

Adaptation and Resilience of Salmon Fishing Economies in Southwest Alaska

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In the past Alaska's rural communities have expressed their resilient nature to changing patterns of social and economic change. With colonization opportunities for monetary income such as the now century old Bristol Bay fishery were adapted within the seasonal pattern of resource gathering and out of this came a new mixed economic system of wage labor supporting the traditional subsistence economy. However, in recent years rural communities are undergoing more rapid social and cultural changes. In Southwest Alaska recent studies by the Division of Subsistence, Alaska Department of Fish and Game documenting the subsistence economy and traditional ecological knowledge have centered on the communities that inhabit the Kvichak Watershed, which is comprised of Iliamna Lake and Lake Clark. Some of these studies are partially due to a proposed copper and gold mine. Residents during these studies have expressed concern that social and cultural changes are also happening in an environment where they are also seeing rapid climate changes. These changes included climate variability and unpredictable weather. This creates an environment that is difficult to plan for subsistence hunting and fishing while continuing to take into consideration a work schedule, the money from which provides the means and materials for engaging in subsistence.

Residents of these communities will therefore have to adapt and be resilient. "Adaptation is a culture's capacity to abate negative factors when faced with rapid change. Resilience, or the cumulative effect of processes that maintain an ecosystem in the face of rapid change, is one measure of a systems ability to adapt (Berkes, et al. 2003:13)." We can take the notion of resilience, as applied in the context of natural ecosystems, and apply it to subsistence economies. Subsistence economies in their very nature integrate themselves and adapt to their environmental surroundings. "Indigenous economies have tended to involve the simultaneous and proximal use of multiple resources on a subsistence basis, rather than the intensive, isolated, single resource use that characterizes industrial capitalist societies (Menzies & Butler 2006:5)." In 2004, in the community of Nondalton for example, households used an average of 13.7 different resources with one household using 48 different resources (Fall et al. 2006:28). In this way subsistence economies adapt to the changing circumstances that are the outcome of animal migrations, abundance of fish, presence of wildlife, climatic shifts, and weather patterns and conditions.

The Research

This research is based on three cycles of harvest assessment surveys in the 14 communities in Southwest Alaska shown in Figure 1. The research was undertaken in part due to the Pebble Project which is a proposed open pit mine. The mineral deposit includes gold, copper, molybdenum, and silver. In addition to the mine itself, the project would include construction of a road from the deposit to a port facility on Cook Inlet. Northern Dynasty Mines Inc. (NDM), of Vancouver, Canada, the mine developer, began environmental baseline studies in 2004 to gather information needed for a feasibility study and applications for federal and state permits (NMD 2005; Fall et al., 2006:1). The potential development of the Pebble Mine created the need for updated baseline information about subsistence harvests and uses in the nearby communities, plus demographic and other economic data. Funding in the first year was also provided by Lake Clark National Park and Preserve which needed the same updated baseline data for the resident zone communities of Port Alsworth and Nondalton. The first year of study began close to the mine site and has been expanded each year radiating geographically away from the mine. Research for the year III studies in Bristol Bay communities were just completed this past April and the data is currently being analyzed.

fisheries. Each study year found that the residents of all communities heavily relied on subsistence hunting, fishing, and gathering for nutrition and to support their way of life.

Cultures of Iliamna Lake

This region of Alaska is inhabited by two populations who rely on fisheries for their livelihood. Figure 2 shows a fish camp in Nondalton, a community of mainly Dena'ina Athabaskan people. Yup'ik people's also inhabit this area of Alaska and live in on the southern two-thirds of Iliamna Lake, the Nushagak River, and Bristol Bay as shown in Figure 3.



Figure 2. Fish Camp in Nondalton on Six-Mile Lake

During the early twentieth century fishing in Bristol Bay became an important aspect of life for many residents. The first cannery to open in Bristol Bay was established on the east bank of the Nushagak River at Kanulik. It was opened in 1882 by the Arctic Packing Company (Unrau 1994:144). “Between 1883 and 1903 ten canneries were constructed at various points on Nushagak Bay. In the beginning most of the fishing was done by Euro-Americans while the cannery work force was provided by imported Chinese laborers. Large numbers of Yup’ik were attracted to Nushagak Bay during the fishing seasons, however, and gradually some were able to obtain employment in the canneries in spite of considerable prejudice against them and their abilities as workers (VanStone 1971:22).”

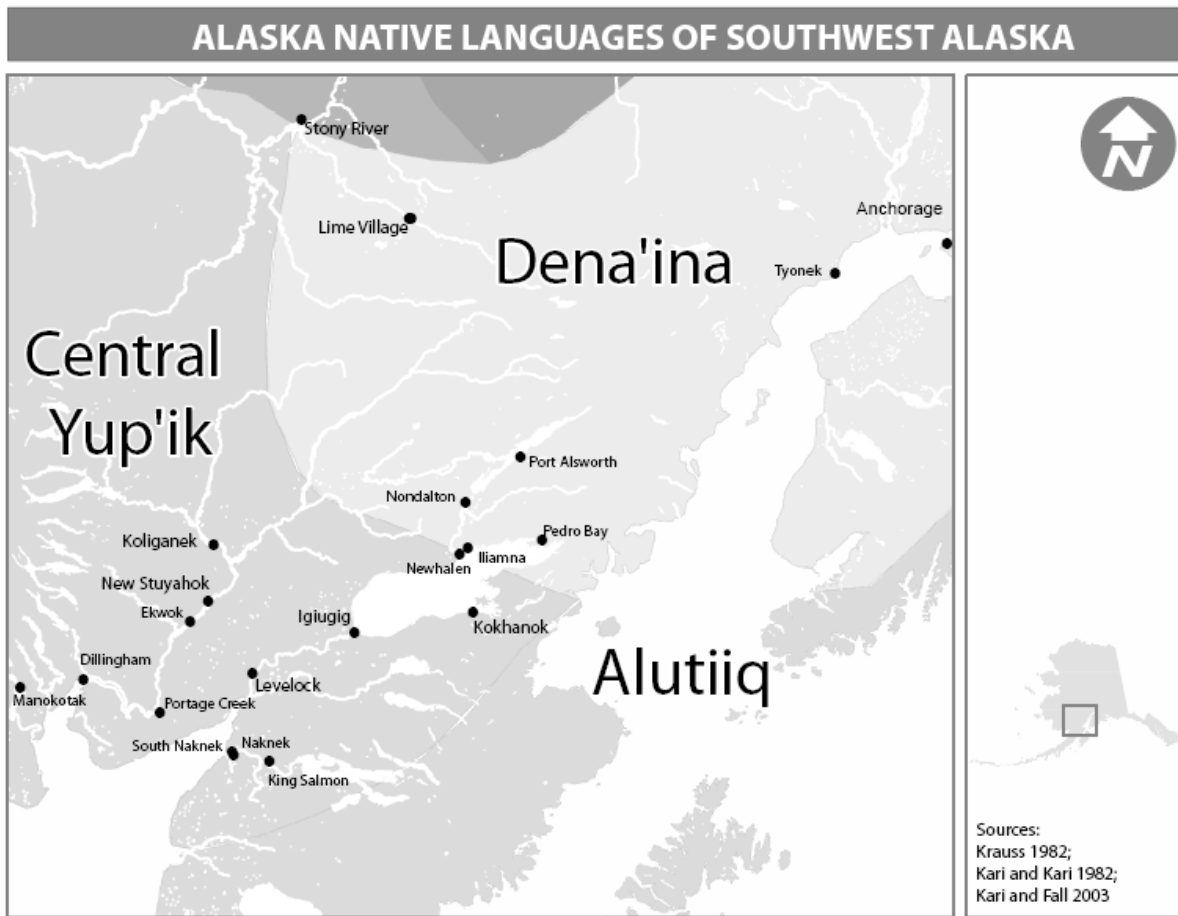


Figure 3. Alaska Native Languages of Southwest Alaska

For the Dena’ina the salmon industry drew people to Bristol Bay from the interior to work in cannery jobs. This was especially evident in the affect felt by the influenza epidemic of 1919 when seasonal migration to the canneries aided the spread of the epidemic to the Iliamna Lake – Lake Clark area (Unrau 1994:159). Salmon have always been an integral part of the seasonal round for Dena’ina people. Fishing continued to be undertaken at home while some members of the family traveled each year to canneries to work.

Working in the canneries was one of the few wage employment opportunities that was offered to local Yup’ik and Dena’ina residents in the early part of the twentieth century. They were allowed to work in the canneries yet they still experienced considerable prejudice. Besides the prejudice felt by local Yup’ik peoples and Dena’ina who travel to the area for work in the canneries, involvement in actual fishing was limited as well. During WW II many of the outside fishermen who had a monopoly on selling to canneries left to join the war effort allowing local Euro-American and

indigenous fishermen to participate in the fishery both as independent operators and as cannery fishermen. By the end of the war local residents had at least gained a foothold in the fishery (Peterson 1983:72).

Commercial fishing for area residents became more and more important in later years and residents in the communities on Iliamna Lake and Lake Clark traveled each spring to Bristol Bay to participate in the commercial fishery, both as fishermen and as processors in the fish packing facilities (Townsend 1979).

Research Findings

Today salmon both for subsistence and wage labor forms an integral part of life for the residents of the Kvichak Watershed. In Nondalton for example salmon comprised 62% of the resource harvests in 2004, the most recent study year (Fall et al. 2006:205). In fact as a percentage of total harvests of all available resources Nondalton had the lowest salmon harvest during the study year as demonstrated in Figure 4. This can be compared to a community like Newhalen which has a greater reliance on salmon as a part of the total year-round harvest of wild resources. Besides fishing for salmon for subsistence which is important, residents of these two communities also commercial fish in Bristol Bay. Nondalton has very few fishermen who still continue to travel to Bristol Bay to fish. Low prices for salmon in recent year according to local residents have meant that residents are no longer traveling to Bristol Bay to fish. Many have sold their fishing permits and boats. This study was for 2004. Interviews conducted over the following three years with local respondents during another study relate that the younger generation of men in the community is now beginning to see the Bristol Bay fishery as a lucrative source of summer income and have taken jobs in the canneries and as crew on boats. This is mainly due to higher prices for Alaska salmon. Other communities such as Newhalen still maintained their participation in the fishery. As a source of income these jobs are very important for many communities. Figure 5 demonstrates that in Newhalen in 2004 24% of residents commercial fished, while 22% of the communities income came from commercial fishing and 52% of households had at least one family member involved in commercial fishing (Fall et al. 2006:64). In Kokhanok on the southern shore of Iliamna Lake residents were still active in the fishery in 2005, the study year. Commercial fishing provided 16% of the income for the community as a whole as shown in Figure 6. In terms of jobs 21% of residents were engaging in commercial fishing and 40% of households had at least one family member commercial fishing (Holen et al. 2008:71).

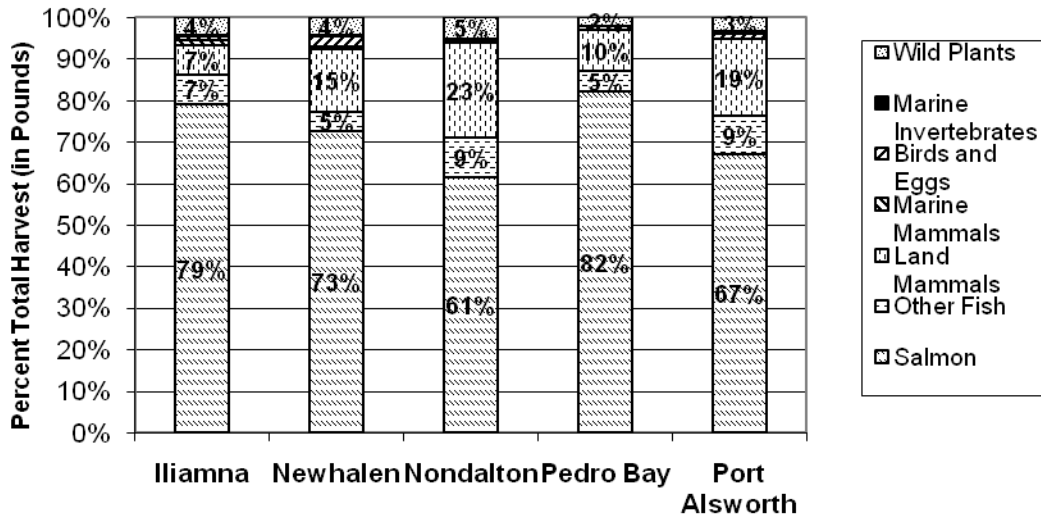


Figure 4. Community Harvest Composition by Resource Category, 2004

This active participation occurred in an era of low salmon prices where many residents were losing money in the commercial fishery or at least barely breaking even. For a century, Kokhanok residents had actively participated in the Bristol Bay commercial salmon fishery. However, in the past few years, low prices for salmon had driven many to let their boats sit idle, or even to sell their boats and commercial fishing permits. One respondent stated that in the past few years many people have said, “The hell with it. We’re leaving [commercial fishing] and not coming back,” after the salmon prices declined and stayed low (Holen et al. 2008:104). Other families bided their time and continued fishing in the hopes that if they just kept at it, the price of fish would eventually improve, but they barely broke even. Some expressed optimism that the price of fish would raise to a point such that a few people could return to commercial fishing and make a living.

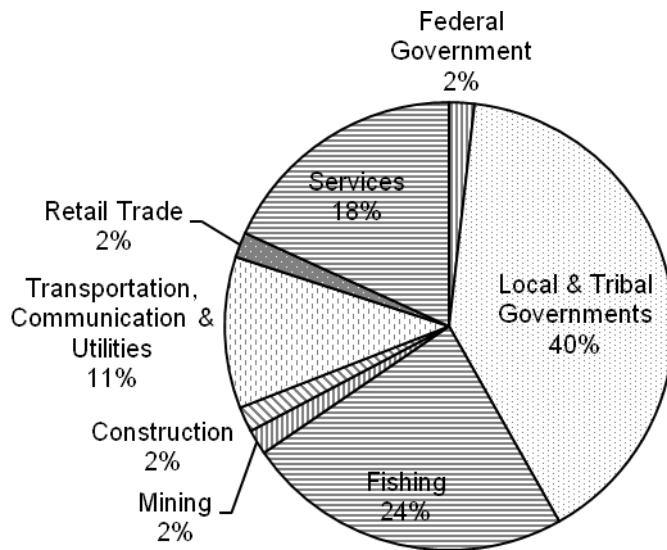


Figure 5. Newhalen Jobs by Industry, 2005

This occurs at a time when the cost of gasoline was of major concern to Kokhanok residents and directly affected their ability to travel by 4-wheeler, snow-machine, and boat to harvest subsistence resources. For example, residents found moose hard to find in September 2005; the price of gasoline limited the amount of time hunters could spend looking for moose (Holen et al. 2008:102). One hunter said that each time he hunted moose it cost \$100 for fuel. Therefore, residents spent less time hunting large land mammals and more time concentrating on those resources closer to home, including fisheries resources available by traveling in skiffs on the lake.

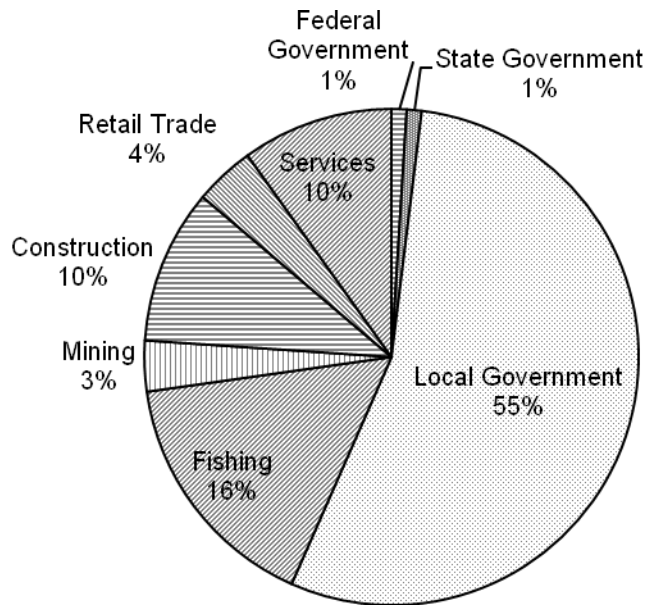


Figure 6. Kokhanok Jobs as a Percentage of Total Community Income, 2005

Discussion and Conclusion

The household survey findings demonstrated that residents of communities in the Kvichak Watershed use a wide variety of resources. They invested a great deal of time and effort in harvesting subsistence resources. Nevertheless, per capita harvests, while substantial, were lower than in previous study years. An example for Igiugig demonstrates a general decline over time as shown in Figure 7. A major concern voiced by community residents who commented on the survey findings, was that one year of harvest data should not be viewed as necessarily representing adequate or desirable levels of harvests (Holen et al. 2008:66). For example, when abundance of salmon or caribou dropped, these resources did not necessarily diminish in importance to the community. Rather, harvest effort generally increased when a resource was scarce, reflecting the continuing significance of these resources to the community's economy and way of life. In short, Igiugig residents did not want comparatively lower harvests to be perceived by others as indicating less interest in, or dependence upon, these resources (Holen et al. 2008:66). Residents still hold a great deal of importance in subsistence resources for their livelihoods. Subsistence is one of the prime factors for remaining in these communities. However, with higher fuel costs affecting hunting and

fishing effort, transportation to other communities, the cost of groceries, heating fuel, and many other basic aspects of life, will residents continue to remain in these communities? There is the real possibility of outward migration to urban centers in Alaska as some economic studies have shown. However, looking back over a hundred years of engagement with the Bristol Bay fishery is one way we can see that these communities have remained resilient in the face of change. Recently though low salmon prices drove some residents out of the Bristol Bay Fishery. A steady yearly income is important for living in rural Alaska to not only pay the normal cost of living, which is high in rural Alaska, but also to buy the necessary means to engage in subsistence. Factors like weather will continue to be a problem that residents will have to face. But it is jobs that will be necessary to address the cost of living in rural Alaska. The potential of a mine in the area leave many people confused. As one respondent related if you ask 20 people their opinion on the mine you will get 30 answers. The sanctity of subsistence resources and the spawning ground of the Bristol Bay fishery versus having a job.

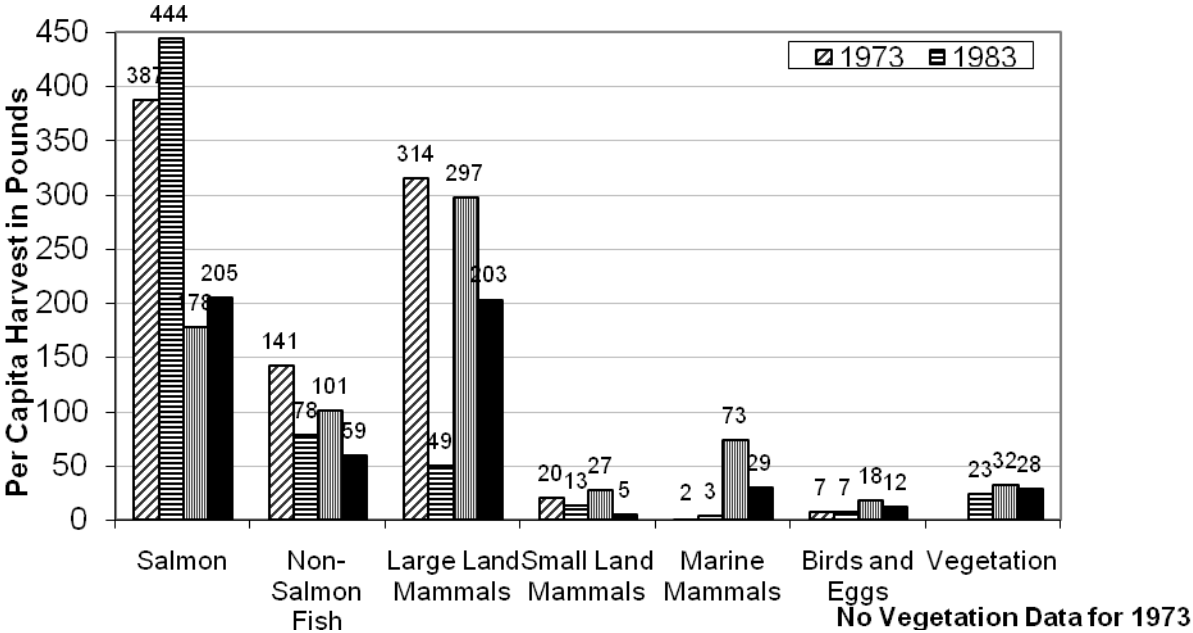


Figure 7. Igiugig Wild Resource Harvests over Time

These communities are resilient and will adapt. A century of fishing in the Bristol Bay fishery with its ups and downs, cultural and social changes, the changing character of life and social relations in the modern world, the price of fuel, climate change and unpredictable weather all create the need for adjustments in order to maintain the resilient subsistence economy, especially the salmon fishery which is an integral part of life. When viewing subsistence activities through these harvest assessment studies, we find that especially for the Dena'ina and Yup'ik residents of this area subsistence activities, especially fishing for salmon, remains a central focus of the yearly ritual and it will continue as long as the salmon return.

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