska Archives.

Once the holes were completed, one fisherman would drop the net's anchor stone or *kisaq* into the water through the first hole while the second fisherman, sometimes known as the *illaqtuqti*, stood ready by the second hole with his long-handled hooked staff or *ilaqtuun*. Then he would use this implement to hook the anchorline and pull it towards him until he was able to pull a section of the line clear of the water. Then the other person would pick up the hook, move to the third hole, and repeat the process until the lead line had been fully stretched out from first hole to the last. At this point the lead line would be attached to the net and the net would be fed into the hole by one fisherman while the other pulled it towards himself. Once the net was fully deployed beneath the ice, the *pituutaq* lines would be frozen in place on the ice. Now the net would be left overnight or all day to be retrieved and checked the next day and reset again.

This daily setting, retrieval, and resetting of the net required some skill because the fisherman had to avoid freezing the floats to the underside of the ice, especially during extremely cold weather early in the winter when the ice is still growing and thickening. This was usually accomplished by adding some additional weights along the bottom of the net to keep the floats about a foot below the ice, but if unsuccessful there were few options other than to laboriously chop the net free or to abandon it in place.

The removal of the net from the water and preventing it from freeezing hard to the surface of the ice also required care, again especially during particularly cold temperatures.

As mentioned earlier, nets were set under both lake and river ice. River sets were quite common, especially along the lower Colville River during the years when many Nunamiut families were engaged in a prolonged period of coastal living between 1900 and the mid to late 1930s. Winter gill net sets occured at Tirragruaq, Tuigauraq, Kayuktisiluk, Isuuraq, and in many other places along the river. Customarily the nets were set close to shore from gently sloping beaches.

During this same period, lake sets were equally common because people often subsisted upon lake whitefish. The following account is taken from Jenness, who lived with a Nunamiut family near Cape Halkett over the winter of 1913-14:

“The eskimos who have been fishing here dug a number of holes in the ice about 25 yards apart, marking them with small sticks. They joined up the holes by a cord running underneath the ice, using for the purpose a pole about 24 feet long with a piece of wood 3 inches long lashed at an angle of about 40 degrees at one end. The end of the net is let down through one hole, and dragged by means of the cord to the next. The cords at each end are then made fast, either to the original “ground” cord or to the ice outside the hole”(Jenness, 1957:54-55).

He goes on to add that “the hole freezes over very quickly and the ice has to be broken afresh each time the nets are examined” (Jenness, 1957).

In addition to their use as described above, where the nets are set and people leave them untended overnight for the fish to catch themselves, nets were sometimes set under the ice, particularly in rivers, where teams of people actually drove the fish into the nets (Figure 62). Here in a drawing done by Simon Paneak, we can see a pair of nets set in place beneath the ice as described earlier and deployed parallel to one another across a river. Then, for some distance both up and downstream of the nets, a large number of additional holes were chopped through the ice, through which teams of drivers could plunge sticks to frighten schools of fish towards the set and awaiting nets.

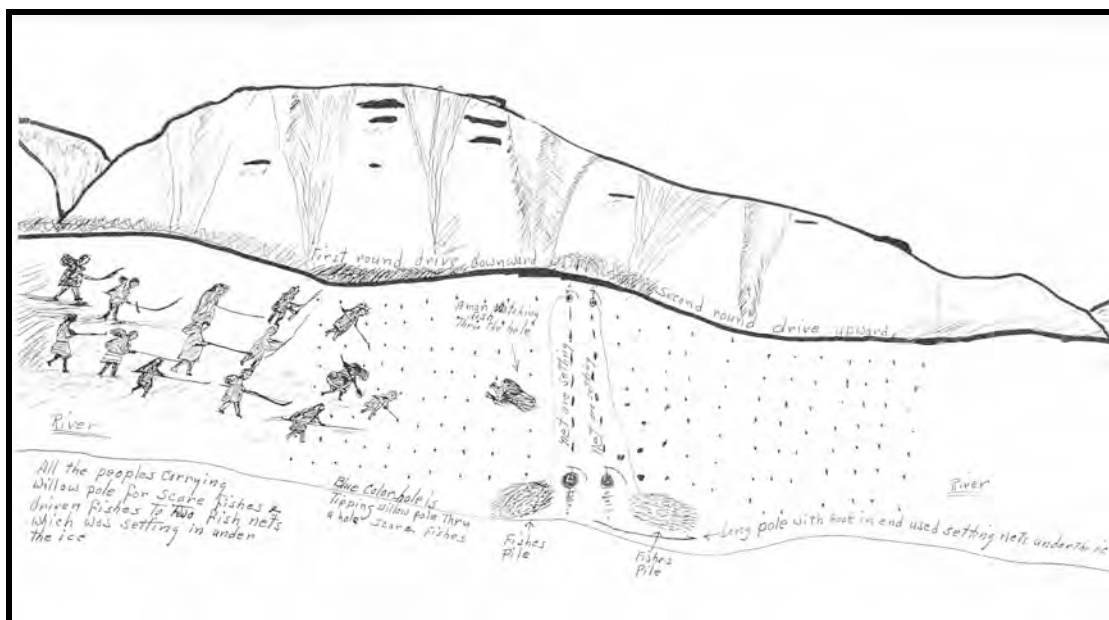


Figure 62
People driving fish towards nets set under river ice.
Drawing courtesy and copyright by John Martin Campbell.

As in summer, winter lake sets were most often placed across or very near the inlet/outlet streams of lakes where fish are most likely to travel.

Land Based Use

As mentioned in the introduction, gill nets also *occasionally* found use in the hunting of ptarmigan (*Lagopus lagopus*). Known to the Nunamiut as *qargiq*, the willow ptarmigan is a northern member of the grouse family of birds. Seasonally available in large numbers, especially in the early spring when caribou were often scarce, these birds represented an extremely valuable food resource that could be called upon to tide people over lean times until the caribou returned.

As a rule of thumb, however, people preferred not to use their fishing nets for such purposes because of the extra wear and tear that it involved. Families usually had nets specially made for netting ptarmigan as well as hares; however, in the absence of a dedicated ptarmigan net and if a pressing need arose, gill or sometimes even seine nets were put into service, at least in the short term. When used in this manner, the net was set up in close proximity to a large willow stand and strung out in a broad shallow arc. It was hung upright, with a slight forward lean, suspended by a series of sticks stuck deep enough in the snow to stay up, but still easily toppled over when the net was pulled upon. The long *pituutaq* tether lines usually led to a small blind made of snow or piled willow branches that people could hide behind and pull the net down once the birds were close enough.

The fact that ptarmigan are social birds and generally travel in large flocks, and that their preferred habitat is in large willow groves made them an ideal target for driving en masse into pre-set nets, and this is precisely what the Nunamiut used to do, as described by Arctic John Etalook (1984):

When people are ready to go after ptarmigan, when they are going to try to use the net for catching them, the ptarmigan are all around feeding, and they are running around on the low area. Those are the kinds of ptarmigans they look for, so when they start driving them towards the net, it would be just right. After setting the net before the ptarmigan came, after setting the net, they would begin to herd them toward the net, making sure they don't fly off. Running, doing the *sipukuk*-, feeding on the willow, whatever they feed on, they get closer to the net. They set the net up with poles so they can shove the ends into the ground, making them long, so when you shove the end into the ground the bottom of the net can touch the ground, and these stakes are sticking up, and they have these to stand the net, they have stick that keep the net up. They would stick the end of the stakes into the ground and that is how they set the net. Just like a net, they would set the net.

These make it solid when they put the stakes into the snow. Even when the snow is hard. After setting up the net, we decided to net some birds. We start driving the ptarmigan toward the net, they are eating from the willows, or whatever, in the low area, we set the net in a low area. They are feeding like that, and making sure they don't fly off, making sure we do not excite them, they usually start driving them toward that bird net over there. They usually like to herd them without a small group in front of the ptarmigan, but the ptarmigan have their own minds and they go on their own way. As a group, when they are almost to the net, without having a group leading the way, when they don't have too many leading the way, when they are about to hit the net, they do something, making the ptarmigan startled, they try to make them fly off. When they are trying to fly off they hit the net and by themselves they net themselves, however many ptarmigan they would net, even if there are many, they like to have them net themselves good. They say that when there is a group that are leading them they don't get too many, when the leading ones get caught in the net, these don't follow their lead. They like to have the ptarmigan stay in a group, because when they are in a group, they net a lot of ptarmigan.

They would run to them after they make them hit the net, startling them, running toward the net. And this way, toward themselves, they would pull the net down. They don't want them to fly, they would cover them with the net. They would start killing them after they covered them with the net. [Laughs] That is how they would get ptarmigan in those days.

Storage and Maintenance

Gubser writes that “the Nunamiut used to make a fishnet from sinew, but it had to be kept in the water all summer and was good for only one summer” (1965:100). It is an interesting piece of information, but unfortunately none of our living elders were able to confirm this statement because by the time they were of age, most nets were made of cotton twine.

Nevertheless, because even these modern twine nets were made of perishable materials and needed periodic repair, they were well cared for to make them last as long as practical. This care obviously began with great attention to preventive maintenance, immediately mending any tears or other damaging wear. Also of key importance was the need to periodically dry them out.

Ideally, if the family were at a long-term camp and had prebuilt drying racks, the nets would be strung over them; however, if they were at a short-term camp the net could just as easily be hung from nearby willow branches to dry.

Once fishing activities were completed, particularly in summer, the nets were pulled, cleaned, hung from willow branches, and allowed to dry thoroughly, then checked carefully and mended as needed.

Next the nets were stretched out on the ground and carefully folded before being put into their protective storage bags, usually a caribou skin dogpack known as *natmautik*.

The folding process began by taking one end of the net and folding it back upon itself for a distance of perhaps 12 to 18 inches, taking care that the nets and weights along the top and bottom edges matched up. Then still keeping the original fold on top, the fisherman grasped the next section of net from beneath and pulled, or folded, it back upon itself for another 12 to 18 inches, then repeated the process as many times as required to work from one end of the net to the other, resulting in a nicely folded pile of netting some 12 to 18 inches wide. The easiest way to envision how this is done is to recall how ribbon Christmas candy looks when viewed edge on. Once folded into this compact packet, some line was used to tie together the net at the top and bottom edges so it would not come unraveled.

This particular process of what might be termed layered folding was quite cleverly conceived because once the top and bottom tie strings were removed, the net could be quickly and easily spread by grabbing the end of the net on the top of the pile and simply pulling and walking as fold after fold unfurled without problem until the net was completely stretched out to its full length with nary a tangle.

Contemporary Practices

Clearly, the use of gill nets has a long history among the Nunamiut, but as might be expected both the nets themselves and their usage have changed over time. Where once in earlier days, these nets were laboriously handmade from dehaired caribou hide and stripped and braided sinew, the subsequent introduction of commercially available heavy cotton twine rendered the making and repair of nets a much less labor-intensive undertaking. Over time some people preferred, at least for a while, to make their own nets, even with these new materials, because of the comparatively high cost of commercially manufactured nets, but eventually the shift to manufactured nets took hold. Handwoven nets are now a rarity.

Today's factory-made nets are typically manufactured with the netting made of a strong monofilament framed by much heavier polypropylene rope, with lead weights along the foot and egg-shaped plastic floats on top. They are nothing if not durable, but despite these qualities there are few in the community.

In fact, compared with previous decades, the use of gill nets is relatively limited. It can be argued that this decline is directly related to the Nunamiut's abandonment of their nomadic lifestyle and shifting technologies. In the past people were entirely self sufficient and seasonally situated themselves in localities where fishing, and gill netting in particular, was a primary pursuit, not only to help feed their families but to also feed their teams of dogs. In recent decades, the settlement into a sedentary village, the passing of working dog teams in favor of snowmachines, and the availability of store-bought foods has substantially diminished the need, which is not to say the desire, for net-caught fish.

That having been said, the use of gill nets has never ceased entirely. There are numerous localities dating from the 1950s and 1960s and up to the present where gill nets have and, to a limited extent, continue to be used. Among them are Tulugaq Lake and Cache Lake. There may be more, but to date we have not recorded them.

In recent years, however, the use of gill nets has largely been limited to a small number of individuals, and overall it is fair to say that the convenience of hook and line fishing, whether by rod and reel in summer or by jigging in winter, has largely supplanted the use of netting in general and gill nets in particular.

Seine Netting (*Qaaqtuun*)

The use of seine nets, or *qaaqtuun*, was the second of the three net-based fishing technologies used by the Nunamiut. In many ways seine nets closely resemble gill nets in their basic materials, elements, and construction; however, they differ in some very key

respects. First, they are somewhat wider and quite a bit longer than gill nets. Second, they tended to be built a bit more sturdily, because of the relatively heavier wear and tear involved in their use. Third, seine nets have a much smaller mesh size, thus they act more as a strainer than an ensnaring device. Fourth, seines require the coordinated efforts of several people actively working as a team to successfully harvest fish, unlike gill nets, which can be set and checked by a single individual and once set, allow people to periodically harvest the resulting catch. One comes away with the impression that seines were less commonly employed than gill nets, because they were not quite as broadly applicable. They required more time, effort, and materials to make as well as more people and somewhat more specialized settings to be used.

Materials, Tools, and Construction

As with the traditional form of gill net, a thick caribou skin rawhide line, or *quniguq*, was used to make the basic net frame, with the netting itself woven of multistrand *ivalu*, caribou tendons. Similarly, the floats, or *puktagun*, were customarily fashioned of spruce or another suitable wood and the weights, the *kivvisit* were made from caribou antler, sometimes of Dall sheep horn, and if needed even with rocks as well (Elijah Kakinya, pers. comm. 1984). Eventually, like gill nets, seines made of traditional materials fell out of use in the early years of the 20th century when commercially made nets of cotton twine became widely available, and by the mid to late 20th century, monofilament and polypropylene nets became the norm.

The Netting Frame and Mesh

The frame lines, or *qimiñi*, outlining the top, bottom, and sides of the net were cut thicker and heavier than in gill nets to stand up the rougher use these nets were repeatedly subjected to. At either end were the wooden *ayaupiq* poles, or spreader bars, through which the head and foot lines were threaded and to which the end lines were tied. A few feet beyond the spreader bars the head and foot lines came together with an additional *pituutaq* or tether line used to maneuver the net when it was being deployed.

The net mesh, the *nigaq*, again was woven of caribou leg tendons, in the same manner and using the same implements as the gill net, but the mesh size was quite small, about 2 inches or less. An annotated drawing by the late Simon Paneak indicates that a seine mesh would be 1 ³/₄ inches (see Figure 63). According to Elijah Kakinya (pers. comm. 1984), mesh size, as reckoned by the traditional hand measurements known as *uktuutit nigaqtutillaanich*, was one finger wrapped twice around, or two fingers wide. Also according to him a typical seine net might measure 30 mesh high by 30 to 40 fathoms in length—a fathom being the equivalent of roughly 6 feet, or the distance from fingertip to fingertip at the end of a man's outstretched arms. Using these figures then, a seine net

might stand 52 inches, or just about 4 ½ feet high, by as long as 180 to 240 feet long. That is a lot of net, particularly if it is hand made.

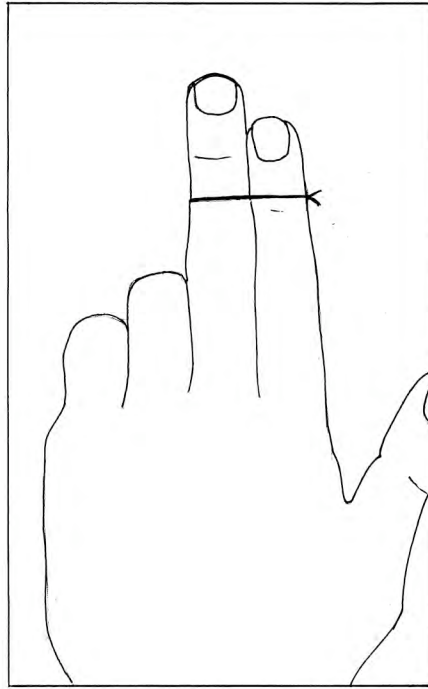


Figure 63
The relative mesh sizes for smaller sized fish like the round whitefish.
After Paneak n.d.

Net Floats and Weights

Floats, or *puktagun*, were generally of the same size and material as used on gill nets, but there tended to be more of them, spaced much closer together, in this instance approximately every 2 feet. Net weights, *kivitchiun*, again were made of caribou antler but tended to be a bit longer and heavier, perhaps 6 inches long rather than the standard 4 inches common to gill nets, and in this instance spaced about a foot to a foot and a half apart. Ideally the floats and weights should be closely paired up, opposite one another. If necessary, a series of fist-sized net rocks, or *kuvram uyaḡaṇa*, could also be tied on between the antler weights for added weight.

Summer and Winter Net Use

According to Kakinya, although seine nets could be used both summer and winter, they always required open water to do so, unlike gill nets that could set under the ice. They also required locations where people could actually see schooling fish below the surface

of the water, and involved a crew of three or four people to deploy and haul in. Seining was therefore a multiperson, energy-intensive activity and people needed to weigh whether, at any particular locality, there were enough fish to justify the amount of time and energy it would require to harvest them, especially in relation to other possible subsistence options.

In general terms, the basic strategy in seining is to stretch the net out along one side of a river, creek, or area of open water, then to deploy the net, initially by looping out behind the fish, then bringing the far end of the net down along their outer flank before returning to shore just upstream of the starting point. (One always drives fish in the direction of the current.) This formed a large pocket closed to the river and open to the shore. On broader creeks, rivers, or along the coast this was accomplished with the aid of a small boat such as an *Umiaghiuraq* or *qayaq*. On narrower and shallower waters, people could sometimes effectively wade across the channel or toss a rock tied to the *pituutaq* line attached to one end of the net to both get the net across the river or creek and back again to the side of origin. Once the fish were enveloped, people onshore began slowly pulling the net towards them, keeping the weighted foot of the net on or as close to the stream bottom as possible to prevent any fish from escaping.

In times past the Nunamiut used seines in a variety of settings: along inland rivers and creeks, along the lower portions of major rivers such as the Colville, as well as along the coast, with the latter two generally occurring in summer as people were engaged in trading activities.

Among the best remembered seining locations in the foothills and mountains were at Makpik, the mouth of little Chandler Lake, some 30 miles west-northwest of Anaktuvuk Pass; Tulugaq Lake about 12 miles north of the pass; Aaqhaaliuraq on the Anaktuvuk River some 50 miles north of the range front; and Iqaluich on Ikiaqpak Creek, a tributary to the upper John River some 20 miles south of the summit.

During deep winter, opportunities for seining diminished considerably, but still localities such as Aaqhaaliuraq and Iqaluich on Ikiaqpak Creek could occasionally be used.

As described by one man, in his mind the ideal seining locality, at least within the mountains and foothills, is one where the river channel is neither wide nor especially deep, not much over 2 to 3 feet, free of snags, and with a current that is not too strong. An additional advantageous condition is for there to be a change in streambed gradient, so that there is a sizeable pool of deeper water in which the fish are naturally drawn to rest and school.

The activities described below occurred in the 1960s using commercially made nets with homemade wooden floats along the headline and antler net weights along the footer. To the best of this man's recollection, the nets were about 4 feet wide and roughly 60 feet long. Interestingly, this same individual mentioned that on more than one occasion when dedicated seine nets were unavailable he participated in seining activities using long lengths of mosquito netting instead. If, upon occasion, people lacked nets long enough to

span a creek, it was not unheard of for them to use rocks from the creek bed to build a small wall, or weir of sorts, to shorten the distance they needed to span with their net. They could also help themselves by having people on either shore using their long willow poles to slap and poke the water in order to move the fish closer to the middle of the stream.

According to him, a group of two to three people would select a location, making certain the creek channel was not bordered either by an overhang of ice or a dirt embankment, both of which could make the landing of the fish-filled net difficult. If necessary they could use an axe to clear a larger area of open water and to eliminate any ice overhangs.

Then, in an area where the creek bed shallows out just upstream of a deeper section, one end of the net is securely anchored, with the rest of it ready to be uncoiled. Once the net was ready for deployment, another group of people would start making their way upstream, driving the fish before them in a process known as both *ujuruq* and *yalhaqtuq*. This could be accomplished in a number of ways: in some instances a person or two might get into the shallow water splashing and kicking and whipping the water with a branchy willow flail. Alternatively, people on either side of the channel could stay on dry ground as they walked downstream, again using willow branches and sticks to beat and agitate the water. A third technique again had people on either side of the creek with a rope stretched between them, flipping it up and down into the water as they made their way downstream.

As soon as the fish approach the seining area, a person at the free end of the net either makes his way across the creek or throws a line attached to the free end of the net to another person already across the creek, who quickly pulls the net across then begins to walk back upstream and eventually back across to the original side of the creek to completely encircle the fish. From this point things got a bit hectic as everyone worked together to pull the net ashore while keeping the weighted foot of the net as close to the bottom as possible to prevent any fish from escaping.

Once the fishing was complete, the net was hauled ashore, stretched out, inspected, and cleaned of any algae, weeds, or sticks, and its overall condition was assessed, taking note of any needed repairs before its next use.

After these tasks were completed the net was carefully folded up so it could be quickly and easily deployed the next time it was needed. The folding process, called *imu*, began with two people at one end of the net, each taking hold of the top and bottom edges and folding it back upon itself for a distance of perhaps 12 to 18 inches, taking care that the nets and weights along the top and bottom edges matched up. Then still keeping the original fold on top, the fisherman grasped the next section of net from beneath and pulled or folded it back upon itself (the original fold) for another 12 to 18 inches, then repeated the process as many times as required to work from one end of the net to the other, resulting in a nicely folded pile of netting some 12 to 18 inches wide, in the same way as gill nets were folded. The easiest way to envision how this is done is to recall how ribbon Christmas candy looks when viewed edge on. Once folded into this compact

packet some line was used to tie together the net at the top and bottom edges so it would not come unraveled.

In traditional times, the net would then be stored and transported in a caribou skin bag or *puuq* or sometimes in a caribou skin dog-pack or *nanmautik*. In later years containers could range from canvas bags to cardboard boxes.

Nowadays, seining is still practiced to a limited extent among the people of Anaktuvuk Pass, and remains a periodic, if not necessarily frequent, activity. It is most often pursued in late fall and again in spring at the previously mentioned Ekokpuk Creek. There people will harvest quantities of grayling and old man fish to enjoy.

Dipnets (*Qalu*)

Qalugiaqtuq, the use of dip nets or *qalu*, was another traditional fishing method used primarily in summer to generally take small fish like grayling or old man fish, a form of dwarf arctic char, from settings like small narrow creeks, lake outlet streams, sloughs, or deeper pools in small rivers. It appears to have been common practice, but not exclusively so, for one person to dip the net into the stream while one or more assistants drove the fish towards and into the net, either by throwing rocks, flailing the water with willow branches, or simply walking through the water, as the first person scoops the fish out.

As described by one senior elder (Elijah Kakinya, pers. comm., 1984), such a net consisted of a long-handled shaft with a roughly 18-inch wide wooden hoop at one end, to which a 4 to 5 foot long conical net was attached.

The handle or *ipua* was typically fashioned from a 6 to 7 foot long willow or spruce pole stripped of its bark and carefully worked with a knife blade to a diameter of between 1 ½ to 2 inches so that it fit comfortably in the hand and gave a good grip. One end of the pole was then carefully split down the middle for a distance of perhaps 3 feet, then carefully shaved, thinned, and worked to roughly a finger's width. This left them strong yet pliable and flexible enough that they could be spread and bowed out to form the net hoop, or *qaluyaam qiruktiŋa*, sometimes also referred to as the *qaluum kiavsaagviŋa*, held together by a several-inch-long overlap joint that was secured by a combination of wooden pegs and rawhide lashing. For added strength, a reinforcing spreader bar or *sannigutaq* was lashed in place near the base of the hoop.

The netting or *kuvraq* was, as mentioned above, roughly 4 or 5 feet long and conical or funnel shaped. It was painstakingly woven for durability from braided sinew stripped from the legs of fall bull caribou, with a very small size mesh. The top corner of each individual mesh at the mouth of the net was tied directly to, or around, the hoop with sinew.

Little else is known of these implements, and no pictures or drawings of them exist.

Gaff Hooks (*Agaun*)

The use of gaff hooks, or *aağaun*, appears to be of relatively recent origin, made practical and popular after the introduction of metal in the late 19th and early 20th centuries. Among some people these were considered to be a very effective method of taking fish.

Elijah Kakinya, born in 1895, saw two forms of the gaff in use when he was growing up. A long-handled version was favored in summer for hooking or snagging fish in shallows and quiet pools in rivers and streams, while a shorter handled one was reportedly used in winter to take fish through *sikusuiḷaq*, areas of open water in otherwise frozen lakes, creeks, and rivers.

The short-handled versions ranged from 2 to 3 feet in length, with the long-handled models ranging anywhere from 6 to 8 feet long, which would give the fisherman a long reach from shore and be able to remain out of the fish's line of sight. Typically the handle or more properly the shaft, the *ipua*, was fashioned from a freshly cut willow or spruce, stripped of its bark and carefully worked with a knife blade to a diameter of between 1 ½ to 2 inches, so that it fit comfortably in the hand and gave a good grip. It was common practice to attach a short rawhide or rope lanyard, with a loop, to the butt of the shaft so that if a person lost his grip, the loop around his wrist prevented the gaff from being lost.

Again in the experience of Elijah Kakinya, the hook, or *aki*, was often made from the handle of a metal pail or any other stiff wire of at least ¼ inch diameter and up to 2 feet in length. After filing one end to a sharp point, it was bent back to form a U-shaped hook, with a minor outward recurve toward the tip. The bend would be perhaps 3 inches in length, with a gap of perhaps 2 inches across at the bottom of the U, spreading to about 2 ½ inches at the point. The shank or main shaft of the gaff now measured about 18 inches long, with the last 3 or 4 inches to serve as the tang or *manḡuq* by which the it would be attached to the wooden *ipu* handle.

The attachment or hafting of the hook to the shaft could be accomplished in any number of ways, depending upon the preference of the maker and the tools or materials available to him at the time. One method, particularly effective with freshly cut green willow, was to use a piece of fire-heated wire to burn out a 3 or 4 inch deep recess in the dark, punky heartwood at the core of the willow, into which the tang end of the metal shaft was tightly fitted. Then it was lashed tightly in place with rawhide line. Apparently green willow is known to shrink a little as it dries, so that the hafting recess gripped the metal even tighter as time went on.

A second method of hafting was to carve a shallow 3 or 4 inch long groove in the underside of the wooden shaft, into which the metal tang would be laid and again tightly lashed in place. The key to assuring a secure hafting here was to bore a small hole into

the upper end of the hafting groove to accommodate a sharpened end of the tang bent upward to fit in that hole.

However the actual hafting was accomplished, once complete the gaff was a very effective implement within the limits of its use. The basic strategy was to choose your fishing locality carefully, where fish tended to school or bunch up and swim relatively close to the surface. After placing the hook in the water, one kept still and waited patiently until a fish came close enough that the hook could be quickly jerked to impale the fish. As this elder once remarked to his grandson, who he taught how to make and use a gaff, “once the fish comes close enough, he is yours!” (Roosevelt Paneak, pers. comm. 1984).

Sound (*Qukiq*)

Qukiq, the use of sticks or rocks to stun fish under the ice with sound or percussion waves, represents one of the most ingenious and sophisticated methods that the Nunamiut employ to take fish. According to one elder, this works best on ling cod or *tittaalik*, which have a preference for basking in areas of shallow water, like backwater sloughs or shallow pools in slow-moving rivers. Once a fisherman spots his fish through relatively thin ice and water not much more than a foot deep, he will use a large rock or heavy wooden club to strike a sharp blow to the ice right above the fish. Apparently the shock or sound waves produced by the blow will temporarily stun the fish, giving the person time to chop through the ice and pull out his catch. Interestingly, this same elder said that many years ago, when he was a young man, he once saw a group of grayling thickly schooled in shallow water along a lakeshore. As an experiment, using the practice of *qukiq* as his guide, he aimed his .22 rifle at the spot where the fish were and bounced a round off the surface of the water. Much to his surprise and delight a couple of the fish were stunned by the impact and he had himself a tasty lunch of spit-roasted grayling (Justus Mekiana, pers. comm. 1987).

Rocks

Rock fishing, sometimes known as *imai!aqsiaq* or *imaiḡuranun mi!uqtuq*, is largely the pursuit of young adolescent and preadolescent boys who like to play in the water. It customarily takes place in the early autumn as temperatures cool, water flow decreases, and water levels drop, especially in mountain fed headwaters streams. In these localities, such as Contact Creek at the summit of Anaktuvuk Pass, the creek beds are rocky and relatively shallow but tend to contain numerous deeper pools where grayling like to congregate. While most grayling take the decreasing water levels as the cue to retreat back downstream to areas of deeper and more water, there are always those that inadvertently become trapped in pools and shallows and are blocked from retreating to

safer waters. At this point the fish become easy targets for boys armed with rocks who proceed to slaughter any fish in sight and take them home for dinner.

Falling Water Levels (*Imaiguurrat*)

Another circumstance in which fish were sometimes taken by the Nunamiut is, like the forgoing rock method, closely tied to falling autumn water levels. Called here *imaiguurat* or literally “dried ...” for lack of a better name, this involved people taking advantage of a fortuitous set of circumstances caused by fish becoming stranded by falling water levels.

To date we have recorded two locations, (and there may well be a number of others of which we are unaware) each with its own unique circumstances. One location is at the very headwaters creeks of the Kuupaaḡruk River, which head in a number of small lakes on high ground defining the northern face of the Atigun Gorge, just east of Galbraith Lake. The second locality is in the Arctic foothills, several miles north of the range front along a slough of the middle to lower Killik River. No precise location for this site has yet been plotted.

In the Kuupaaḡruk drainage, grayling occasionally get stranded in the creek beds as freeze up proceeds and the water levels fall. As one elder described it:

They go up while the river is high in the spring ... and when the water gets low, most of the water on the river flows under the ground of rocks in a lot of the Kuupaaḡruk. When you find where the puddles were, where the fish were and dried up, they are real noisy when you step on the skins of the graylings” (Arctic John Etalook, pers. comm. 1981).

The Killik situation involves a side channel or slough of the river where the bottom of the side channel is slightly higher than that of the riverbed. Thus in summer when the river is at full flow, the side channel too is fully flooded and occupied by fish. But as the river levels begin to recede in autumn the side channel becomes isolated and the fish are unable to escape. Eventually the remaining slough waters will freeze over, sealing in the fish and protecting them from predators like foxes, wolverines, and the like. There they wait in deep freeze until people come along and harvest them (Justus Mekiana, pers. comm. 1992).

Bow and Arrow Fishing

Also part of the Nunamiut fishing arsenal was the use of bows and specially tipped barbed arrows, at least according to Simon Paneak, who is the only source for this assertion. (See Paneak, n.d.) Clearly, it is the least well known and least well described of any of the traditional fishing methods reportedly practiced among these people, and beyond the indication that they once used this method and an accompanying drawing of a fish arrow (Figure 64), very little is directly known about it.

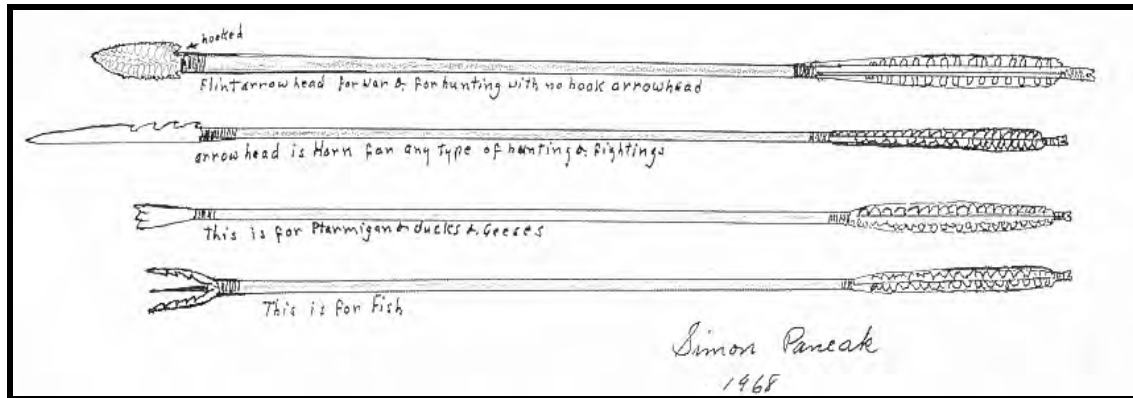


Figure 64

Drawing of a fish arrow (bottom) by Simon Paneak.
Drawing courtesy and copyright John Martin Campbell.

Even when taking Paneak at his well-regarded word, one must speculate that most likely it was neither a very common nor a particularly effective method of fishing, except under some very specialized circumstances. A reasonable assumption might be that it was either the realm of old men no longer able to be active hunters but who could draw upon their inherent skill with a bow and arrow to contribute to the food supply, or it served as a training activity for young boys, who while not yet of an age to be able to contribute much to the family table, could at least practice their stalking and marksmanship, and maybe, with a little luck and skill, even catch something.

Again, speculating in the absence of any concrete details, the most likely optimal setting would have been in open, shallow, and constricted waters, like a lake outlet or narrow stream where fish might be more likely to bunch up or school and are swimming near the surface, and by virtue of their close quarters and proximity to one another would tend to be distracted somewhat from approaching danger. These are hardly a common set of circumstances.

Overall, however, even though arrow fishing would have been practical and perhaps even productive under such circumstances, the fact remains that there were other, far more effective methods available to people, such as nets or traps, which they could have used instead that would likely have yielded greater numbers of fish for less effort and saved themselves the time and effort of making and repairing such specialized arrows and arrowheads in the first place.

Associated Tools and Implements

Having examined the basic methods and technologies used to catch the fish, it also needs to be said that often they could not have been as effectively employed without the artful use of an array of allied tools and implements. These can range from something as simple as a scoop to remove ice from a hole to complex items like nets, traps, and boats.

Perhaps two of the most vital of all fishing related tools, especially among a people who are masters of the winter environment of snow and ice that makes up their world for more than half the year, are the *tuuq* and *ilaun*.

Ice Chisel (Tuug)

The *tuuq* or ice chisel was used to chip holes through lake, creek, and river ice in order to set nets and lush hooks, wield a fish spear, or to jig a fish lure up and down. The *ilaun* or ice dipper was used to clear ice chips and slush from the freshly chipped hole (Figure 64).

The *tuuq* is clearly a tool with a long history that has undergone a number of changes over the centuries, from an ivory or antler tipped pole to an all-metal implement with a broad chisel-like cutting edge. In traditional times, before the introduction and availability of metal or steel, a typical *tuuq* consisted of a wooden pole tipped with a wedge or chisel cutting blade made of antler or ivory, or (perhaps?) even a grizzly bear forearm bone, although these implements would vary to some degree in length, form, and material used, depending on the available materials and the personal tastes of the maker.

In the absence of any extant examples from the Nunamiut, the following description is based in equal parts upon comments from elders, photos from elsewhere on the North Slope, and a bit of informed speculation.



Figure 65

A fisherman armed with his *tuuq* and *ilaun*.

Photo courtesy and copyright Denver Museum of Natural History.

The shaft, or *ipu*, was probably fashioned from spruce wood or sometimes birch, because of their strength, durability, and heft. Typically a pole might measure 6 to 8 feet long and average between 1 and 2 inches in diameter for most of its length. This was a size that fit comfortably in a person's mittened hand and was long enough to penetrate even the thickest of ice covering rivers and lakes of the area. Towards the bottom of the shaft it gradually and gracefully flared, or more properly bulged to a diameter of perhaps 4 or 5 inches before once again narrowing down a bit at its basal end where the cutting blade, or *tuuq* proper, was hafted.

This flaring served two key purposes. On the one hand it made a convenient and ample working surface to haft the cutting blade, while at the same time the additional mass and

weight brought greater force to bear upon the ice and delivered a more powerful blow, increasing the efficiency of the chipping head.

Typically, the workmanship on the *tuuq* would have exhibited the great care and skill that men inherently brought to, and sometimes lavished upon, all their tools and implements, but especially those they used in securing food. The woodwork on the handle alone would have impressed any contemporary craftsman. Through the careful and painstaking use of the *millik* or crooked knife, it would be given a fine surface fluting of closely spaced parallel facets that ran from the full length of the shaft. This fluting, called *amugiitkutaq*, served both to smooth the wood surface to give it a pleasing and refined appearance and to give the fisherman a firm and slip-resistant grip.

As to the actual cutting blade of the traditional *tuuq* and the manner of its hafting, relatively little has been recorded. We do know that the blades were often made from antler or ivory and had an angled chisel-shaped cutting face at the end of the blade. Beyond this nothing can be said.

Interestingly, Paneak's annotated drawing of traditional tools in Figure 66 (originally plate 41 in Campbell 1998) indicates that the forearm bone of the grizzly bear could also be used to tip a *tuuq*. This raises the intriguing possibility, though never explicitly stated by him or any source, that the heavy-duty bear spear or *nijiqpak* might well have served double duty as both a bear spear and a *tuuq*. Such a spear, as described below, fills the basic qualities possessed by a dedicated *tuuq*, such as a long shaft that thickens towards the tip, giving it additional mass and force of impact, tipped with a sharp and durable cutting blade. Admittedly this is at best informed speculation, but one might ask why take the time and effort to make two very similar sized large implements, one for primarily summer use (the *nijiqpak*) and one for primarily winter use (the *tuuq*) when one implement could conceivably serve both purposes, requiring only the periodic replacement of the blade or chipping head. On the other hand, Larsen's 1950 field notes do state that according to his sources a *tuuq* used for chopping holes in the ice had about a 1.5 meter long point of antler, indicating a much smaller implement and seemingly more in line with the example illustrated as item 10 in plate lxvii facing page 175 in Nelson (1899), though not illustrated here.

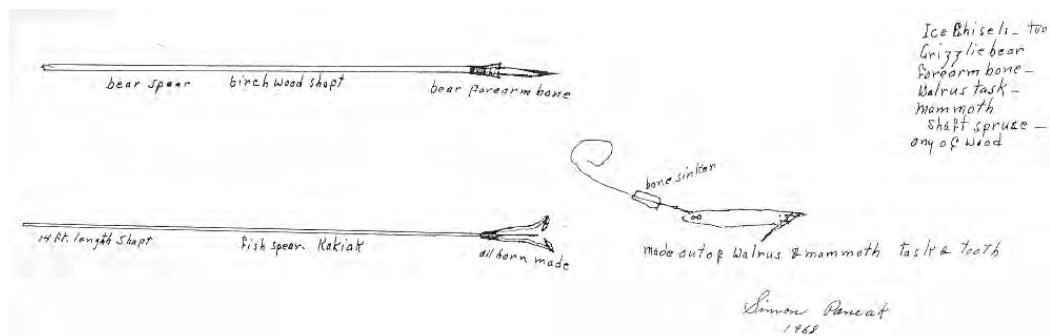


Figure 66
Simon Paneak's drawing of traditional tools, 1968.
Drawing copyright and courtesy John Martin Campbell.



Figure 67

The working end of a bear spear, which may also have served double duty as a *tuuq*.
Photo courtesy and copyright Simon Paneak Memorial Museum.

Although several sources have described such a lance and its use, including Rausch (1951), Ingstad (1954), Gubser (1965), and Paneak (n.d.), only a single full sized specimen of a Nunamiut bear lance is known to exist. It is held in the collections of the University of Alaska Museum and was purchased from its maker, the late Simon Paneak, in 1972.

It is a stout heavy spear, measuring some 8 feet 10 inches from tip to butt. The shaft, or *ipua*, is made from a spruce wood pole over 8 feet long. It is round in cross section, with a maximum diameter near the head, though tapering somewhat to less than 2 inches at the butt.

The shaft has been carefully worked to a finely fluted finish and has been decorated to within inches of its tip with a coating of *ivisaag* stain. The fore-end of the shaft has been heavily modified to accommodate the hafting of the lance point. The underside shows the most work, where, for a distance of 2 inches back from the end, the bottom half of the shaft has been cut away. Near the back of this cut, a deep recess, or *illisi*, has been carved into the shaft to seat the proximal process of the bone point.

A pair of roughly ½ inch wide grooves, or *qiliqruḡvik*, were carved into the remaining half-round portion of the fore-end of the shaft to seat the rawhide lashings used to secure the lance point securely in place.

The point, or *sikua*, measures some 10 ½ inches long and is made from the ulnar bone taken from the forearm of the grizzly. The bone was evidently prepared by first cutting it to length, then splitting it in half lengthwise, leaving the proximal process of the elbow joint intact, then carefully worked to final form.

Viewed from the side, the point resembles a narrow wedge. The top face of the blade is flat, although the underside when viewed head on has a triangular to slightly trapezoidal

cross-section. Viewed from above, the blade portion of the point is roughly parallel sided before it comes to a broad but short angular point. The leading edges of the tip of the blade have each been beveled, one side from the top and the other from the bottom, bringing them both to a chisel-like sharpness.

The actual hafting of the point to the shaft was accomplished by joining the flat top surface of the blade to the flat bottom surface of the shaft and seating the proximal process (the large bump on the end of the bear's forearm) into the prepared recess. They are then tightly bound together with two sets of thick rawhide lashings that encircle the bottom side of the bone point and rest in the grooves carved into the top half of the shaft. These heavy-duty lashings, which the Nunamuit call *nimitqiun* ('the second lashing'), customarily made from the hide of the grizzly bear itself, a material noted for yielding very strong rope. These particular lashings differ from most because they are composed of two layers: the inner set, or *nimiq*, whose strands run lengthwise, and a second outer set, the *nimitqiun* proper, tightly wrapped around the inner strands in a spiral or coiled fashion to form a protective outer sheath. These lashings were applied in a damp or half wet condition called *arruktaaq* to get all of the stretch out of the lines as they were cinched down tightly and to assure that they shrank and grew even tighter as they dried.

In the years following western contact and the widespread availability of metal, people were quick to replace the more fragile ivory, bone, and antler points with this much more durable and easily and keenly sharpened material (Murdoch 1892:307).

By sometime in the 1900s, the classic form of a wooden handled and iron tipped *tuuq* had given way to the all-metal shaft and blade variety. Typically such a *tuuq* was comprised of a rolled steel stock tipped with a thick heavy block-like cutting blade with an easily sharpened single sided chisel-like edge. Such *tuuqs* are still to be found around the community, but since the late 1970s they have largely been eclipsed through the introduction of motorized rotary drills or *niuqtuun*, powered by small two-stroke engines, similar to what would find on an old lawn mower. The motor drives either 6 or 8 inch diameter and 4 foot long drill bits.

There is no denying the convenience, speed and desirability of power augers, but their cost, including extra auger extensions, can be a bit daunting to some, especially those with a limited income. Drilling begins with a single drill section, with the drillers standing on either side of the motor, holding the wing-like handles and applying downward pressure on the drill. Initially the job is a bit awkward because typically the auger handles will stand as high as the drillers' upper chest or shoulders. Once into the ice they will periodically lift the spinning drill upwards to clear the auger of ice, sending chips flying in all directions, then slip the drill back down the hole and once again apply downward pressure, repeating the process until they have reached the end of the auger and need to add the next extension.

Usually water is struck before they need to add a second extension, and the auger is backed out of the hole, this time powerfully and promiscuously spraying a slurry of ice and water far and wide, much to the amusement of onlookers. Once the drilling team has

bored two or three holes and worked up a bit of a sweat, the drill is handed off to another pair of would-be fishermen who will repeat the process two or three times themselves and then hand the rig off to whomever else wishes to make some holes in the ice.

Ice augers may be owned by a single individual or jointly by two or three people who share in the cost of purchase and maintenance. Whatever the case, the drills are always shared while at the fishing hole and are often loaned out to friends or relatives when the owners themselves are not out fishing.

Ice Dipper (Ilaun)

The *ilaun* was the companion piece to the *tuuq*. It was basically an ice dipper or strainer used to clear a freshly chipped hole of any ice fragments and slush that resulted from the digging. In traditional times the *ilaun* reportedly took either of two forms, one a simple wood or sheep horn ladle and the other a long-handled strainer tipped with a roughly oval wood or horn rim, with an underside web or netting bowl woven of babiche, braided sinew, or more likely stripped baleen.

It is worth noting, however, that Helge Larsen's field notes based upon interviews with Nunamiut elders in both Anaktuvuk and Fairbanks in the spring of 1950 state flatly that "they did not use the net type."

The strainer version is illustrated in detail in Figure 67 below and described by Murdoch (1892:308-309) when he wrote of an example collected in Barrow:

The rim of the bowl is a long thin strip of antler bent round into a pointed oval, 8 ½ inches long and 5 ¾ wide, with the ends of the strip overlapping about 3 inches at the broader end. The ends are sewed together with two vertical stitches of whale-bone. ... Round the lower edge of the rim runs a row of twenty seven pairs of small holes 0.2 inch from the edge. The holes of each pair are connected by a deep channel, and a narrow shallow groove, probably for ornament, joins the pair. Through these holes is laced a piece of seal skin thong ... making twenty five loops on the inside of the rim into which the netting is fashioned. This is made of thin strips of whale-bone, interwoven, over and under each other ... making a network of elongated hexagonal arpetures. In short, a net.

(Murdoch's reference to whale bone is in reference to baleen, known at that time as whalebone, not actual bone as we know it.)

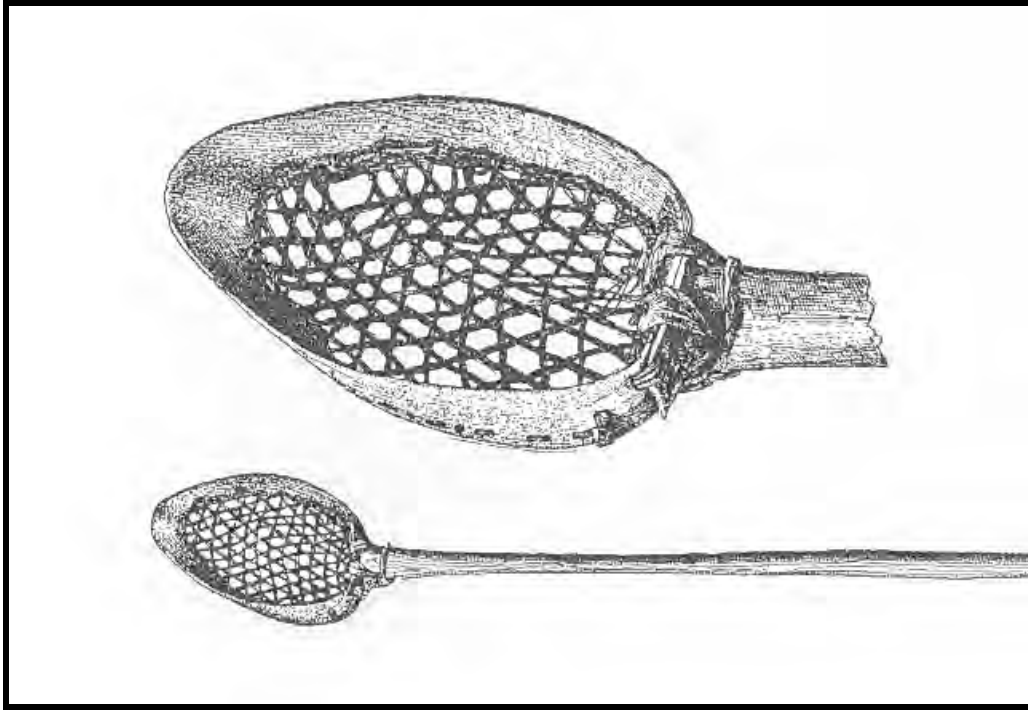


Figure 68
The basket style of *ilaun* as illustrated in Murdoch.
Drawing courtesy and copyright Smithsonian Institution.

The ladle variety of *ilaun* was customarily fashioned from the horn of an adult male Dall sheep, a material that when patiently and skillfully worked to form yielded a graceful, translucent, amber-colored dipper with a deep, broadly rounded bowl and a long upward-curving handle. Their primary use was as a household cooking implement known as a *qayuuttag*, used to ladle out soup and meat, and in the making of *puiñiq* or grease rendered from the crushed marrow bones of caribou, sheep, and other large animals. Their production involved a long careful process of cutting, thinning, and trimming way part of the horn's hollow base to form a pair of wing-like projections, then repeatedly boiling it for hours at a time to soften the horn to the point where the winglike projections could be worked down over a rounded wooden mold, effectively turning the horn inside out and reversing its curve. Several hours' more work of carving, thinning, and smoothing were then required to bring it to its final form (Figure 69).



Figure 69

A sheep horn ladle that could serve double duty as an *ilaun*.
Photo courtesy and copyright Simon Paneak Memorial Museum.

In more recent times people have abandoned these traditional forms for the convenience and durability of either home or commercially made metal ones. The only illustration of a handmade strainer is Figure 69. It was noted at the site of Tirragruaq, a well-known camping and fishing site along the Colville River delta, and at which we examined the remains of houses and ice cellars dating back to the early 1940s and occupied by Nunamiut families who returned inland about that time.

This rusty and well-worn dipper (Figure 70), made by Matthew Eriklook, an old Nunamiut, consisted of a perforated metal bowl attached to a wooden handle that is now largely broken off. The strainer or bowl portion of the dipper appears to have been handcrafted from a section cut from a five-gallon gas can that was cut and folded or bent into a roughly, though not evenly, circular shape. With a maximum diameter of perhaps 12 inches from front to back and perhaps 10 inches side to side, it is quite shallow, probably not more than 2 or 3 inches deep, and is perforated by nine squarish holes that were likely made by the end of a pick axe.



Figure 70

An improvised metal ice scoop from the 1930s or early 1940s.

Photo courtesy and copyright Grant Spearman.

The handle, or *ipu*, a piece of wood about 1 ½ inches wide by perhaps 1 inch thick, was attached to the bowl by metal wire run through holes drilled through the wood and metal bowl. About 6 inches of the handle still survives attached to the interior of the bowl, but its original length is uncertain. However, given the size of the bowl and its potential ice load, it would most likely have had a several-foot-long handle.

Nowadays, some of the more impromptu minded people simply reach into their kitchen drawer and take along their long handled spoon with its large, shallow and slotted bowl, customarily used for draining and serving up foods from broth, or even a regular long-handled ladle. Others prefer using a store-bought strainer, which consists of a shallowly dished disk heavily perforated with small diameter holes, to which a metal handle, usually about 1/2 inch wide and 1/8 inch thick, has been riveted. Customarily the upper end of the handle is curved back a short distance so that it can be conveniently hung in storage when not in use.

Gill Net Set (Il̥laqtuun)

The *il̥laqtuun* was an implement used by the Nunamiut to help set gill nets beneath lake and river ice. In its simplest form, it consisted of a long wooden pole, perhaps 8 or 10 feet in length and 1 to 1 ½ inches in diameter, tipped with a hook at one end. As typical of all Nunamiut implements, the shaft would have been carefully crafted and nicely finished with

the characteristic fine fluting described earlier. Depending upon the taste of the maker, all or part of the shaft may or may not have been colored with the application of *ivisaag*.

The actual hook or *aki*, its size, material, and exact method of hafting varied from individual to individual, but as an example, one man described his grandfather's *ilaqtuun* from the 1930s. The hook was made from the bole of a multistemmed willow tree, where the various stalks grew out of the common underground root bole. After selecting what looked to be the best pair of stalks, this natural V-shaped hook was cut from the bole, with one projection cut shorter than the other then grafted and tied onto the end of the *ilaqtuun* pole.

Driving Sticks and Flails

Driving sticks and flails were traditionally used to herd or drive fish toward either fish nets or fish traps set up to intercept them. These drives were referred to as both *ujuuraq* or *yalhaqtuuq* and could be done both summer and winter, either by an individual or a group of people, depending upon the particular circumstances.

In a drawing done by the late Simon Paneak (see Figure 62) a winter drive is being conducted along a river by some 15 individuals who have gone to a great deal of effort to set the drive up. As is evident, two separate gill nets were set up under the ice, spanning much of the river, a few feet up and downstream from one another. Several rows of holes roughly the width of each net were chiseled through the ice to permit people to both plunge their driving sticks into the holes to scare the fish and to monitor their progress under the ice.

According to the caption in the picture, the customary practice was to first drive the fish downstream toward the first net by a combination of beating upon the ice and tipping their poles through the ice holes, and to then repeat the process with a second drive, pushing the fish back upstream from the opposite direction and into the second net. Although this drawing shows the drive being conducted with two nets, it could just as easily be done with one.

Drives were also done in summer, usually by a lone fisherman who, after setting up his wooden fish trap or *taluyaq* and associated weir in a small creek, would then start walking downstream, splashing with his feet and flailing the water with willow branches to scare the fish into his trap.

Watercraft Used in Fishing Activities

Although much of their fishing was, for lack of a better term, shore based, either from lake shores, river or creek banks, or even atop solid ice, boats were also a vital part of Nunamiut fishing activities.

In traditional times people built and used three different styles of boats, all of which were used either to travel to a fishing locality or most commonly to set and check gill and seine nets. The two best known boat types are the *umiaq* and the *qayaq*; less well known is the *umiaqhauraq*.

Freight Boat (Umiaq)

The *umiaq* was by far the largest of the three. Built light but strong, with an intricately fitted together spruce wood frame and covered with the skins of the bearded seal, these graceful and seaworthy open skin boats could reach lengths of 30 feet with a beam of 5 feet, and could carry a load of several thousand pounds. It was primarily a freighting boat, used by the Nunamiut to transport people and goods to and from coastal trade fairs each summer.

Kayak (Qayaq)

The *qayaq*, in contrast, was essentially a long, narrow, decked-over one-man canoe. With a light flexible spruce and willow wood frame covered with the skins of caribou, these craft were swift, highly maneuverable, but sometimes tricky to handle.

Traditionally, they filled a number of roles, from fishing and waterfowling to the hunting of caribou by men wielding spears in pursuit of herds driven into lakes and rivers.

Unlike the larger *umiaq*, which was relegated for river travel far beyond the mountains and stored at base camp locations in the foothills, the lightweight and highly maneuverable *qayaq* was equally at home there as well as on the rivers and lakes of the Brooks Range.

Open Skin Boat (Umiaqhiuraq)

The *umiaqhiuraq* was a small, quickly and easily built open skin boat that bore at least a superficial resemblance to the larger *umiaq*. The very essence and virtue of the *umiaqhiuraq* was that it could be very quickly improvised from materials readily at hand. The willow framework could be completed in a matter of hours and covered with a prepared set of skins, or skins fresh from the hunt. If necessary the boat could be used once and simply abandoned without having made a large investment in either time or

materials, yet when well made it was durable enough to stand up to extensive use throughout an entire summer season. A common size range for one of these boats was usually between 8 and 12 feet in length and 3 to 4 feet wide.



Figure 71

A rare picture of an *umiaqhuraq*, barely visible behind the rowboat.

Photo courtesy and copyright Raymond Paneak.

Like both the *qayaq* and *umiaq*, the *umiaqhiuraq* was used to set and tend fish nets and occasionally used to spear fish in shallow waters.

By the early years of the 20th century, coastal dwelling Nunamiut began to gain access to wooden boats, initially the small shallow draft sail equipped whaleboats used in whaling activities, some home made rowboats (Figure 71). By the 1930s, some particularly successful trappers had come into possession of larger wooden boats, known as *umiuraq*, some approaching 30 feet in length and outfitted with an inboard engine. These larger boats were most commonly used up and down the lower Colville River and delta area, as well as in coastal traffic from Barrow to Barter Island.



Figure 72

A rowboat left behind at Tirragruaq by Wilbur Itchuagaq (Itchoak) when he moved inland with the Nunamiut sometime around 1940.

Photo courtesy and copyright Grant Spearman.

Following their return inland in the mid to late 1930s, these larger boats were no longer practical in the mountains and foothills, so people returned to making the *umiaqhiuraq* and, upon occasion, *qayaq*.

VII. PRESERVATION AND PREPARATION OF FISH

In their role as a food resource, fish were valued primarily for their flesh, to a lesser extent their roe, and minimally for their fat. They could be prepared and eaten in any number of different ways, including as *pivsi* (dried), *quaq* (frozen), *auruq* (aged, usually underground), *quaqłak* (half frozen), *argiq* (roasted over an open fire), and *uuruq* (boiled or as a soup). How particular fish were prepared depended upon a number of factors including personal preference, the time of year (*quaq* being impractical in summer), and to some degree the type of fish itself.

For example, in summer, large fish like the whitefish, arctic char, and lake trout better lend themselves to being split and air dried on a rack than do small fish like grayling or old man fish, yet grayling are ideal for spitting and roasting over an open fire at any time of year, and like old man fish are small and easily eaten as *quaq* in winter. That said, virtually any kind of fish can be prepared in virtually any manner that a person desires.

Air Dried (*Pivsi*)

Air-dried fish, was, in its day, among the most common and practical ways to process and store fish during the summer months. Depending upon who one speaks with, it is a practice known by either of two names. Most people refer to it as *pivsi*, which is specific to dried fish, while some also call it *panniqtaq*, which they maintain is a general term referring to both dried meat and fish. Whatever the case, it was also one of the most labor intensive, for in addition to the basic necessities of gathering the materials for and constructing drying racks, there followed the actual cutting, hanging, and drying of the fish, which in turn required kindling and tending insect-repelling smudge fires and regular and close inspection of the hanging fish to remove any eggs or insect larvae that the smudges did not prevent from being laid.

Among the most common species of fish to be air-dried were lake trout, arctic char, Dolly Varden, and several species of whitefish. Whitefish in particular were an especially important resource in the difficult days surrounding the turn of the 19th to the 20th century when caribou were scarce, and as Amsden notes:

In summer whitefish were caught at over 70% of the camps; this was clearly the major species in this season and summer was the time at which most whitefish were taken (1977:185).

Drying racks, known as both *iññisaq* and *iññihautaq*, could take a number of forms depending upon the circumstances and the available resources. In most instances the racks were fashioned from locally cut willow poles, although when people were out in the foothills or coastal plain, where the taller, tree-like species of willow are scarce or grow not at all, it was not unheard of for them to anticipate the need and to carry willow and sometimes even spruce poles downriver with them to build their racks.

Customarily these racks took a tripod and cross-pole form, the most basic of which consisted of a pair of willow tripods spanned by a single stout willow pole. The thick butt ends of the tripods were often, though not always, sharpened to a point to facilitate jamming into the ground for stability. The upper, thinner end of each tripod pole invariably terminated in a broad Y-shaped fork where a good-sized branch split off from the trunk, which allowed both the crosspole to nest in the Y and the three tripod poles to be intertwined.

Depending upon the circumstances, tripod and pole racks might consist of linear arrangements of a single pole between two tripods, two poles between three tripods or even in a triangular arrangement of three poles nesting in three tripods.

Generally, racks stood roughly 6 feet tall, sufficiently elevated to give some protection against four-legged foragers like loose dogs, but not high enough to make the hanging of the fish inconvenient (Figure 73).



Figure 73

Typical tall drying racks at a camp along the lower Colville River.

Photo courtesy and copyright by U.S. Geological Survey.

If tall willow was not immediately available, equally serviceable small racks could be improvised with whatever smaller willows were at hand (Figure 74).



Figure 74
Improvised willow drying racks in the Chandler Valley.
Photo courtesy and copyright by Roosevelt Paneak.

The actual cutting up of the fish began with a pair of cuts made down either side of the middle of the back, to just short of the tail to make a pair of roughly inch-to-half-inch-wide linked strips, not unlike the backstrap of a caribou. The flesh here, in one woman's words, "is very fatty and greasy", and when hung to dry these strips produced a very rich and flavorful cut of fish. Once the head is cut off, the strips come free from the fish (Rhoda Ahgook pers. comm. 2004). The rest of the fish was then slit down the belly, gutted, and filleted. Then, from head to tail, horizontal cuts spaced about an inch apart were made from side to side across the inside face of the fish to more thoroughly open up the flesh to the air and thereby speed the drying process.

The drying process began by hanging the tail end of the flayed fish carcass over the cross pole with the two flesh sides initially facing outward to the sun and weather. As the drying progressed over the course of several days, the fish were periodically turned over to allow equal exposure to the sun and air and assure uniform drying on the inner and outer faces.

How long the fish were hung to dry depended to some degree upon the weather and the personal taste of the processor. Among the Nunamiut at least, there was no great enthusiasm for the practice of some other peoples of their acquaintance, to dry some of their fish to a hard, board-like consistency. Rather, they preferred their dried fish soft and juicy. In fact, the Nunamiut distinguished between two varieties or degrees of drying. The moistest variety, which consisted of little more than a slight glazing of the outer layer of

the flesh, was known as *agiparaq*, while the somewhat drier variety, known as *panaagruktaq*, is definitely dry on the outside but still moist in the inside.

Of course, the weather could play utter havoc with the drying process, particularly in a wet, rainy summer where much of a family's catch could be damaged by mold or by having much of the flavor and nutrients leached from the flesh. Today, drying fish can readily be protected by throwing a plastic tarp over the rack, and in earlier times families did much the same thing, by first turning the fish over on the rack so that the flesh side was facing inward and the skin side facing out, after which caribou skins or later, canvas tarps were thrown over the rack full of fish.

Unlike many other Alaska Native peoples, the Nunamiut did not smoke their fish either for flavor or preservation; however, smudge fires called *puyuqun* were built near the racks so that the smoke, carried by the wind, would discourage, if not always repel, blowflies or other insect pests from the still-moist flesh. The smudge fires were usually small hearth-like affairs, with low-burning fires covered by moss or heather to produce a smoky cloud. They required near-constant tending to keep them burning and producing smoke. According to one woman, her family would build a fire with dry willow wood, get it burning hot, then cover the fire with larger thicker sections of freshly cut green willow, over which a thick layer of branches and green leaves were piled. This was guaranteed to burn slowly and produce a thick smoke plume to deter insects (Rhoda Ahgook pers. comm. 2004).

Once the fish were dried to the desired degree, they were removed from the hanging racks and stored on elevated platform racks called *ikkiggaq*, carefully covered with willows and then skins or tarps to protect the flesh from either direct sunlight or from moisture, mold, or mildew. Ideally the fish should not be stacked up upon itself as this makes it easy to rot, so layers of fish were alternated with layers of small-diameter willow branches, which kept the flesh from touching and also allowed air to circulate between the layers of fish. In the event that the stored fish became wet they would be removed from the storage rack, rehung to dry, and then once again replaced upon the platform rack in the manner described above.

If the weather becomes hot, as it can still do in August, the fish must be uncovered, otherwise it can begin to spoil in a process or condition known as *puvlaq*. This was described as even when the fish is dry on the outside the moist inner flesh can ferment and start to form bubbles, "like sourdough and get smelly."

Frozen (*Quaq*)

Quaq is a general term for frozen food and applies equally to both meat and fish. Among the smaller species of fish such as the old man fish, grayling, or any other small fish with scales, the most common method of eating the fish was to first cut away the head, then

make vertical cuts down the length of the back and belly, then to peel away the scaly skin from the sides and then start eating it like a carrot, from top to bottom, bones, innards, and all. Those without scales were not so skinned, and often the smallest fish, those roughly 6 inches or less, were eaten whole, without removing the head. In more than one person's opinion, it is said that the fish tastes better with the bones than without them, and they actually enjoyed eating the bones—back in the day when they were young and still had teeth, as one woman joked.

Larger fish such as the broad whitefish, lake trout, and the like are initially brought into the house to thaw slightly before processing. First, the head is carefully removed to avoid cutting into the liver, or *tiṇuk*, that contains a greenish fluid that can impart a bad flavor to the fish if it is spilled. The fish is then cut up with the woman's knife or *ulu* from head to tail into thick slices. The number and thickness of the slices depends upon the number of hungry mouths to be fed, but as a general rule, people preferred slices at least an inch or two thick. Once the consumer has this frozen fish steak land upon his or her platter, it is first sliced down the middle, from backbone to belly, and then cut up into smaller bite-sized pieces with his or her own knife.

Here again the bones, or at least the smaller to medium-sized vertebrae, were chewed and eaten but the ribs were not. Apparently parents always cautioned their children to chew these bones very well before swallowing, otherwise, they were warned, they would get constipated. When available, enjoyment of the fish was further enhanced by dipping it in *uqsruq*, seal oil, but it was just as readily consumed without, in which case, as Diamond Jenness observed during his stay with a Nunamiut family in the winter of 1913–14, “hunger provides the sauce” (1959:65).

According to one woman, in her experience, the practice of partially thawing the fish before cutting it up with an *ulu* knife dates back to the days before the availability of saws. Once saws began to be used there was no need for any thawing, and the fish could quickly and easily be portioned out no matter if they were frozen rock solid (Rhoda Ahgook pers. comm. 2004).

Half Frozen (*Qauḷak*)

Qaulaq, or “half-frozen fish” for lack of a better term, tended to be more of a treat than a staple part of the diet like *quaq*. In contemporary times, *qualaq* is made from frozen fish brought into the house and placed near a heat source where it is allowed to partially thaw. It is carefully watched, periodically turned, and never allowed to thaw completely, or as one woman stated “not really frozen, not really thaw—you can tell by feeling, is easy to eat, easy to cut.” The resulting texture of the flesh is described as “seems like the frozen with little bit crystals between the meat, that's *qualaq*” (Rachel Riley pers. comm. 2004).

In times past, *qualaq* was also enjoyed in summer by retrieving a frozen fish from an ice cellar, then putting it in a shallow covered *nunataq* pit and allowing it to slowly thaw to the right texture.

In the fall, before the onset of true winter and frigid cold, freshly caught fish would be put into a *nunataq* pit, one dug down to permafrost, and allowed to chill and partially freeze from the underlying frozen ground. Afterwards it was then retrieved and consumed.

According to one senior elder there is a locality, a sand bar, along the east shore of western or *nechelik* channel of the Colville River where travelers bound for the annual trade fair at Nigliq would stop to camp and fish, which takes its name from this treat. Here people would spend time hunting ducks, and setting gill nets for *pikuktuut*, *iqalusaat*, and *anaakliq*, the big whitefish, but when they start catching the big whitefish, that is the sign that it is time to move the few miles farther north to set up camp at Nigliq and await the arrival of the traders from Barrow.

Fermented (*Auruq*)

Auruq, the preparation of aged or fermented fish, could be accomplished in two ways. In traditional times the most common method was to excavate a shallow aging pit or *nunataq* into the ground, lining it with willow or moss, laying in the fish, applying a topping layer of willow or moss, and then covering the pit again with soil, sod, or a caribou skin tarp. The fish were then allowed to age for days or weeks, depending upon one's taste for such things.

In more recent times Nunamiut women have taken to putting fish in a shallow pan filled with water and keeping it in a cool place inside the house for a day or two. The fish is judged to be ready by pinching the flesh. When it is the preferred softness or consistency it will be removed from the water and consumed. Women say that care needs to be exercised when aging as one does not want the flesh to *puvlaq*, to bubble up, as this indicates that it has spoiled and is not fit to eat.

Boiled (*Uruliuk*)

Uruliuk, or boiling, was perhaps the most common method of cooking in a home or camp setting, and yielded not only cooked meat or in this case fish, but also a flavorful broth. After the introduction of Western trade goods in the mid to late 19th century, *uruliuk* was usually done in a large metal pot, or *utkusik*, suspended over an open fire by a large metal or wooden tripod called a *napautat*. However, in the days before metal, water was

brought to a boil by a practice called *qaummaqsiaq*. Fist-sized rocks were heated in an open fire, then transferred to a water-filled container made of either wood or baked clay. There the rocks gave off their heat, boiling and cooking the fish in the process.

Roasting (*Argiq*)

Argiq, the roasting of fish over an open fire, was a popular method of cooking, particularly among hunters and fishermen in the field. It could be done at virtually any time of year with virtually any species of fish but was most common in the summer with relatively small fish such as the grayling or the old man fish.

The simplest and most direct method was to build a fire, sharpen a willow stick, and spit the fish whole by running the stick down the throat from head to tail. The spit was either held over the fire by hand or by jamming the butt end of the stick in the ground at an appropriate angle so that the fish leaned into the flames. Another way of summer roasting was to build a base fire of dry willow wood, top it with larger section of green willow, lay the fish top of these, then cover with willow branches and leaves. This reportedly gives a nice smoky, willowy flavor to the fish.

Storage

While the initial harvesting of the fish was of utmost importance, the successful preservation and storage of the catch was of equal concern. It did a family no good to labor mightily to bring in and process in large numbers of fish only to lose them to predators or spoilage. Thus the Nunamiut employed a number of both warm and cold weather methods of storing and preserving their catch.

Warm Weather

The most obvious method of warm weather preservation was simply air-drying, as described earlier. According to elders, air-dried fish, or *pivsi*, required quite a bit of attention to avoid spoilage. Once the fish had been dried to the preferred consistency it was stored on platform storage racks as described earlier.

A second method was the use of underground storage. This could take two basic forms. The first was the *nunataqaġvik*, a relatively shallow pit excavated to keep the fish cool, and the second was the larger and deeper ice cellars, known as *siġluaq*, built to keep the fish frozen or at least nearly so.

Nunataq storage pits were generally neither very large nor very deep and were quickly and easily made by excavating down a couple of feet to the summertime permafrost level, then lining the pit with moss or willow branches, adding the fish, and covering the top with the vegetated sod covering originally excavated to make the hole. Generally speaking, such storage pits were intended for relatively temporary or short-to-medium-term storage and generally kept the flesh cool rather than frozen.

Sigluaq, on the other hand, were built specifically for long-term storage, both summer and winter, and to keep the flesh frozen. The largely collapsed remains of such a structure were photographed at the old Colville River winter encampment at Tirragruaq. At the time of the use of this structure the camp was occupied by the Hugo and Iriqluq families, sometime during the 1930s or early 1940s (Figure 75).



Figure 75
Remains of the Hugo and Iriqluq families' *sigluaq* at Tirragruaq.
Photo courtesy and copyright Grant Spearman.

Cold Weather

One of the prime advantages to winter weather, apart from the ease of travel it allows across the snow and ice covered landscape, is its facility to keep food frozen and utterly free from spoilage.

Here again people might make use of a *siġluaq*, but only if they took the opportunity to build one during the warm summer months when the ground was at least partially thawed, making excavation a manageable task. After freezeup such a task was scarcely worth the effort, and in this case people cleverly built another style of cold-weather cache known as the *sikutchigvik*. Simply put, a *sikutchigvik* is an ice walled (and sometimes partially roofed) enclosure in which to keep meat and fish. One such structure was described by Jenness as follows: “The Eskimos who are living here made an ice box to keep fish in. It is a cube, with a face about 5 feet (high enough to keep the dogs out) made from four blocks of ice about 2 inches thick, without top or bottom” (Jenness 1991:58).

VIII. CONTINUITY AND CHANGE IN FISHING PRACTICES AND VALUES THROUGH TIME

In any economy based on hunting and gathering, both short and longer term fluctuations in resource availability and resulting alterations in land use patterns are to be expected. Thus in times of shortages the hunter must adjust his food gathering strategies by either shifting emphasis from a now scarce resource to a relatively more plentiful one, or by entering new areas where resources are more plentiful, or a combination of both. These were the basic options and responses open to the Nunamiut during a period of extreme hardship that struck them in the years surrounding the end of the 19th and the beginning of the 20th centuries.

During this time, the Nunamiut abandoned their traditional territories because of resource shortages, spent a number of years in coastal exile, then later returned inland to reestablish themselves and their traditional way of life before finally becoming involved in a series of events and choices that led them to give up their seminomadic lifestyle and to establish a permanent village at Anaktuvuk Pass. Working within the context of the events that overtook them during these years, researcher Charles W. Amsden made a detailed examination of changes in their settlement dynamics between 1898-1969.

However, before tracing these changes through time, a brief review of what is believed to be a reasonably accurate portrayal of the precontact Nunamiut seasonal round is useful to help show the context from which they derived. The information presented here is an amalgam of general information that also draws heavily upon Campbell's (1968a) article discussing Nunamiut territoriality within the context of the Tulugaḡmiut, a local band that based its activities around Tulugaq Lake at the mouth of the Anaktuvuk Valley. His model of settlement types, while imperfect, has a certain utility and will be employed judiciously here to give context to the general pattern of movements discussed below.

The Nunamiut were a big game hunting society with an economy and a culture based upon the hunting of caribou. Their society was structured around the localized, family based, territorial band. Even at their peak population, around the time of contact, they were never numerous, and are estimated to have numbered no more than perhaps 1,400 individuals. (Gubser 1965, Campbell 1968a). These bands, as characterized by Campbell (1968a:3-4), "consisted of four or more nuclear or extended families. Band membership was by preference, and although an individual might remain for life a member of the band into which he was born, he or she would commonly at some point join another band for a period of months, or years or permanently."

Each band was possessed of its own home territory, the core of which was customarily one or more of the larger river valley systems and its tributaries that cut the north face of

the range. They often took their name or identity from this river. The Nunamiut response to the nature and demands of this environment was to develop a seminomadic lifestyle. It was a life of great mobility, marked by the freedom and capability to move swiftly and sometimes far in pursuit of game or other resources. As a result, Campbell (1968a:4) estimates that in the course of a year, or perhaps several years, a band might make use of an area of 3,000 to 5,000 square miles, which “encompassed the geographical space necessary to provide each band with food, fuel and clothing.” But, he goes on to add, “Because of the peculiar nature of these requirements, portions of a band’s territorial border often overlapped those of one or more neighboring bands. In many such cases, the common ground was frequently used and amicably shared.”

Each band had its own clearly acknowledged leader, or headman, but his role and effectiveness was a direct reflection of his personal abilities as both a hunter and a finder of game, as well as being a knowledgeable man of sound and tempered judgment. Generally, such a man rose to this position by earning the trust and respect of his fellow band members and maintaining it by exercising his influence “only by friendly persuasion, or most commonly, by being followed and imitated ... and in the long run, political authority depended upon the man’s having both the extraordinary attributes that have been noted and the continuing good will of his band mates” (1968a:4).

This, in very condensed form, represents the social and political aspects of Nunamiut society. Within their territories they ordered their lives around the flow of the seasons, which governed not only the availability of food and other resources but quite therefore where they lived and camped.

Not unlike the caribou, upon which their economy and way of life was based, the Nunamiut themselves followed a regular pattern of seasonal movements that employed a sophisticated set of subsistence strategies representing their particular, and quite successful, adaptation to the environment and resources of these arctic mountains and their foothills.

Within each band’s territory, people seasonally occupied a sort of headquarters locale where they seasonally came together for several months of the year to pursue key subsistence and social activities, usually centered upon the fall and spring caribou migration hunts.

Often these headquarter localities were associated with large range-front lakes, such as Tulugaq Lake for the Tulugaqmiut of the Anaktuvuk Valley, Narvakvak or Chandler Lake for the Nadvaqvakmiut (also known as the Iñiqagligmiut for their main camping locality, Iñiqaglig Creek), Itqiliq Lake for the Itqiligmuit (more properly known as the Ulumiut, for the Ulu Valley in which Itkillik Lake lies), and so on.

Twice each year, during the annual spring and fall caribou migrations, groups of Nunamiut families converged at certain key locations to establish corporate hunting parties. Their goal was to harvest as much meat, fat, and marrow as possible to last them through the relatively lean months of summer and winter, times when caribou are

dispersed and often absent entirely from the mountains. Skins were harvested for use in clothing, shelter, rope, and trade, with tendons and ligaments processed into thread, while the bones and antlers provided the raw materials for making a variety of tools and implements.

Following the spring hunt, the assembled families made plans for the coming summer. Some would elect to remain in the mountains for the season while others made preparations to attend the summer trade fair at Nigliq on the Colville River delta. Those who set out for the coast traveled first by sled until they reached their boat cache site in the northern foothills on or near the upper to middle Colville. Here the previous spring they had cached their large *umiaq* freight boats for the winter. Now they readied their boats and awaited breakup before setting out downriver the rest of the way to Nigliq.

There for a week or two they would join friends and relatives from other mountain valleys to trade with their partners, the coastal Iñupiat from Barrow and neighboring areas. The inlanders brought with them a wide array of resources from the mountains, foothills, and forests to the south, including caribou skins and the pelts of wolves, wolverines, foxes, lynx, marten, and others. They also brought spruce wood, alder wood, and birch wood, both as raw materials and in the form of finished products. Also among their offerings were mineral resources such as flint, slate, pyrites for starting fires, and iron oxide mineral dyes.

In return, they sought to obtain marine and sea mammal products from their coastal partners, including the highly prized and invaluable seal skin pokes filled with nutritious and life-sustaining oils rendered from the fat of whales, seals, and walrus. Seal skin clothing, especially waterproof boots, was always in demand as were raw skins of seal and walrus as well as tough, durable ropes and lines made from them. Walrus ivory, whale bone, and whale baleen were also very popular as were any number of coastal delicacies to eat like whale, seal, and walrus blubber along with aged and fermented fish. There was always something for everyone's tastes and needs.

During the time people spent along the Colville River delta immediately preceding and following the Trade Fair, a great deal of time and effort was spent fishing, as families set out their nets to harvest the runs of whitefish to enjoy fresh from the river and to dry to take back upriver with them.

At the end of the trade fair, most Nunamiut families returned upriver to their boat cache sites, and it was not uncommon for them to also cache their supply of dried fish there as emergency stores against a hard winter with little or no food back in the mountains. Once at the cache sites, they would again become actively engaged in fishing and plant gathering while putting their primary effort into hunting late summer and early fall caribou, both for their fat-rich meat and their skins, prime for making clothing as well as for trade at the next year's fair. Usually by mid to late October the rivers had frozen over and enough snow had fallen to set out by sled back to the mountains. There they would meet up with their counterparts who had remained behind for the summer.

Those who had stayed inland for the summer often split up into small family groups who were widely dispersed and frequently on the move in search of game. With the caribou herds far to the north at their calving grounds and out of convenient hunting range, it sometimes made sense, late in the summer, for people to set up a base camp at a large range-front lake to fish, and from there to range widely in pursuit of game, including ground squirrels, marmots, Dall sheep, the occasional grizzly bear, and generally whatever they could find wherever they could find it. Lakeside camps also made sense because as small herds of caribou wandered into the area, as they almost always did, they could easily be driven into the lake and speared by men in *qayyat*.

Inland summer fishing activities would likely have included jigging in swift-moving creeks for grayling; setting wicker traps and associated weirs in creeks and lake outlets for a variety of fish, particularly grayling and old man fish; stalking pike in lake shallows with fish spears, and setting gill nets at lake outlets to take lake trout, arctic char, or other sizeable fish.

Generally, caribou hunting prospects began looking up in late summer as the animals moved southward from their calving grounds and into the foothills, thus drawing closer to the mountains where they could more easily be pursued. Throughout August and September and perhaps into early October, the initially small and widely scattered groups of caribou began to coalesce into larger herds until finally the animals embarked upon their southward migration. Numbering in the thousands and sometimes tens of thousands, often strung out for miles in long lines, herds of caribou led by older cows file through the northern tundra valleys of the Brooks Range on their way to their overwintering grounds deep within the shelter of the northern boreal forest.

By then, if the traveling and trail conditions allowed, the families who had gone north to trade for the summer were back in the mountains, reunited with friends and families and ready for the fall hunt. This was the time of year everyone looked forward to, with men, women, and children all working together to drive the herds of animals into large impound corrals where they became entangled in snares and were easily taken in large numbers.

In a year with a successful fall hunt, with plentiful stores of seal oil, caribou meat, skins, and tallow, or herds of caribou overwintering nearby, families could focus most of their attention upon the trapping of fur-bearing animals and the accumulation of pelts for trade, rather than on the search for food alone.

Under these circumstances, small groups of one or two related families would often move off to settle at any one of a number of favored overwintering locales. These were places where large stands of willow offered shelter from the wind, fuel for cooking and heating, and construction materials for housing, as well as being located close to reliable fishing locales, recognized sheep range, and when practical, overwintering caribou.

From there the men could trap to bring in the valuable pelts of wolves, wolverines, foxes, lynx, and other small but lucrative animal skins for use in clothing and in trade. Fishing

activities at this kind of camp might have included hook and line jigging through the ice for grayling, lake trout, and any resident arctic char as well as setting lush hooks for ling cod.

Alternatively, in a poor year, characterized by a low-yield fall hunt, limited meat and fat reserves, and/or few if any overwintering caribou, families would frequently be forced to keep on the move. Living in their portable caribou skin *itchalik* tents, they were constantly searching for game, relocating as often as necessary, leaving very little time for trapping.

Depending upon their particular circumstances, a family might first fall back on hunting Dall sheep in an attempt to make up for the shortfall in caribou. Failing this, they would almost certainly retreat to a reliable fishing locality where open water or thin ice permitted easy access to overwintering fish.

However, even in a good year, by early spring most food stocks were at a low ebb and people were frequently biding their time, eagerly waiting for the spring migration, while subsisting on fish, ptarmigan, and ground squirrels. Keeping a close eye on the phases of the moon and knowing it was time for the herds to come again, the widely scattered families began to gather once more at their favorite hunting camp and prepare in earnest for the herds. . Fishing activities would have largely involved jigging through the ice for lake trout and grayling, setting lush hooks for ling, setting gill nets for whatever they could catch.

This represents the customary seasonal round and subsistence cycle of the precontact Nunamiut, as best as can be determined. Against this pattern we can view Amsden's work. One of the most interesting and perhaps instructive aspects is how Nunamiut fishing practices have changed over time, often in response to stress in either the social or physical environment. In times of plenty and a steady resource base, the how, when, and where of fishing activities was largely at the discretion of the fisherman, fitting it into the overall scheme of his seasonal settlement and subsistence pattern. In times of resource shortages, however, the locations and availability (or not) of accessing fishing resources actually became a driving force behind the radical restructuring of the settlement and subsistence pattern so that, in effect, fish could actually determine people's movements and where they focused their subsistence efforts.

Amsden documented some interesting trends and shifts in the overall role and importance of fishing in the Nunamiut food quest as well as the relative importance or use of specific species through time. In general terms—accepting Campbell's and Gubser's assertions that fish played a minor role in both the early contact (circa 1875) and contemporary periods (circa 1960)—he found that “fish were relatively important during the rest of the century” (Amsden 1978:180). Broadly speaking, in the early years of the 20th century, in the midst of the worst that period had to offer, people were often located along rivers in the foothills or the coastal plain, and fishing was intensively pursued with whitefish being the predominant species taken (Amsden 1978:184). In subsequent years, as conditions improved and people were more readily able to re-exploit parts of their former range

farther inland, “whitefish appear to have been de-emphasized and lake trout, char and especially grayling became increasingly important” (Amsden 1978:185). This represented a shift from mainly riverine species to mainly lake species that resulted from people’s shift from a coastal and coastal plain, where riverine species predominate, back to the montane headwater setting, most suitable for other species.

Other key trends he noted included the fact that the use of fish, in general, decreased over time. During the first decade of the 20th century, fish were taken at some 60% of camps, while between roughly 1910 to 1950 it had fallen to only about 30% and over the next decade decreased further to only about 20%. This reflects the fact that caribou were becoming more plentiful and the need for reliance upon fish was consequently decreasing. Interestingly, Amsden also was able to discern that throughout these crucial decades of change, people nevertheless hewed closely to an enduring seasonal pattern of fishing that was most active in the summer and fall and less so in the winter and spring (1978:181).

Below we will take a more specific look at these trends in relation to historic events and shifts in land use practices. Amsden has traced these changes through a series of "periods," which he feels correspond well to documented historic events. These periods have been summarized here, along with encapsulated contextual summaries of the historic events that propelled them into being. Of particular interest here are how these events and the changes they put into play were reflected in people’s fishing practices. When appropriate, illustrative oral history passages have been included to help highlight these events and trends in more personal and immediate terms.

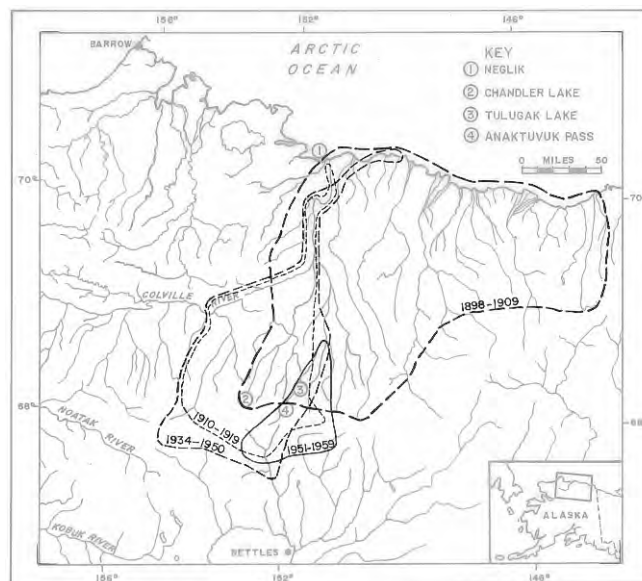


Figure 76

Composite of Amsden’s map of movements of the Nunamiut, 1898 to 1959.

Period 1 (1898 to 1909)

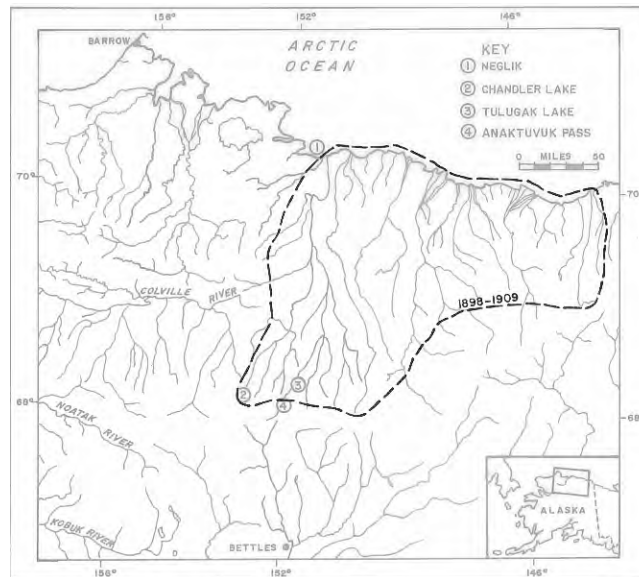


Figure 77
Nunamiut territories of habitation: 1898 to 1909.

During this decade, which Amsden has designated as the first period, the Nunamiut suffered a staggering and tragic reduction in their numbers by an unprecedented combination of starvation, disease, and emigration. The starvation resulted from a precipitate decline in the Western Arctic caribou herd, their primary food resource. Hard on its heels came a series of flu and measles epidemics, introduced through contact with commercial whalers, that repeatedly swept inland over the course of several years, killing large numbers of people. Then, as a result of widespread death and disruption of their social structure, there began a dramatic population shift northward to the arctic coast and eastward into Canada, to access the still plentiful Porcupine caribou herds as well jobs and trade goods from the whaling ships that regularly overwintered in coastal waters.

The heyday of the whaling years came to an end in 1907, with the total collapse of the price of baleen. In its place arose the arctic fur trapping industry, based upon the trapping of the white furred arctic fox. Over the next quarter century, this industry and the network of trading posts it spawned effectively replaced the whaling fleet as a source of trade goods and income and therefore played a very important and pivotal role in the lives of the Nunamiut people.

Turning from these historical events to their impacts upon Nunamiut land use patterns and practices and fishing activities in particular, we see that as a direct result of the broad-based northward and eastward movement of people, the use the forest zone along the southern edge of the Brooks Range ceased altogether, but that the remaining zones from the coast to the mountains remained in use, with the largest proportion of sites occurring in the foothills (Amsden 1977:81). According to Amsden, winters were now

spent either in the mountains hunting sheep or ice fishing along major rivers on the coastal plain. Spring was spent in the foothills or on the plain, and after breakup the Nunamiut would travel down to the coast to spend the summer fishing and trading. Fall saw a return inland to the foothills to await freeze-up, and then back either to the mountains or the coastal plain for winter. This pattern was established to take advantage of food resources and game that might, under normal circumstances, have been of only secondary importance. During this period fish were especially important, though mountain sheep, ptarmigan, and ground squirrels were also vital food sources. Amsden points out that “Between 1898 and 1909 fish were taken at more than 60% of the camps in that period—over twice the number in which either caribou or sheep were killed” (1977:181). There was also a high degree of mobility and great distances between camps, because the scarce resources were rapidly depleted at any one location.

The seasonal pattern Amsden was able to discern was that “during nearly every summer and fall ... the major activity involved the catching and drying of fish for use in the coming months, and supplies of fish were often cached at various locations for use as emergency rations” (1977:182). Interestingly, it appears that whitefish were the most important species, followed in turn by grayling, sheefish, and ling cod (184). This importance of whitefish is in part because so many of their camping localities were on rivers, a marked departure from their traditional patterns. Over 80% of the occupations in each season were in river or river-creek outlet settings, (295), because these places were ideal for taking whitefish and because caribou were scarce.

This mobility in the face of limited resources, as well as people’s dependence upon fish, is especially well illustrated by the experiences of an elder who recalled, in his early youth, a very difficult winter spent in the foothills. It was passed moving from camp to camp, subsisting primarily on fish, fishing at any locality until they could catch no more, and then moving on. After a number of moves from their starting point along the Itqiliq River, they finally arrived at a fishing hole known as Qalugauraq or “the little fish” along the Anaktuvuk River:

We would go upriver into the Anaqtuuvak on foot and at the end of the place where it doesn’t completely freeze through, we would hook for *anmaqut* and make our living in this way.... After a while we began to experience hunger, and the fish became difficult to hook. They learned that we were in that area. That is the way fish are when people stay close. They became out of reach to us. (Arctic John Etalook pers. comm. 1981)

It was time again to move on and hope that the next fishing hole they came to would not have already been fished out by somebody else, or better yet, that they would find some caribou and that conditions would improve. Sometimes people were lucky, as this vignette indicates:

My grandparents Nuusillaq and Qaliṇak stayed put there, trying to live, trying to survive.... My grandfather Nusillaq became weak as he was trying to hook fish. My grandmother tried to keep him alive.... Whenever

she would set out to go on the river up there at Iñiguraq, she would pray that she might be given something, wanting to live. After she prayed she put her hook in and sometimes she would hook something, whether it be whitefish or *paiqtuq* or *aṇmaḡuuraq*, and they barely survived. (Arctic John Etalook pers. comm. 1981)

Unfortunately this was not always the case, as this brief account from Kakinya shows.

Then there was Utuaḡuuraq's father Akamak who would hook for fish and his wife would trap. While fishing one day he caught a fish and he was so happy he started jumping around and lost his fish in through another fishing hole. That fish was to save his life and he died also of starvation. (Elijah Kakinya n.d.)

Clearly, life inland during this period could be an extremely precarious proposition. Caribou were incredibly scarce, if they were to be found at all, sheep populations were quickly depleted, and the fall-back resources of fish and ptarmigan were, at best, just barely enough to get through a hard, cold winter. In many ways life was made even more challenging for these who remained inland because of the loss of so many friends and relatives and the sense of isolation and loneliness that inevitably results. Thus the seductive draw of people and resources in coastal areas was a powerful incentive to give up this isolated existence and to seek out a more secure future there.

Period 2 (1910 to 1919)

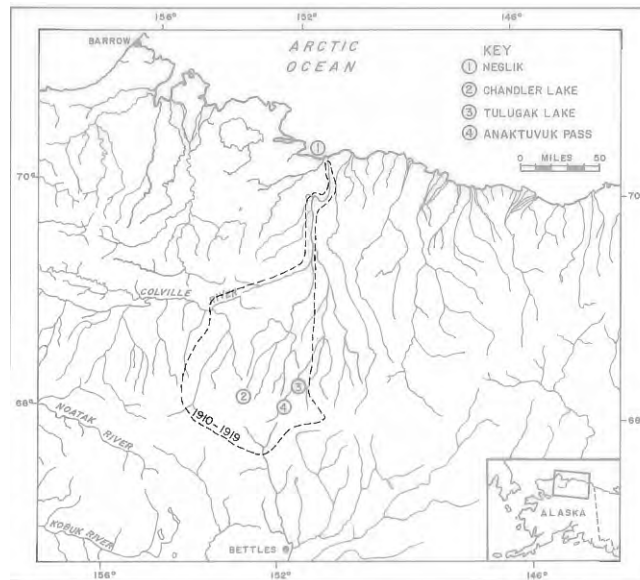


Figure 78
Nunamiut territories of habitation: 1910 to 1919.

During Amsden's second period, the exodus from inland areas continued in the wake of ongoing food shortages, the proliferation of coastal fur trading posts, and the rise of mission schools in villages such as Barrow and Point Hope—all very powerful draws for a people as socially oriented as the Iñupiat (Amsden 1977, Burch 1975).

Ironically, as people continued to abandon the interior during this period, the caribou herds were just beginning, around 1910, to slowly rebound (Burch 1972:358). As the human population continued to decrease, so did the hunting pressure on a number of other animals like Dall sheep, marmots, fish, hares, and ptarmigan, as well as fur-bearing predators like wolves, wolverines, and foxes, which also had a chance to rebuild their numbers. Thus overall there was a slight improvement in the subsistence base for those people who were still living inland.

Nevertheless, despite the slowly improving conditions, the depopulation of the interior continued. From what had been a peak estimated precontact population of perhaps 1,400 people, by the early years of the 20th century the number of people who spent at least a part of the year inland had been reduced to perhaps 200 (Amsden 1977:290). The end result was that by 1920 the Nunamiut had effectively abandoned their home range. This process was a long one, however, having begun in the late 1890s, and those individuals who did remain inland the longest benefited by the fact that by now the worst was over.

Again, turning to the impacts upon the Nunamiuts' land use and subsistence patterns that resulted from these trends, the depopulation continued, and among those remaining inland there was a southwestward shift and further shrinking of habitation areas.

Subsistence activities showed an increased emphasis on caribou, fur-bearing animals, and trade goods, and overall, a decreased emphasis on fishing. Use of the coastal plain areas diminished as year-round use of the mountains and foothills increased. Even the forest zone south of the continental divide saw limited use again (Amsden 1977:81).

Amsden goes on to say that “fish were still taken at most camps in summer and fall (in fact more camps in both seasons than either caribou or sheep) but they were not exploited as intensively as in previous years and they were virtually unexploited in winter and spring” (1977:301) This shift in exploitation of fish seems to go hand in hand with the increased use of areas farther inland in the mountain zone and a “corresponding shift away from a riverine orientation ... and an increasing emphasis ... on locating camps along smaller creeks, especially in winter and spring, and lake situations were used to a greater extent” (303). Interestingly, this trend is quite the opposite of those who made their way to the coast, as we shall see.

Although Amsden makes no concrete statements about shifts in the exploitation from species to species, it would not be out of line to assume there was a shift in the species used, generally away from the heavy reliance upon the more riverine based whitefish species to increasing reliance upon fish more common to inland lakes and streams like arctic char, lake trout, grayling, old man fish, ling cod, and the like.

Despite these generally improving conditions inland, the coast remained extremely attractive to those few families who still held out. In the end, even they were finally drawn there to join their kinsmen, for relief from isolation, for access to the growing arctic fur trapping industry, and for the ready availability of trade goods. As Diamond Jenness observed, while living among a small group of expatriate Nunamiut along the coast over the winter of 1913-1914, a good season of trapping could outfit a man “not only with all the necessities for the coming year, but a number of luxuries beside” (1957:42-43).

Among the expatriate Nunamiut families Jenness writes about was that of Aqsiataaq, with whom he lived for several months over the winter of 1913-1914 at the camp at Saktui on the western shore of Harrison Bay (Iglu 1 on the following map). There, while Aqsiataaq and his eldest son Etalook actively pursued the trapping of arctic fox and other furbearers, this and other Nunamiut families sustained themselves with a combination of Western trade foods and whitefish.

As Jenness noted, following his first meal with his hosts “these Eskimos gave us of their very best unstintingly. They are living themselves very largely on fish (caught with nets at a lake some distance away) and on ptarmigan, which the man shoots” (1991:15). Jenness went on to add that Aqsiataaq’s oldest son was on his way to Barrow by boat to secure Western foods.

Every few days, members of the family, often including Jenness, who they referred to as “Gennessi,” set off for a freshwater lake some 15 miles distant from their camp to net whitefish. “We loaded the sleds immediately after breakfast, and left at 9:50 a.m. for the

fishing lake [Teshekpuk Lake], only a short distance away, the lady of the house assured us. We found it to be about 15 miles away by the trail we followed, but that of course might be quite near for an Eskimo.... A little before 3:00 p.m. we came out upon the lagoon, and crossing a corner of it arrived at two houses, or rather tents—our final destination”(Jenness 1991:50-51).

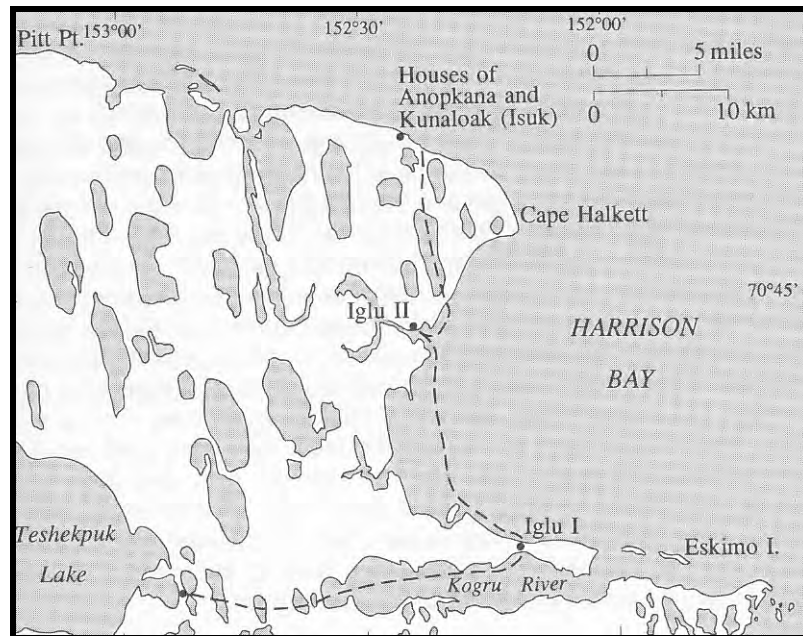


Figure 79

Map of Aqsiataaq's camp (Iglu 1) in relation to other camps and the fishing locality discussed below. Map from Jenness 1991.

Of particular interest here is Jenness' observation on the quantities of fish caught by the man Alak (Aqsiataaq's brother in law): "He took up his three nets, securing 93 fish (one day's catch) and let our people put their nets in their place, thus saving them the trouble of making holes in the ice and of running lines along for stretching out the nets" (1991:52)

The object of their piscatorial ambitions was described by Jenness thus: "The fish they are catching in the lake here are commonly known among the Europeans as 'white fish.' They average from 12 to 18 inches, have two pectoral, two ventral and an anal fin, a dorsal and a small second dorsal. On the back they are dark, almost black, but at the side this yields to a pale mauve tinged with pink, and underneath they are a creamy green. The back forms an arch ending in front at the pointed nose and behind in the bifid tail. The iris of the eyes is yellow" (1991:53). This appears to be a reasonably good description of the broad whitefish (*Coregonus nasus*).

In an interesting sidelight, and in contrast to the vast majority of their contemporaries, a very small cluster of Nunamiut families who had already moved coastward several years before began to establish their own unique pattern of summering on the arctic coast and then spending the winters far to the south,

across the continental divide into Indian country in the area of Arctic Village and elsewhere.

Nevertheless, by 1920 the Brooks Range had effectively been abandoned by the Nunamiut and would remain that way for another 14 or 15 years.

Period 3: The Interim Years (1920 to 1934)

This interim period of abandonment of the north-central Brooks Range is characterized by Amsden as an “interlude” in Nunamiut habitation of interior northern Alaska. He also cautions that these dates represent only a *minimum* span of abandonment, since the exodus from inland areas actually began, for some families, in the latter 19th century. By 1920, however, the Nunamiut had thoroughly dispersed throughout arctic Alaska.

A fairly common pattern for many coastal-based Nunamiut families was to have a sod house built along or near the coast from which they tended their traplines during winter. Come spring it was not uncommon for people to head out to the barrier islands to seal, hunt polar bear and, in some instances, even to whale. Then, before the ice became rotten, people would retreat to the mainland and relocate to productive fishing localities and to hunt whatever caribou might be in the area before returning to their houses in fall, to prepare for another winter of trapping. During winter the arctic fox, a coastal animal, was intensively trapped there, although some traplines penetrated inland, sometimes up the Colville River and its tributaries, far into the foothills, the mountains, and even across the continental divide.

Unfortunately, Amsden lacks any definitive data on species use, but again one would anticipate a strong emphasis upon anadromous riverine species such as whitefish, augmented with some more locally resident species as ling cod, grayling, some arctic char, and perhaps the occasional lake trout.

Families who overwintered in the Colville River delta area customarily chose localities where they could not only secure plenty of fish like the cisco and whitefish making their run upriver immediately before, during, and after, freeze up but also where they could be reasonably certain of securing overwintering populations of lingcod and grayling and easily access nearby lakes where additional stocks of whitefish were to be found.

While this sometimes required shifts between fall and any number of winter camp locations, depending upon how much meat and fish was available at any particular location, it was not always so. Among the favored and generally more productive localities immediately above the head of the delta were Tirraġruaq, Kayuqtusilik, Itkiliqpaat. Other favored winter camps further upriver towards Ocean Point and above included Kuugauraq, Qikiqtaġruuraq, and Isuuraq. There

were of course many others, but these locations seem to have been especially favored by elders who could remain comfortably camped in a sod house with plenty of firewood and well fed while their younger relatives could be gone for days if not weeks at a time, ranging far and wide in search of caribou and moose and trapping furbearers far upriver and deep into the interior, as Arctic John Etalook recalls.

My parents stayed at Kayuqtusiḷuk for quite a few winters ... must have been about four winters. It's about that many. But in the winter Kattairuaq and I went upriver to trap. At that time my parents were the only ones who spent the winter at Kayqtusiḷik, after we built a sod house first for them.... We [Kattairuaq and Etalook] went to Tulugaq the first winter, all the way down to the trees. (Arctic John Etalook, pers. comm. 1981)

At the end of the trapping season, people headed to the coast, sometimes to Beechey Point or to the offshore barrier islands where they spent their time sealing and polar bear hunting on the sea ice. Summers were spent fishing, sometimes along the coast but more often in camps scattered up and down the delta and lower Colville. Again favored summer fishing localities included Nigliq, Tirraḡruaq, Kayuqtusiḷuk, Tuḡauraq, and Isuuraq, among several others.

Late fall, winter, and early spring were spent hunting and trapping, perhaps with occasional trips inland to the foothills and mountains. While the Nunamiut made their living on and near the coast, some watched patiently as the caribou gradually increased in number and conditions improved inland to the south.

Generally speaking, during these years life was relatively good, but with the onset of the Great Depression and the devastating collapse of the trapping industry, for some families there was little incentive to remain in exile along the coast any longer, and sentiments began to grow to return inland and to reestablish life as it once was.

Period 4 (1934 to 1950)

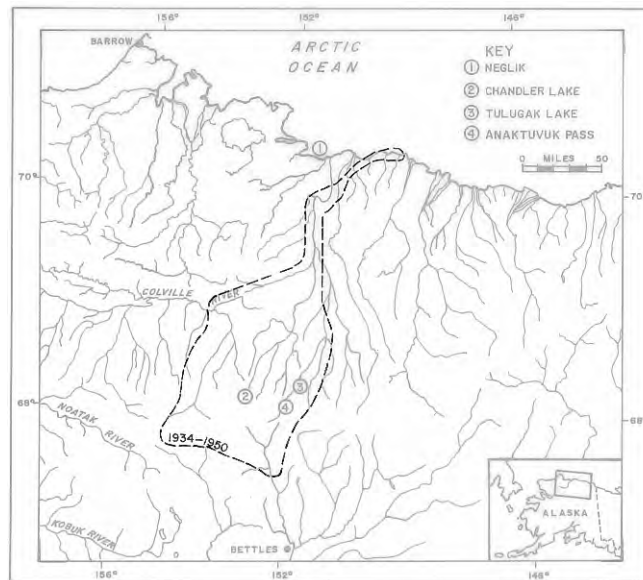


Figure 80
Nunamiut territories of habitation: 1934 to 1949.

The fourth period, a span of nearly 15 years, saw the Nunamiut returning inland, tentatively at first and later wholeheartedly, setting in motion a series of events and choices that ultimately led to establishing and settling into the present day village of Anaktuvuk Pass.

With living conditions deteriorating on the coast, a number of families began staying for most of the year in the mountains and foothills, returning to the coast for summer trading. The resettlement process was spearheaded by a small number of Nunamiut families who had relocated to the Colville River delta area because it offered a fairly stable subsistence base and easy access to the still operational trading posts at Kayuktusiuk and Beechey Point. They yearned to return inland, and as one researcher aptly wrote, “the year 1934 marked the beginning of a journey back into the mountains for at least four Iñupiat families. The first steps were tentative, as they kept within relatively easy reach of the sea and its resources that had supported them for more than a decade” (Hall et al. 1985:65).

They began by building a small handful of *ivrulich*, willow-framed moss houses, on the north side of the Colville near the confluences of the Anaktuvuk and Chandler rivers. These served as a conveniently positioned base camp from which these families began exploring the possibilities and practicalities of returning inland. It was to here that they would return upriver from the coast at summer’s end to await freeze up before setting off into the foothills and the mountains for the winter. Then they would return again in late spring, either to continue on by sled or to await breakup before heading back downriver to the delta and the coast for the summer (Amsden 1977).

The spring pattern varied somewhat from family to family, depending in large measure on whether they owned a boat or not. One family who lacked a boat would head downriver to the Colville in late April, ahead of breakup, stop briefly at Kayuqtusiġik, then continue to Qulvi along the coast and then on to Mitqutaiġaq, or Amauliktuq or Piġu Island to hunt seals for oil, then head to the Beechey Point area for the latter part of July and early August, then back upriver to Kayuqtusiġik until freezeup and then back inland (Justus Mekiana, pers. comm.). Those with boats would follow much the same pattern but would remain at their foothills base camp until after breakup, then launch their boats and head down river to the delta and then on to the coast (Justus Mekiana, pers. comm.).

Once back inland for the fall and winter season, the families scattered at will, traveling widely from the Killik River drainages on the west to the Anaktuvuk area on the east, moving from camp to camp throughout the mountains and the foothills as they saw fit.

In 1939, these families, joined by one or two others in 1940, committed to returning inland on a permanent basis, thus forming the nucleus of the families making up the present-day population of Anaktuvuk Pass. In so doing, they abandoned the coast and coastal plain and focused their activities on the foothills and mountain areas, as well as beginning to use the forest zone again on a limited basis (Amsden 1977:312). Caribou were by now reestablished as the primary resource, followed in importance by mountain sheep. Fish were still an important food item, but the emphasis shifted from river species to those found in mountain lakes and creeks. There was also an increased harvest of furbearers, with the emphasis on wolves that carried a recently established federal bounty of \$20 apiece, which represented the people's primary source of cash.

In many ways the seasonal pattern they adopted during these years was very similar to that of the precontact period, with the major difference being that after 1941 or 1942, they made fewer coastal trading trips. From that point on they focused their trade activities primarily on Kobuk River trading posts at Shungnak and Ambler and to a lesser extent the Koyukuk River post at Bettles.

Over the course of this decade, most of the resettled families centered their activities around the Killik River valley, its tributaries, and some neighboring drainages such as the Nigu, Alatna, Uqpigruat, and Uqqumilaat valleys. Some people preferred to spend at least part of their time a bit farther afield to the east, moving through areas along the Anaktuvuk and upper John River and their tributaries such as the Hunt Fork. Sometimes they even passed their summers near Chandler and Tulugaq lakes.

Based upon conversations with elders, it appears that they often implemented a strategy of establishing long-term summer base camps along the shores of good sized range-front lakes like Chandler, Tulugaq, Imaġniġpak, and others. This positioned them where they could maintain a steady harvest of lake and nearby river fish, while periodically sending hunters out to hunt for sheep up the valley and patrol north into the foothills for caribou.

Fish harvests depended somewhat upon the locality but customarily included predominantly lake trout and grayling, with some species of whitefish, ling cod, old man fish, the occasional arctic char, and, less welcome, the bony flesh of the pike.

During the winter months, people generally maintained their encampments in the shelter of large willow stands scattered among the mountain valleys. If caribou were plentiful and people anticipated being able to remain in one place for an extended period of time, they might build a moss house, but if resources were scarce they might prefer to use their caribou skin tents, which were ideal for making frequent moves.

While the Tulugaq Lake area offered both a prime winter camping area and a substantial fishery resource, people in this area and farther west went farther afield from their encampments to any number of lakes or areas of open water in rivers and streams to harvest fish.

There were also occasions when families elected to pass most, if not all, of the winter in the foothills, including those who sometimes overwintered and trapped out of Aaqhaaliuraq Lake along the middle Anaktuvuk River, in the vicinity of Rooftop ridge. This appears to have been one of the more productive foothills areas for fish: both the lake and a handful of areas of open water upstream along the Anaktuvuk River from there to the Naniksrak Bluff area have long been known for their fishery resources, grayling primary among them.

Spring may have seen a small increase in foothills fishing and wolf hunting as hunters took advantage of the open country to howl or call wolves into shooting range as they had for generations. After the spring hunt, the foothills saw very little use until late summer when hunters again began hunting both marmots and caribou with prime pelts.

There were of course exceptions to this, and from time to time families elected to remain in the foothills during the summer months to fish, hunt marmots and sheep in the more rugged foothill mountain areas, and to take caribou as available.

Without doubt, the most significant turn of events during these years was the establishment of airborne contact and trade to Fairbanks. Two significant outgrowths of this development were first, that long overland trade expeditions were no longer a necessity, and second, that increasingly some Nunamiut camps were located near good aircraft landing areas. The shift to year-round occupation of inland areas also affected their mobility. The difficulty of overland travel in months when there was no snow cover contributed to the further shrinking of their area of habitation. In the late 1940s, outsiders familiar with the Nunamiut encouraged them to relocate to the Anaktuvuk valley for ease of contact and airborne services. Thus between 1947 and 1949 the promise of a teacher available for the summer months served as a magnet to draw the remaining families together at Tulugaq Lake.

Period 5 (1951 to 1959)

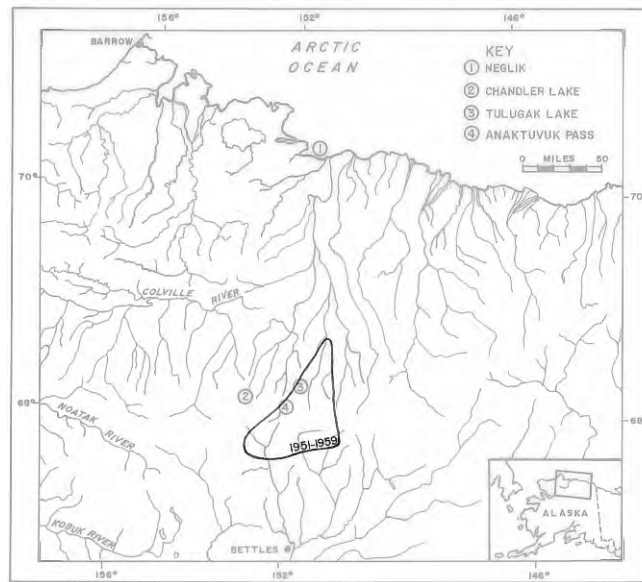


Figure 81
Nunamiut territories of habitation: 1950 to 1959.

The fifth period was, quite arguably, the pivotal decade of transition for the Nunamiut, when they gradually shifted from their highly mobile nomadic lifestyle to an almost completely sedentary one. They began by establishing a base camp at the summit of Anaktuvuk Pass, in association with a recently established post office and a small, summer season trading post, to take advantage of regularly scheduled air service, postal services, and educational opportunities seasonally available from visiting teachers.

As a result, their mobility decreased and their habitation area shifted further southward, diminishing in size and centering closer around the summit base camp. The mountain and forest zones saw much heavier use now, while the foothills were only used for intermittent hunting and trapping forays. This shrinking of territory and decrease in general mobility between camps went hand in hand with an increase in localized occupations in the Anaktuvuk Pass and Tulugaq Lake area, which came into increasing and recurrent use for habitation (Amsden 1977:321). Most of the families, originally from the Killiq, tended to center the activities out of the summit locations, but a small group of two or sometimes three families preferred to remain farther afield at the Tulugaq Lake area and continued to do so until a school was established at the pass, when they relocated and joined the other families already there.

During these years, caribou remained the primary resource, and Dall sheep were secondary until the local population was hunted out. Fish, on the other hand, continued to decline in importance, no longer so vital now with the dependable caribou resource. The hunting of furbearers, however, remained very important (Amsden 1977:323).

Again based on incidental conversations with elders over the past 30 years as well as data from Amsden, it is evident that in the years between 1951 and 1959, people's overland travels as well as fishing activities, while sometimes wide-ranging, were relatively restricted and largely limited northwards to the upper to middle Anaktuvuk River drainage, southwards to the upper North Fork and upper John River drainages, and some of their tributaries and eastwards to the Chandler and Agiaq lakes areas.

The one notable exception to this pattern was the early to midsummer wolf-pupping expeditions mounted by small groups of men on foot and accompanied by pack dogs who scoured the countryside searching for wolf dens from which pups could be harvested and taken for bounty. These trips took men far afield from their Anaktuvuk Pass base camp, at times reaching as far east as the Galbraith Lake and Atigun River area, in the vicinity of the current-day pipeline corridor, and as far west as Kurupa and Cascade lakes, beyond the far side of the Killiq River valley. In the course of these outings, which customarily took the men through the major mountain valleys and sometimes some distance into the northern foothills, they routinely fished in virtually every lake, stream, creek, and river in those areas.

Among the primary fishing localities were all the lakes and tributaries listed earlier in the section of the report characterizing the upper Anaktuvuk and John River valley areas, as well as a handful of fishing holes along the Anaktuvuk River between the Naniksarak bluff and Ahaliorak Lake, an area along Bombardment Creek on the upper North Fork of the Koyukuk, and deep pools on the John River in the vicinity of the Hunt Fork, and the complex of lakes in the Agiaq-Chandler Lake area to the west.

The primary species taken in these settings would have been the grayling, lake trout, char, ling cod, old man fish, and the occasional whitefish and pike. Primary technologies employed would have included jigging, louche hooks, traps, gill and seine nets, and occasionally fish spears and gaff hooks (Roosevelt Paneak pers. comm. 2004).

Period 6 (1960 to 1969)

The sixth period saw the final steps in the formation of the permanent village of Anaktuvuk Pass. One of the most potent forces in the process was the construction, in 1960, of a state funded school facility and the presence of a full-time teaching staff. Full-time village occupation necessitated adjustments and changes in their lifestyle, including new uses for traditional resources and new methods of procurement. Caribou remained the major subsistence food, but their hides were now used in manufacturing masks for sale to outsiders. Dall sheep were taken opportunistically on a limited basis, and fishing now provided only minor variation to the diet. Trapping and wolf hunting remained important, but the furs were more likely to remain in the village for use in clothing and masks rather than being traded out (Amsden 1977:328)

In the preceding decade, wide-ranging hunting trips of long duration were regularly undertaken, but now with the fetters of village life and restraints imposed by schooling the youngsters, such trips became less common. It should be pointed out, however, that the amount of area used did not markedly decrease in size. Beginning in the early to mid 1960s, when snowmachines began to be introduced, it became increasingly practical to cover large distances in much less time than was possible with a dog team (Amsden 1977:329). However, people were not really able to fully exploit their potential until affordable faster and more reliable snowmachines became available in the mid 1970s.

Use of the foothills was much as it had been before, although in the mid to late 1960s the bounty on wolves was rescinded and the early summer wolf-pupping expeditions became a thing of the past.

As stated above, fishing now provided minor variation to the diet. Fishing activities continued to decline, especially as dog teams began to give way to snowmachines and the need to feed large teams of dogs shrank accordingly. Still, seasonal patterns of fishing activities and areas exploited would have differed little in area, species of fish harvested, or technologies used from the preceding period.

Period 7 (1970 to 1979)

I have no data for this period.

Period 8 (1980 to 1990)

The decade of the 1980s found the Nunamiut in a period of unprecedented wealth, as the North Slope Borough's Capital Improvements Program funded the construction of a modern community infrastructure, including a school, fire station, health clinic, heavy equipment shops and warehouses, roads, an improved airstrip, and plentiful modern housing. With wages routinely hovering around \$35 per hour for skilled workers and only slightly less for laborers, the level of disposable income rocketed to unprecedented heights.

Large, powerful snowmachines were used for fall and spring fishing and six- and eight-wheeled all-terrain vehicles became the summer mode of transportation, allowing swift and easy travel to distant overland fishing localities. Chartering aircraft from Umiat or Bettles for summer fishing at distant lakes became increasingly popular, so much so that the village corporation elected to buy their own Cessna 185 on floats and hire a pilot to be stationed in the village for the summer fishing season. Between 1984 and 1986, the plane was in nearly constant use as villagers chartered flights west to Chandler, Little

Chandler, Amitchuuq, Agiaq, and Round lakes; northward to Tulugaq, Natvaksrauq, and Igñivik; and eastward to Shainin and Itkillik lakes.

Following a tragic accident at Chandler Lake in 1986, the community elected to sell the plane, and after this the only airborne fishing activities were those occasionally provided by a man with a small plane who had married into the community. Even these ended with his departure in the early 1990s.

Fishing Today

Contemporary fishing activities are largely in line with those of the 1980s, absent the availability of a locally based plane to transport people to otherwise far-flung fishing localities. Outside charters were so exceptionally rare as to be a non-factor.

Fishing today among the residents of Anaktuvuk Pass represents an amalgam of recreational and subsistence pursuits. There is no clear line of distinction to be drawn between the two, unless one chooses to arbitrarily attempt to discriminate between necessity and desire, and even this line is dangerously indistinct, particularly when trying to somehow differentiate between the physical and the psychological. They are but two sides of the same coin. Clearly, given the array of contemporary foods and food sources, including the village store, a local restaurant, and the like, the pursuit and consumption of fish is scarcely a necessity in the sense that physical deprivation or hardship will follow without them, as was sometimes the case during times of famine in the late 19th and early 20th centuries. Yet from a psychological, spiritual, and cultural perspective, the need for a fresh fish dinner is not to be minimized among a people whose existence has always been drawn directly from the land and its waters, including fish, and who sometimes depended upon fish for survival.

As was highlighted early on, by virtue of historically inhabiting the headwaters of the foothills and valleys of the Brooks Range, people were often beyond the limits of large-scale salmon and whitefish runs and therefore largely drew upon lake and stream species of fish to meet their needs. This translated into limited numbers of species and relatively limited opportunities to access them, again compared to areas with access to large dependable runs of salmon and whitefish.

Today, no less than in the past, fishing remains a year-round pursuit, albeit with seasonal spikes in both activity and harvest. The two seasons of greatest intensity are spring and fall respectively, followed by summer and then winter.

Winter is largely the season of men, of hunters and trappers traversing the often frigid and windswept landscape for caribou and furbearers to feed and clothe their families. Between late November and March, when days are short and temperatures are usually at their lowest, fishing subsides into a lull, with very little activity save for one or two

families who in January might set gill nets in the areas of open water at Tulugaq Lake, some 12 miles north of the village, to catch some *saviġuunnaq*, the round whitefish that depart the lakes for the rivers at this time of year. Alternatively, a passing individual might check the status of fish, and perhaps try their luck at Pailuq, a small, shallow stretch of open water along the uppermost reaches of the Anaktuvuk River several miles northeast of town, or if he were tending his traps in the neighboring upper Koyukuk drainage, a man might check out the pool of open water along the uppermost limit of Bombardment Creek and see if he can catch a few old man fish.

With the onset of spring, characterized by longer hours of daylight and gradually warming temperatures, the pursuit of fishing begins to pick up in numbers of participants, in intensity, and in range across the landscape. It is a time of year that allows women and older children to more fully participate in a wide range of activities, and the long hours of daylight—which by early May scarcely includes three or four hours of dusky darkness—and generally excellent trail conditions give people free rein to travel extensively and far in pursuit of fish.

As long as a viably traveled trail persists, the most popular and frequented spring fishing locality is the Chandler Lake area, some 35 miles southwest of Anaktuvuk. Sometimes referred to as Big Chandler, the largest of the several lakes in the area is the primary focus with a number of favored fishing localities that tend to cluster around the southern half of the lake. Also fished, though not nearly as intensively, is Little Chandler, a somewhat smaller and irregularly shaped lake attached to the north end of Big Chandler by a narrow neck of water. Other lakes sometimes, though not often, visited nearby include Round Lake, just beyond Little Chandler to the north, and Amitchuaq and Agiaq lakes, a few miles south of the big lake.

Other lake fisheries include Tulugaq, at the northern entry to the Anaktuvuk valley; sometimes Maġġaqtuuq directly across the valley to the west of Tulugaq; Natvakruak Lake just four miles north and west of the valley; Shainin Lake, some distance north and primarily east of Anaktuvuk; and rarely Itqiliq Lake, located within a few miles of the Trans-Alaska pipeline corridor.

Another locality that held people's attention over many year was Aaqhaaliuraq, located in the foothills on the west side of the Anaktuvuk River, just opposite Rooftop Ridge. Springtime outings there were still quite common up until the mid 1980s when it was discovered that land otters or some other predator had taken up residence there and virtually cleaned out the fish. Even now in 2004, rarely if ever does anyone make much of an effort to fish there, perhaps because all the fish they need or desire are available closer to home, or maybe because those people of an older generation who had the strongest attachment or associated history with the place are growing older now and the young people for whom Ahaliorak was not an integral part of their experience, lack that same sort of tie.

Favored springtime river and stream localities include Paiqłuk on the upper Anaktuvuk and Ikiappak Creek, a tributary of the upper John River. For those families camping at

treeline in the vicinity of Puvlatuuq, it is just a short 20-mile jaunt downstream to an old and traditionally fished area of open water at the junction of the Hunt Fork with the John River.

Summer is also a busy season, but now fishing is almost exclusively limited to the Anaktuvuk and tributaries of the uppermost John River areas. Summer fishing is almost as much a recreational as it is a subsistence pursuit. By far the vast majority of fishing is done by rod and reel, although there are some individuals who still set a gill net from time to time. The favored netting localities tend to be localized at Tulugaq Lake and Ikiaqpak.

Youngsters are most likely to fish locally on foot, at nearby Eleanor Lake or among the many quiet pools of Contact Creek. Teenagers, especially those with access to all-terrain vehicles, will range further afield, out north to Cache Lake or the Char Hole beyond Kanguumavik Creek. Other localities include Tulugaq Lake, perhaps Natvakruak Lake a few miles northwest of the valley mouth, Igñivik Lake a few miles to the northeast, and upon occasion Shainin Lake.

Other Anaktuvuk valley localities may include Maggaqtuuq Lake, Annivik Lake, and any number of pools along the river up to its head, the favored localities of the upper Anaktuvuk being at the mouth of Ben Creek and at Paiqluk.

To the south, the upper John River offers few fishing localities of any consequence except at Ikiaqpak Creek. Loon Lake, a few miles further was once a relatively good fishing locality, but in recent years changes in the lake's outlet stream led to a considerable drop in water levels and its productivity as well.

Fall is the season of ice fishing. Once the rivers have iced over and a sufficient snow cover has fallen to make snowmachine travel practical, people gear up for the ice-fishing season. It runs roughly from mid October through late November, the shoulder period before winter temperatures and winds remove any practical pleasure or comfort from this pursuit.

The main ice fishing locality is clearly the Chandler Lake area, which becomes something of a weekend mecca for fishing and socializing, as small parties of families, cumulatively numbering in the dozens will distribute themselves up and down the lakeshores, united in their desire to catch as many fat char or lake trout as they can before heading home.

Perhaps the lone innovation during this time period is the inception of a spring ice-fishing tournament that customarily runs from late March through early to mid May or until the trails become impractical for snowmachine travel. The tournament, which is annually sponsored by the City of Anaktuvuk Recreation Department, was initiated back in the mid to late 1990s and is funded in part by entry fees, which in the last year reached heights of \$50 per person.

Despite the lure of prize money, the cost of the 2002 entry fee, while hardly dampening people's enthusiasm for fishing, inevitably led to a markedly diminished participation in the tournament. It is rumored that the fee will be lower next year.

Although the tournament is quite popular with villagers, the National Park Service has some reservations about it, largely because much fishing activity is conducted at lakes within designated park lands, and federal regulations frown upon any sort of fishing activities that might be construed as commercial in nature. The fact that winners receive cash prizes makes them quite uneasy. Nevertheless to date, and to their credit, they have kept their concerns to themselves and have not made any moves to rein in the practice.

IX. SPIRITUALITY AND FISH

Unlike the Tlingit, Haida, Tsimshian, and other tribes of southeast Alaska whose dependence upon the abundant runs of salmon and other fish spawned elaborate spiritual beliefs and ceremonial observations surrounding these creatures, the Nunamiut seem to have possessed only the most modest of fish-related beliefs. Their traditions are largely innocent of much elaboration, a reflection perhaps of the generally subordinate role of fish as a food resource.

In the Nunamiut scheme of things, fish, like all the other wild creatures and beings that made up their natural (and supernatural) world, were viewed as possessing a spiritual or essential life force, which they call its *iñua*. In turn, the collective life force of all fish was embodied in an all-encompassing power wielded by a supernatural being or guardian spirit. This guardian, which possesses its own distinct personality, was referred to as both the *Qaluich Kanjat*, the chief, or literally the “root or source of the fish,” or more simply *Iqaluum Iñua*, the fish spirit.

According to Nunamiut oral tradition, the fish spirit is a long-haired woman whose flowing tresses obscure her face from view. Perpetually dwelling beneath the waters of lakes and rivers, she was likened to a mother of fish; always respected and perhaps even occasionally feared for her power over the availability of fish, alternately withholding or disbursing them for the use of humans. Her inclination to either make fish plentifully available or to capriciously withhold them was seen as a direct response to people’s behavior towards her.

As with all creatures, the demonstration of respect and the observation of correct and appropriate behavior towards its *iñua* or spirit was essential to maintaining a good relationship with that spirit so that its associated creatures could be caught. Part and parcel of this relationship with the *Iqaluum Iñua* was the obligation to abide by a number of key behavioral restrictions to avoid angering her spirit. Judging by the admittedly fragmentary information presently available, it appears that a key concept in these restrictions is the necessity of refraining from activities involving certain other types of subsistence pursuits, including berry picking or working and using products obtained from animals that provided food.

For example, one source reports that “if a woman scraped or sewed caribou skins near a fishing place, the *iñua* of the fish would be angered and a fisherman would have bad luck there” (Gubser 1965:200). Additional insights into these restrictions can be seen in a story entitled “*Qaluich Kanjat*,” which was recorded in Anaktuvuk Pass in 1949, published in 1987, and is here presented in Section X, Fish in Oral Tradition. Apart from this modest metaphysical discourse on the relationship between humans and fish, most of the remainder of the Nunamuit’s oral traditions regarding fish are humorous and mildly instructive or explain the things people see in nature.

X. FISH IN THE ORAL TRADITION

Among the Nunamiut people, the oral transmission of knowledge, reminiscences, and experience is an ancient practice and is one key to their sense of self, cultural identity, and in many ways, their success as inhabitants of the north-central Brooks Range. Within this oral tradition they distinguish between two distinct genres: *unipkaat* and *quliaqtuat*.

Unipqaat are more what westerners might label myths or legends: seemingly fanciful tales of mystical beings and circumstances a bit outside of the experience, though certainly not the enthusiasm, of some more modern-thinking peoples. Yet the Nunamiut have neither need or reason to doubt their validity or veracity, for these are the traditions that have for centuries sustained and guided them. They represent or give expression to their unique interpretation the world they inhabit. They teach, they illuminate, they interpret and give meaning to the mundane as well as the profound and inexplicable. And they are fun to hear.

Quliaqtuat, on the other hand, are tales of personal reminiscences and experiences that inform, amuse, entertain, and sometimes even teach. They are even more fun to hear but are a bit outside of the scope of this report.

In this section we present a number of *unipkaanich*, for much the same purposes for which they were originally told: interpretation, explanation, education, and of course, entertainment. The first story is entitled “The Pike and the Sucker” and was recorded by Nicholas Gubser during his 14-month stay among the Nunamiut in 1960 and 1961 (Gubser 1965:254).

Once in the early days, a pike and a sucker were both traveling on a river in kayaks. They were carrying forked spears shaped like the bones in their bodies. When they met on the river, they immediately fell into an argument and became very angry at each other. The pike accused the sucker of being lazy. The sucker replied that he was not lazy, that he was in very good physical shape, and capable of obtaining his own food and further, that the pike was a poor hunter and was forced to live on bones and rocks. The pike was very proud and they began to fight each other with spears. The sucker was faster and speared the front part of the pike’s kayak. The pike was slower and managed to spear the back part of the sucker’s kayak. That is why we find forked bones in the front part of the pike and forked bones in the back part of the sucker. The sucker won the fight and after that the pike never accused the sucker of being slow or lazy.

This second story, told by Elijah Kakinya, recorded on tape in 1949 by Helge Ingstad and published in 1987, tells a tale about the guardian spirit of the fish and her prohibitions against certain activities, alluded to above, when people are fishing.

This story of theirs happened at Aaqhaaliuraq.

The people of the Colville [River] living down there [ate] the fish of Aaqhaaliuraq, but they did not like blubber, those onetime people. Moving upstream in fall, after picking berries down-stream, those who lived at the Colville [River] and fished in the fall, living on fish and hunting caribou, moved up in fall to that place down there [Aaqhaaliuraq], all those people of the old days.

Then a woman among them arrived at Aaqhaaliuraq with sealskin boot soles oiled with blubber. And when the people had also arrived, one of the women was careless, careless about her behavior, and took berries from the berry bag. From the bag she removed berries, blueberries. And the people who were moving upstream started eating berries when the woman brought food to the community house. One of them had sealskin soles oiled with blubber and a sealskin bag. And that woman also took out berries.

The owner of the fish down there at Aaqhaaliuraq—a person who was like a mother to them, like their source—had a face that was not visible because of her hair. It was impossible to see her face because her face was covered by her hair, for she had too much hair, the one who was like the chief of the fish. She was displeased because using blubber and eating berries were not allowed. Those two women had displeased the long haired one—one of them by serving berries and the other by having her boot-soles oiled with blubber. When they offended her, although the band that was moving upstream was the population of a large village, the long-haired woman had all of them killed by the fish! So our ancestors, when they lived down there, never ate berries nor did they use sealskin soles.

There are other traditions too concerning fish, though perhaps not so closely tied to their spiritual power. One tale often heard among the Nunamiut concerns the existence of a giant fish called Iqualuaqpak, reported to be a huge lake trout. Nunamiut elders indicate that such fish have been seen in a number of the larger lakes that occur among the northern valleys and foothills of the central Brooks Range. Gubser (1965:254) recorded accounts of a giant lake trout inhabiting Chandler Lake that “was said to have been as long as three kayaks, over 50 feet, and capable of swallowing a whole caribou.” Unfortunately this magnificent fish has not been seen in some years, and the largest lake trout recently taken from Chandler, in the spring of 1984, measured in at closer to 50 inches than 50 feet.



Figure 82

Molly Ahgook, center, and her nearly 50-inch lake trout.

Photo courtesy and copyright Molly Ahgook.

Some stories involving fish even have a ribald aspect to them, as illustrated in the following tale entitled “Malguk Aanaluurak” or the “The Two Little Old Ladies,” again recorded in 1949 and published in 1987.

A long time ago, it's said, two little old women were living with a large group of people on the shore of a river. When winter came, the people would leave the two little old women and go hunting; and there were also a group of people living in another village.

They regularly met with the people living in the other village; there were many people in the place where the two little old women lived. When they went to meet the other people, at the time they went hunting, when they met then, they would have a good time, playing all kinds of games, and football, and having footraces. When they had a footrace, the people of the other village used to offer big prizes; if they beat them, they offered them prizes of skins—caribou skins, valuable things. To anyone who beat them, it is said, they had prizes to give. The two little old women's people never beat them when they had a footrace. In their absence, the two little old women passed the winter. In the summertime, when the people stayed with them, the two women used to gather berries and roots. And when winter came, the people went to hunt and at the same time to meet those people living in the other village. This was their custom at that time, those people.

Then, once again, at the time they went hunting, when they went to meet them, although the others offered big prizes to them this time, too, they didn't beat them this time either, when they had a footrace. Having had such bad luck, they

wanted somehow to employ those little old women, who were shamans. So they paid them and made new parkas for the two old women, asking them to make them win. The two old women were very grateful and said they would ask for a victory, when they had a footrace over there again.

When the next winter came, they again went over there to meet those people they used to visit when they went hunting, those they used to go meet. When they met them again over there, and the others arranged a footrace with big prizes, then they beat them in the footrace. When they were beaten, the others got angry because the winners had finally gotten the big prizes they had offered. Then they went home in a happy mood, having won this time. When they got home this time, in spring, they gave the two little old women some of the furs they had won, after having divided up the furs they had won.

Then they spent the whole summer with the two little old women, living on fish, catching them in traps, the way they used to fish in that river. Living at the river with the two little old women, they had no shortage of roots and berries in the summer.

Next winter they again went over there, at the time they were hunting, to meet the people living in the other village. When they met, they again had a very happy time over there. Having a good time there, they played all kinds of games, and they played foot-ball; and when again they arranged a footrace, the other people offered still bigger prizes this time for the winner to take. The two little old women had told them to win once more, to make those they were living with win once more.

Now the people living in the other village also had a little old woman shaman.

When they had a footrace there, they won another victory! Then the people living in that village, the hosts, were extremely angry. They were displeased. After having a good time there, the visitors turned homeward to the two little old women. When they had started homeward in a very happy mood, after they had left, the other villagers paid their little old woman a great deal, giving her skins and all kinds of clothing and asking her to kill them [the winners] while they were away from home, if she could.

The little old woman got very excited about the payment she was going to receive and she took a little willow with a fork in it. Having treated the forked willow with some witchcraft of hers, she placed it on the trail in the direction they had gone. Then the people who were going home in a happy mood got sick on the way, before they reached the two little old women.

When spring finally came, the two little old women expected the men, but they did not show up at all. They could do nothing but wait in vain. They didn't come back to them, although spring came and the river began flowing. When it began to

flow they passed the whole spring, and when it became a good time to catch fish, they began living by fishing with traps. Living like that, having nothing but fish to eat, the two little old women didn't eat any caribou at all, for they had no one to hunt for them.

After some time, one of them began to think, "I wish I could somehow catch game that would provide meat to eat." With this in mind, that little old woman decided to make a spotted seal somehow. Those two little old women each had a fish trap, apart from each other. After thinking it over, she went up above their fish trap, acting as if she were going to gather berries and roots, for gathering berries and roots was the job of the old women at that time.

Back up there, she busied herself gathering some grass, winding and shaping it like a seal, and then she took it to the river. When she had taken it to the river and finished shaping it like a seal, she launched the spotted seal she had made into the water. And when the current was about to take it, she said to the spotted seal she had made, "Become a big, fat spotted seal, and go into my fish trap down there!" With these words she left it.

Then they passed the whole evening, and when they got sleepy, they went to sleep, after eating fish. And afterwards, early in the morning, the little old woman went to check her trap. When she checked it, oh, how wonderful! Down there in her trap was a nice big spotted seal! It was already in the trap, dead. Then the little old woman was very glad, because she had finally made a spotted seal.

Emptying her trap, she took the seal ashore and dragged it home. When she had gotten it home, she cut it up and made dried meat from part of it and fresh meat for cooking from the rest. She had lots of blubber now, having trapped a fat spotted seal.

When she ate she didn't give the other one anything. The other asked to have some. "Let me eat," she said, but that little old woman would never give her anything. The other one was hungry and kept asking her how she had trapped the spotted seal, but the little old woman never told the other one how she had done it.

Then the other little old woman began to make all sorts of plans. "I wish I might somehow trap something to eat." She was very eager, that other old woman. With that in mind, she finally went back up there to pick berries. Now, she thought, if she could make a caribou, if she could send a caribou with the current down there into her trap, she might make a caribou; yes, she might make a caribou.

With that idea, she gathered some willow sprouts, twisted roots around them, and was busy the whole day making her caribou back up there. She put antlers on it and shaped it like a caribou, and when she had finished it, she sent it with the current. When the current was about to take it, she said to the caribou she had

made, "Become a bull now and go into my trap down there, be very fat too and big, and go into my trap!" she said to it.

Having done that, she went home. She was hungry while the other was eating meat, the little old woman who had the spotted seal, who had dried meat, who always had seal meat and blubber to eat—she envied her! She begged her time after time, but she never gave her anything.

The next morning, after they had slept, while it was still dark, the little old woman headed for her trap. When she arrived, she saw that her trap down there had been disturbed! It was not as it had been before. When she approached it, behold! A big bull caribou was down there inside her trap, dead. The little old woman got very excited and, while the other one slept, with all her might she tried to pull up the big bull. Oh, it was heavy; she could barely move it! As soon as she got it on dry land, she skinned it, having a hard time moving it. Oh, she thought, it was a bull with lots of back fat that she had trapped!

She hauled it back, piece by piece, and made cooked meat. The other one was sitting right across from her, but when she started eating her cooked meat she ignored her as the other had done to her. The other one begged her too, "you there, you there, I want to eat caribou too. Give me a piece." The other one kept saying that, but each time she answered, "You never let me eat when you feeding yourself on the spotted seal. You never cared for me so now you won't eat."

In that way they lived on, and the one who had gotten the caribou made dried meat. The bull had a great deal of meat on it, and some of it she ate as cooked meat, and she ate Eskimo ice cream, too, and she had plenty, that little old woman. The other one tried to do the same, and she went back up there several times to make a caribou of grass and send it with the current, too, wanting it to become a bull caribou, but she was never able to make a caribou. What she sent with the current never became a caribou.

Having tried that in vain, she went home and thought, now, what if she disguised herself as a man and tried to fool the other one. She might feed her, she thought, if she disguised herself as a man and fooled her. Having gotten that idea, in the morning when it was still dark, the little old woman took her old knife and started cutting her hair. At that time, you see, they had no scissors, so the little old woman tried as best she could to cut with that poor knife, whatever kind it was. When she had finished cutting her hair, the little old woman made her preparations. In her own place opposite the other, she stuffed a parka and put it in the bedding like a sleeping person, and after that, while the other little old woman was sleeping, she went out and entered in her disguise.

Having come in, she said, "Well, which way is she lying? Quiet now! Easy, easy! Over there I have one better than me! She'll hear you, don't make too much noise! I have one over there better than me!"

“Oh, which way is she lying?” Calling like that to find her, pretending to, she was finding her way in, for she had already come in but was on her way to the rear of the house.

“This way, this way, this way, this way!” the other kept telling her, it’s said. “Quiet, easy, easy! Over there I have one better than me!” When the little old woman looked over there at her, she was still asleep.

Then that little old woman hastily put food before her, having got up! As she was eating she kept her face concealed, though, because the moment the other little old woman saw it, she’d recognize her face.

And so they began to live like that. With one taking a fish’s swim-bladder for a penis, they went to bed and “went at it” together. With one taking a fish’s swim-bladder for a penis, the two little old women were “going at it” together. The little old woman over there kept sleeping.

Finally, that caribou of theirs was getting used up, as they ate it. The little old woman ate again and again, all that there was, being careful all the time not to show her face, it’s said. For she was supposed to be an elderly man! So finally the bull came to an end.

The little old woman over there never seemed to wake up. When they finally had no more of it left, the other little old woman finally recognized her, when they had no more of the bull! She got very angry, but the little old woman couldn’t bring it back in any way!

And so they started living again, having no more bull and no more spotted seal either! Living like that, the one who had made a caribou tried in every way to make a caribou but was unable to make another bull, another caribou. No people ever came back to them, either!

After some time, one of them finally got an idea again and said, “They’ll come and get me in a skin boat, they say.” The other one said to her, “You there, you there! May I come aboard then too?” “You’ll dirty it with your parka,” she answered her each time, it’s said. “Down there, they say, they’ll come get me in a skin boat painted red with ochre!”

“You there, you there! May I come aboard too?”

“You’ll get it full of fur.” She kept saying that, it’s said.

In that way they lived for some time. When they realized that nobody would come to fetch them, when fall came, they finally took their dippers as boats to go downstream. When they tried their dippers they could just float! Taking a

sheep's horn as a boat they could just float! Finally they pushed off from shore in their dipper boats. They didn't get far, but were riding low, for their dippers were small! Without getting far, the two little old women sank! Because they sank, those two little old women cannot become the subjects of another story, for at that time they sank forever.

That's the end of the story.

In this humorous story, Ingstad (1954:88) has provided some insights on how the Nunamiut regard the ling cod and how it came to look like it does, as the following passage from his book indicates:

I hauled up a long slimy fish, a ling-cod. Paniaq looked at it and said, "That fellow has an easy job. He just holds his mouth open, attracts small fish with his feeler, and they swim straight in. It's easy to see that this happens, for they always lie head downward in the ling-cod's stomach. The ling-cod (*tittaleq*) is the queerest of all fishes," he continued, "for it is made of almost everything on earth. We know that from an old story. First, it had no body, but was something like a puff of smoke. There were too many fish in the lakes, and the ling-cod wanted to have a body, so it could catch some of those fish." He went on to tell how it made itself a body from the most different things. It took a roll of skin from an old Indian woman and made a forehead; a beluga was used to make ears, and it put walrus whiskers in the ears; it made a backbone of whalebone and fastened to it behind one or two spruce with many branches; it made gills from a swallow and a mouth from the handle of a bucket, and a little woman who was carrying water in a skin bag was used as a chin bone. The story goes on thus with infinite variation. At last, the ling-cod got a complete body. There was only one thing it could not manage properly, and that was to provide itself with such wide bowels that the food would go through comfortably. It was obliged to keep the fish in its stomach so long that it was rotten, and then threw up the bones. "It's easy to see that this story is true," Paniaq concluded. "If you examine the fish closely, you will recognize all the parts I have mentioned and see that the creature is made up of almost everything on earth."

Following in the same vein of fish stories having a teaching aspect to them is this brief story recorded by Lewis Binford, a prominent archaeologist who worked extensively among the Nunamiut during the late 1960s and early 1970s. The significance of this story, and Binford's recounting of it in his book *Nunamiut Ethnoarchaeology*, can best be appreciated by understanding the context in which it was told to him. In the course of his work, Binford was keenly interested in exploring how the archaeological record might reflect the wide and sometimes seemingly infinite variety of logistical choices, options, and circumstances that the Nunamiut exercised. Thus he was forever asking probing questions, particularly of Simon Paneak, a man widely acknowledged as a student of his own culture and one well versed in the practices of traditional Nunamiut life. One day, and doubtless with a little bit of exasperation,

Simon subtly yet clearly, in his own inimitable way, demonstrated that practicality always trumps convention with the following story.

Baby grayling was swimming in the warm waters of Tulugaq Lake. He asked his mother how he could always be sure of getting enough to eat. Mother grayling was silent for a moment, then in a very serious voice said, "Listen carefully and I will tell you how you can always be sure of getting enough to eat." Baby grayling listened intently. Mother grayling said, "Always swim against the current and the water will bring your food to you." Baby grayling thought about this and could not wait to try out his mother's advice. Baby began swimming against the current and sure enough little pieces of food came past him. It was such a wonderful experience that he kept on swimming against the current, swimming against the current, and swimming against the current. Soon baby grayling was up in a small side stream feeding into Tulugaq Lake, but he kept following the rule, swimming against the current, and soon he began to notice that there was less and less food, less and less water; nevertheless, he kept swimming against the current. Pretty soon there was no more food and very little water—indeed, there was nowhere else to go against the current! Baby grayling was very upset, he turned and swam like a flash down the stream back into the warm waters of Tulugaq Lake, where he saw his mother but avoided her. He hated her for telling him the wrong rule! You asking me questions is like baby grayling; I can give you an answer but you must spend the rest of your life learning when not to use it. (Binford 1978:454)

"The Husband Fishers," which is admittedly tangential to fishing, was also recorded by Ingstad in 1949, as told at the time by Elijah Kakinya, and published in 1987. In this instance it employs the metaphor of fishing to illustrate the desirable values of cooperation, sharing, and modesty, while cautioning against selfish, bossy, and jealous behavior and how it can affect a person's life by boomeranging back on oneself.

Now I shall tell Sikrikkauraq's story.

There were three women, it is said. One of the three always tried to belittle the other two women; she always tried to dominate those two fellow women of hers. Then those three women decided to take husbands. Wanting to marry, they started working hard at making fishhooks. The one who tried to belittle the other two women was bossy. When they had an ice-fishing hole, the bossy one got ready to go before the others and, browbeating them, managed to lower her hook first.

Those whom they were going to hook knew that bossy woman, and the young man she was going to hook put the hoods of animals over his hair and made himself gray-haired; he covered his beard and put on old clothes all over, like an old man. For in their land, there where the women were going to fish, there are no old men, no old man to be hooked. So then that girl, having lowered her hook, hooked a very poor old man with ugly, hairless clothes.

Having made her catch and having looked at him, having pulled him up and looked at him, she thrust him back down through the hole again. She lowered her hook again but caught nothing more, that woman.

When she didn't catch anything, when she didn't make another catch, another took over, one of the two she belittled. Then that woman, another of the three girls, hooked a young man. Having pulled him up, she took him and went back home with him and made him her husband. Then the third and last one lowered her hook in turn. And taking out the young man she had hooked from the hole, she went back home with him. Then their bossy companion went on trying her hook again, but again she was unsuccessful.

When she didn't catch anything at all that way, she, who wanted to get a husband too—for the other two were back home with their young men—having caught nothing at all, she set out back home to the others. On her way home, behind her, someone called to her: “I kept on ... *aNaNa uaq-uaq, uaq-uaq*,” and the woman looked back suddenly. When she looked back, she saw a man dancing at the edge of the hole in the ice. As he danced, he said to his girl, “A while ago when I was clawing at the edge of the hole to hold on, you thrust me back under!” Talking to her, he allowed her to come close enough to grab him. The woman ran to him but missed grabbing him; she didn't get close, and he dived back in. After waiting for a while in vain, the woman once again returned home and was very jealous of the others, who were lying together.

On her way back home, she again heard him calling over there, “I kept on. ... *aNaNa uaq-uaq uaq-uaq*,” and again she looked back. Then she ran and reached for him eagerly: “Come, come, hold on, let me take you!” she called, but it was in vain! He had dived down there again, through the hole in the ice. After doing this, he said, “A while ago, if you had taken me home, you could have been my wife,” he said to that woman, the young man did.

She didn't catch anything, being bossy. While the other two got young men for husbands, the bossy one didn't catch anything.

So this was the end of the story.

In closing I present another brief involving fish. This story was told by the late Arctic John Etalook, concerning a robin and a pike fish. As he recalled,

They have a legend of a robin which in a teasing manner was apparently insulting a pike. So in a mean manner the robin teased the pike by saying,

kuyapigaqturutin

Surutin? Surutin?

Siuliik, Siuliik

Kuyapigaqturutin

Surutin!

You have a large spine
What do you have? What do you have?
Hey pike, Hey pike
You have a large spine
That's what you have!

So that was how the robin insulted the pike. The pike must have eaten the eggs from a robin, that was probably why he insulted him so.

While it is not unreasonable to assume that sometime in the not-so-distant past there existed a richer fish-related oral tradition, these few stories provided here represent what is currently available in written form.

XI. SUMMARY

To the best of my ability, this report provides a comprehensive historical overview of the role of fish and fishing in Nunamiut culture and society. It draws upon written, oral, and pictorial resources, combining both contemporary research with that done many years ago by earlier researchers. In the preceeding pages and in the accompanying appendices, an attempt has been made to establish the identity and uniqueness of the Nunamiut people, the nature of the physical environment in which they lived, and characterize their traditional way of life. This included the role of fishing and the traditional fishing technologies they employed to secure fish in the years before large-scale Euro-American contact, as well as the manner of their preservation and preparation.

I drew upon the invaluable work of C. W. Amsden to trace the remarkable odyssey of social and cultural upheaval that overtook the Nunamiut between the late 19th and middle 20th centuries. It was a tumultuous period that witnessed almost continous change and adaptation in their settlement and seasonal patterns. As must be expected, those changes and adaptations also changed their relationship to and reliance upon fish. It is a resource that over the past century has gone from a supplementary one to a critical and primary one and back to supplementary status. Changes in fishing methods and technologies have resulted, too. Some, like the use of traps, spears, gaffs, fish arrows, and lush hooks, have ceased altogether. Others methods like seining, gill and dip netting have fallen off to a remarkable degree although they still survive on a very limited basis. Then there are those that never seem to go out of style: youngsters still rock fish in the falling waters of autumn, and hook and line jigging is as popular as ever, although the lures have made the transition from bone, antler, and ivory to metal spoons and flashers. And then there is the modern technology of spinning reels that have taken over summer fishing activities. It is interesting to note, however, that dry fly fishing never seems to have caught on; perhaps, one might speculate, because fly fishing is hardly what one would consider a lead pipe cinch. There are few subsistence fisherman of sound mind who subscribe to a technology that gives a fish a decent chance at getting away. That is something the Nunamiut have long known and built their fishing practices and technologies around. They are nothing if not practical, skillful, and adaptable: traits that saw them through their entry into the Brooks Range hundreds of years ago, sustained them through the past century of unprecedented change, and will undoubtedly see them through the challenges that will face them in the future.

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XIII. ACKNOWLEDGEMENTS

Not being much of a fisherman myself, either by inclination or avocation, it should come as no surprise that it required the contribution of a great deal of knowledge from a great number of people to assemble this partial, and what sometimes feels like an impoverished, compendium of Nunamiut fish-lore.

Although the final product is emerging under the aegis, and through the joint funding, of the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game, much of what lies within was originally recorded as part of a Nunamiut Survival Skills study funded by the Inupiat History, Language, and Culture Commission of the North Slope Borough. Thus, primacy of acknowledgement must go to them for the support of a research project that seems to have been a bit ahead of its time, at least in terms of conception, if not necessarily completion. This project makes even the extraordinarily lengthy gestation period of a rhinoceros seem speedy in comparison. We acknowledge \$150,506 in funding from the U.S. Fish and Wildlife Service under contract no. 701812J441.

Thanks are also due to Sverre Pedersen of the Alaska Department of Fish and Game Subsistence Division who so cunningly ensnared me into this project, thus giving me the impetus to compiling and more or less completing something started many years before, and at the same time providing a broad and welcome avenue by which project funding could be infused into our local museum.

Thanks also go to the elders of Anaktuvuk Pass who, both in the past and currently, have shared their knowledge of fish and fishing. Among those who have sadly left us in the years between when we started and when we finished were the last two Nunamiut of the old school, Arctic John Etalook (1895-1984) and Elijah Kakinya (1895-1986). These were two men who had truly seen it all and done it all, and I thank them for their contribution. Also gone, long before her time, is Jenny Paneak (1961-2001) who helped as an interpreter when I worked with her grandfather Elijah. Another long-gone elder who made a substantial contribution was her own father, the late Simon Paneak (1900-1975). Although he was already deceased by the time I initiated my work in the early 1980s, Simon's voluminous writings, drawings, and tape recordings represented an extremely valuable trove of information that I have continued to mine to the present day. Among the cadre of contemporary and knowledgeable Nunamiut elders who contributed their experience and expertise and, happy to say, are still with us and thus in a position to exact the appropriate toll for anything I got wrong here, I must thank Justus Mekiana, Johnny Rulland, Zaccharias Hugo, and Rhoda Ahgook.

Contributions of no less merit than those who provided the basic information were made by those who worked as interpreters and translators in the interview process. Thus very sincere thanks are due to Rachel Riley, Louisa Riley, Doris Hugo, the late Jenny Paneak, James Nageak,

and Ada Ahgook. As our museum intern, Ada has been very helpful with interpreting, reviewing taped interviews, and helping line up people for interviews.

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And finally, thank you to Sue Mitchell, for having to take the time—and considerable effort—to properly edit and format my original draft of this report into the form that most pleases the U.S. Fish and Wildlife Service.

Here, unfortunately, I lament the most recent passing of two men: Joshua, “Doc” Rulland and Roosevelt Paneak. Joshua, who we lost during the winter of 2003, was still an active hunter and trapper in his mid-60s. Doc was not only a positive role model for youth, he knew his business, and shared what he knew. He will be missed by us all. Even more recently, in the spring of 2005, came the totally unexpected passing of Roosevelt Paneak, a close friend whose contributions to this work and others came many, many years too soon.

Among the cadre of contemporary and knowledgeable Nunamiut elders who contributed their experience and expertise and, I am happy to say, are still with us and thus in a position to exact the appropriate toll for anything I got wrong here, I must thank Justus Mekiana, Johnny Rulland, Zaccharias Hugo, and Rhoda Ahgook. If by some oversight anyone who contributed to this effort was inadvertently overlooked, I apologize.

APPENDIX I: GLOSSARY OF IÑUPIAQ TERMS RELATING TO FISHING

Fish Spear Vocabulary

<i>Aki</i>	A term for the end barb.
<i>Akilliik</i>	The outward curving side prongs of the spear.
<i>Alluaq</i>	A hole chopped through lake or river ice to fish.
<i>Amiññiq</i>	The narrow flattened fore portion of the shaft to which the spears middle and side prongs are hafted.
<i>Amugitkutaq</i>	The scarf cuts made on the tangs of the center and side prongs.
<i>Arruktaa</i>	The term for the damping or half wetting of the <i>nimiḡun</i> lashing as it was applied.
<i>Iiguaq</i>	An extension of ice that forms on the edge of open water.
<i>Ipu</i>	The wooden shaft or handle of the spear.
<i>Ivisa</i>	A reddish brown mineral stain applied to the spear shaft for both decoration and as a preservative.
<i>Kakiagniaq-</i>	The practice of fishing using a <i>kakiak</i>
<i>Kakiak</i>	The fish spear or leister.
<i>Kakialiḡvik</i>	The V-shaped hafting slot cut into the end of the shaft to hold the tang of the center prong.
<i>Kakkiñ</i>	The pointed blade portion of the center prong of the spear.
<i>Kuugum Paḡḡa</i>	The mouth of a small inlet stream where it flows into a lake.
<i>Maḡḡik</i>	A narrow stream or channel of water connecting two lakes or draining a lake into a river.
<i>Matu</i>	The dark cloth tarp used to cover the willow frames.
<i>Maḡḡuq</i>	The tang or haft end of the center prong.
<i>Niksikkak</i>	The inward curving end barb of the spear.
<i>Nimiḡun</i>	The caribou skin rawhide thong used to lash the center and side prongs in place to the shaft.
<i>Nuiḷak</i>	The shallow mouth of a lake outlet stream.
<i>Pana</i>	Another word for the pointed blade portion of the center prong of the spear.
<i>Qaglu</i>	A pool of quiet deep water in a stream or river.
<i>Qanak</i>	The willow frames used to make one sort of <i>tagḡialliragiitkun</i> .
<i>Qayaq</i>	A fast, maneuverable, narrow, decked over one-man canoe with a wood frame and caribou skin covering, used for hunting and sometimes fishing on inland lakes and rivers.
<i>Qaḡattaaq</i>	A dangerous, undercut shelf of snow or ice at the edge of an area of <i>sikusuiḷaq</i> .

<i>Qilīgvik</i>	The shallow stepped notch carved into the side of the fore shaft to haft the tangs of the side prongs.
<i>Qivliqsaq-</i>	The practice of using wood shavings to rub in and polish the Ivisaaq stain into the wood of the shaft.
<i>Quagrulik</i>	The fine, closely spaced ridged finish given to the spear shaft in order to give a firm grip.
<i>Quniguq</i>	Skin rope, or babiche, often made from skins of caribou but also, though less commonly, those of Dall sheep, moose and bears. In this case it is the material used as <i>nimiḡun</i> to lash the center and side prongs in place to the shaft.
<i>Sikusuiḷaq</i>	Naturally occurring areas of open water in otherwise ice-covered lakes or rivers.
<i>Tagḡialliragiitkun</i>	A type of screen or covering used to improve a fisherman's view into the water by blocking out unwanted surface reflections and other light.
<i>umiaq</i>	An large, open, skin boat, traditionally used in hunting sea mammals, traveling, and freighting.
<i>Umiaqhiuraq</i>	A small, open, willow and caribou skin boat sometimes used for fishing on inland lakes and rivers.

Lush Hook (*Qaḡruqsaqtuq*) Vocabulary

<i>Alluaq</i>	A hole chopped through lake ice through which the baited lure is dropped into the water.
<i>Iputaq</i>	The fishing or tether line to which the baited lures are attached.
<i>Naḡiaq</i>	The bait, also the dangling barbel beneath the chin of the ling cod, which it uses to lure smaller fish into striking distance.
<i>Naqitchin</i>	The stick or club used to subdue a freshly caught fish with a couple of hard blows struck to the head.
<i>Nuiḷak</i>	The entrance or mouth of a lake's outlet stream. A favorite location for setting these baited lures.
<i>Papiḡuq</i>	The underbelly and tail part of a fish, often used to bait the lure.
<i>Pitugvik</i>	A willow stick frozen into the ice to which the tether line is attached.
<i>Pituutaq</i>	Another name for the tether line.
<i>Qaḡruqsaq</i>	The large baited hooked lure used in this method of fishing.
<i>Qaḡruqsaqtuq</i>	The method of fishing using <i>qaḡruqsaq</i> , a large baited hook or gorge, set out overnight in shallow water to catch pike or burbot.
<i>Qaglu</i>	A pool or backwater in a river. Also a favorite location for setting these baited lures.
<i>Qipiutaq</i>	The thin string used to tie the bait to the lure.
<i>Quniguq</i>	Caribou skin babiche line sometimes used when <i>sugqaq</i> is unavailable to make the fishing or tether line to which the baited lures are attached.
<i>Sanniḡuḡiaq</i>	The bi-pointed bone or antler gorge used in this method of fishing, also the name for the tethering stick laid across the hole in the ice.

<i>Siulik</i>	The northern pike, the other type of fish most often caught using this method.
<i>Suqqaq</i>	Strips of whale baleen sometimes used to make the fishing or tether line to which the baited lures are attached.
<i>Tittaaliq</i>	The ling cod or burbot, one of two types of fish traditionally caught using this method.

Fish Traps (*Taluyauraq*) Vocabulary

<i>Amaat</i>	A general term for the thin runner roots of the willow which could also be used to lash a trap together.
<i>Iggiaq</i>	The narrow constriction at the end of the trap frame, through which the fish must pass into the net. Literally the "throat" of the trap.
<i>Ivalu</i>	Caribou tendons and ligaments stripped into sinew and used to weave into a net.
<i>Katchuq</i>	The name of the shaved rib joint.
<i>Kuvraq</i>	The net into which the fish swam
<i>Naunağauraq</i>	The young willow withes used in the making of the fish trap.
<i>Nuluqsraq</i>	Another, though thinner, variety of rawhide line which could be used to lash the trap together.
<i>Nuqtaq</i>	The process of setting up a trap and fence at one location, and then relocating them for use again further downstream.
<i>Paaja</i>	The mouth or entrance to the trap.
<i>Paugaq</i>	The wooden stakes driven into the creek bed to hold the trap and fence in place.
<i>Puuguaq</i>	Another name for the net.
<i>Qiliqsruḡvik</i>	Another term for the interior framing rings, literally "place to tie things to"
<i>Quniguq</i>	A variety of rawhide line suitable for lashing the trap together.
<i>Saputit</i>	A term referring to both the fence and the individual willow bundles used to build the fence. The term stems from the word "sapi" which means to block something.
<i>Suqqaq</i>	Whale baleen which could be stripped and woven into a net for this style of trap.
<i>Taluyaa</i>	The willow withes used to make the body of the trap.
<i>Taluyaqtat</i>	The practice of using a fish trap to take fish.
<i>Taluyauraq</i>	The small, lightweight fish trap.
<i>Tulimaat</i>	The interior framing rings of the trap, literally the "ribs".
<i>Uqpipqpaum amiḡa</i>	Willow bark which could also be stripped and woven into a net for the trap.
<i>Uḡuraq</i>	To drive the fish ahead of you into the trap.

Hook and Line Vocabulary

<i>Aki</i>	The term for the actual hook on a traditional lure.
<i>Alasaun</i>	The wooden fishing pole.
<i>Allu</i>	The term for a fishing hole chopped through lake or river ice.
<i>Aulasaqtuq</i>	An Inupiaq term for hook and line jigging.
<i>Igtak</i>	A treble like hook used for snagging fish.
<i>Īaun</i>	A spoon or net like implement used to clear ice chips or slush from a freshly chopped hole in the ice.
<i>Ipiutaq</i>	The fishing line to which the lure is attached.
<i>Iqualuaqpaqsium</i>	A term referring a fish lure of the size appropriate for catching relatively large fish such as the lake trout, known to the humanist as <i>iqaluaqpak</i> .
<i>Itimaun</i>	A stick used to help retrieve the fishing line from the water when winter ice fishing.
<i>Ivalu</i>	Caribou sinew or tendons, sometimes braided and used as fishing line.
<i>Kukik</i>	The term for a fingernail or claw of an animal like a bear or wolf sometimes used as the raw material for making fish lures.
<i>Manjuq</i>	A term referring to the thick quill section of a birds feather. The quills of some feathers were occasionally stripped and tied together to make fishing line material.
<i>Naqitchiin</i>	A wooden stick or club used to subdue a freshly landed fish.
<i>Niqsigiaqtuq</i>	Another term for hook and line jigging.
<i>Niksikpak</i>	A general term for a large fish lure.
<i>Qulaaniun</i>	A fishing pole with a very long wooden handle that allowed onshore fisherman to fish along the retreating edge of lake ice in the early summer.
<i>Quniguq</i>	A variety of caribou skin rawhide rope sometimes used as fishing line.
<i>Saunaaq</i>	Another term sometimes used to refer to the thick quill section of a birds feather.
<i>Sulukpaugaqsium</i>	A term referring a fish lure of the size appropriate for catching relatively small fish such as the Arctic Graying, known to the Humanist as Sulukpaugaq.
<i>Suqqaq</i>	baleen or whalebone, from the mouth of the Bowhead whale which could be stripped and used as a material for making fishing line.
<i>Tuuq</i>	A long wooden pole tipped with ivory, antler, or metal blade used to chop through thick lake or river ice when ice fishing.
<i>Uqumailutaq</i>	The sinker used to weight down the fishing line and lure.
<i>Uquuttat</i>	An improvised wind break or shelter, sometimes made from blocks of snow, used for protection against the wind on very cold days.

Gill and Seine Netting Vocabulary

<i>Alluvak</i>	The first large hole cut in lake or river ice through which the net is fed into the water.
<i>Ayauppiq</i>	The term for the wooden spreader bars at either end of the net.
<i>Iḷḷaaqtuun</i>	<i>A long pole used to bring in the rope from hole to hole.</i>
<i>Iḷḷaaqtuḡviich</i>	The series of smaller holes cut into the ice through which the net was pulled under the ice using the Iḷḷaaqtuun pole.
<i>Kisaq</i>	the term for the anchor stone used to hold the net in place when set in rivers and streams
<i>Kivitchiun</i>	A term for the net weights tied to the, bottom or foot line of the net.
<i>Kuvraq</i>	A general term for a net but in this instance specifically referring to the gill net.
<i>Kuvrasugruk</i>	A term referring to a net with a large mesh size, used in catching larger species of fish.
<i>Kuvrauraq</i>	A term referring to a net with a small mesh size, used in catching smaller species of fish.
<i>Kuvriniaqtuq</i>	The practice of using a gill net to catch fish.
<i>Nanmautit</i>	The caribou skin dogpack sometimes used for storing a rolled up gill net when not in use.
<i>Nigaq</i>	The term for an individual net mesh
<i>Niggivik</i>	The netting gauge, an implement used as a guide or template to assure that all net mesh, or Nigaq, were made to the same standardized size.
<i>Nuviḷḷaun</i>	The netting shuttle, a large needle-like implement used to
<i>Pituutaq</i>	The term for the tether lines attached to either end of the net.
<i>Puktaḡun</i>	The term for a wooden net float, attached to the top or headline of the net.
<i>Qaaktuun</i>	Seining net.
<i>Qiminji</i>	The term for the main top and bottom frame lines, also known as the head and foot lines between which the netting mesh was hung.
<i>Quniguq</i>	A variety of relatively heavy duty – ¼ to ½ inch wide caribou skin rawhide line used to form the head and foot and side lines of the net, as well as the tether lines.
<i>Tuuq</i>	See above.
<i>Utitchiaq</i>	A general term for a caribou skin from which the hair has slipped. It is the raw material from which Quniguq line was cut.

Processing, Storage, and Cooking Vocabulary

<i>Aḡiparaq</i>	Mostly dried fish.
<i>Argiq</i>	To cook by roasting over an open fire.
<i>Auruq</i>	Aged or fermented fish, prized because of its tangy flavor.
<i>Ikiḡḡaq</i>	A platform style of drying rack.

<i>Iññisaq-hautaq</i>	The term for a willow or spruce pole rack for hanging and drying fish or meat.
<i>Napauttat</i>	A tripod, from which an Utkusiq is suspended over an open fire.
<i>Nunataq</i>	A shallow underground cache pit.
<i>Panaagruktaq</i>	Thoroughly dried fish. (check)
<i>Paniqtaq</i>	A general term for dried meat, especially caribou meat although some people say it can also apply to dried fish.
<i>Pivsi</i>	A term which all agree to specifically refer to dried fish.
<i>Puvlak</i>	Fermented or spoiled flesh that has formed surface bubbles.
<i>Puyuqun</i>	A smudge fire to repel insects from spoiling the fish.
<i>Qaummaqsiaq</i>	The traditional method of boiling, using fire heated rocks transferred to a wooden pot filled with water and meat or fish.
<i>Quaq</i>	Frozen fish.
<i>Quaqlak</i>	Half frozen, or partially thawed fish.
<i>Quaqlak</i>	The liver of a fish, animal, or human.
<i>Sigluaq</i>	An underground ice cellar.
<i>Sikutaq</i>	A storage chamber made of large ice blocks cut from a river or stream.
<i>Tijuk</i>	The liver of a fish, animal, or human.
<i>Uuruliug</i>	To cook by boiling.
<i>Utkusik</i>	The term for a large metal cauldron or cooking pot.

Fish Related Oral Tradition Vocabulary

<i>Iqaluaqpak</i>	The giant lake trout, a legendary fish said to inhabit a number of the larger lakes in the north central Brooks Range, the best known of which is said to dwell in Chandler Lake.
<i>Iqaluum Iñua</i>	Another name by which the fish spirit is known, meaning literally, “the spirit of the fish”.
<i>Qaluich Kanjat</i>	One name by which the fish spirit is known, meaning literally “the source of the fish.”
<i>Quluiaqtuat</i>	An oral tradition, a story, more specifically grounded in personal experience.
<i>Unipkaa</i>	An oral tradition, a story, generally referring to a legendary tale.

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