Robert Schroeder
Rhonda Mazza

A synthesis of recent subsistence research in southeast Alaska

Introduction

Subsistence harvests of game, fish, and plant material have buffered Alaska residents from the historic booms and busts of the market economy, and for many, defines their way of life. (Fall 1990, Glass and Muth 1989, Wolfe and Walker 1987). Although subsistence harvests occur elsewhere in the nation (Emery and Schroeder 2002), there is far wider dependence on subsistence resources in Alaska. Nearly all rural Alaska communities (about 20 percent of the state population) depend on subsistence resources to meet some portion of their nutritional needs (Wolfe 2000). Because of the socioeconomic importance of subsistence in Alaska, the use and management of subsistence resources is at the forefront of political and legal debates.

Since the 1980s, much research has been done examining the use of subsistence resources in rural Alaska (Fall 1990). These earlier studies provide baseline information that identifies trends in current subsistence use. The extent of subsistence research in Alaska is unique to the state. Elsewhere around the world, research has been conducted on indigenous subsistence harvests, but many of these studies stand alone, identifying use at a particular point in time. Natural resource managers and policy makers often do not have the luxury of waiting for extensive studies to be completed before they make a decision regarding resource use. In such a situation, it can be helpful to examine similar research that may add context to the decision at hand. The subsistence research in Alaska, therefore, is unique and may serve as a reference point for subsistence studies elsewhere.

This chapter examines the social and legal contexts for subsistence studies in southeast Alaska. In this chapter, we use results for field studies undertaken as Tongass Land Management Plan (TLMP) administrative studies to identify general characteristics of subsistence and compare them with characteristics identified in existing literature. Finally, this chapter suggests areas for further research.

Background

Subsistence has a number of meanings in Alaska. In 1980, Congress defined subsistence as

> (t)he customary and traditional uses by rural Alaska residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption, for barter, or sharing for personal or family consumption; and for customary trade (Alaska National Interest Land Conservation Act [ANILCA] VIII section 803).

From a social science perspective, subsistence includes the rich cultural complex encompassing the production and use of food from the wild. This complex includes an economic aspect—the efficient harvest of natural foods that are unavailable from other sources. Many Native communities and households have low cash incomes and subsistence harvesting puts quality food on the table. Along with meeting nutritional needs, the harvest of traditional foods fills a cultural need and has become a defining characteristic for being a Native Alaskan.

For non-Natives living in the rural communities of Alaska, use of fish and wildlife frequently is central to their chosen lifestyle. Both Natives and non-Natives have high participation rates in use of fish and wildlife, and both groups rely heavily on wild foods. A survey of rural Alaska households revealed that 86 percent used wild game and 95 percent used fish (Wolfe 2000). Given that roughly two-thirds of Alaska land is under federal management, much subsistence harvesting takes place on federal land. This is the case in southeast Alaska where the Tongass National Forest comprises 80 percent of the land base. Residents of the sparsely settled rural communities surrounded by Tongass land continue to depend on native fish and wildlife population as a source of food. Because both state and federal law protect subsistence uses, the regulating agencies have implemented studies on subsistence resources and their use. Results from these studies provide a factual basis for regulations concerning subsistence harvests and land management decisions in areas where subsistence resources are harvested.

The Social Context for Subsistence Use

In 2000, southeast Alaska had a population of 73,302 living in 35 main communities (U.S. Census 2000). About 61 percent of the area's population live in the city and boroughs of Juneau and Ketchikan, the only two communities considered as urban areas for subsistence purposes. An additional 23 percent of the area's population resides in the communities of Petersburg, Haines, Sitka, and Wrangell. The remaining 16 percent of the population lives in communities ranging in size from Elfin Cove with 32 people to Craig with 1,397 people (U.S. Census 2000).

Alaska Natives make up 22 percent of the region's population with about 54 percent of the Native population living in the rural communities. The rural communities include some places that are predominately Native, other logging and fishing communities that may be predominately non-Native, and places with more mixed ethnicity. The Bureau of Indian Affairs identifies 17 localized Indian tribes in the region including the Metlakatla or the Annette Island Reserve. The Central Council of Tlingit and Haida Indian Tribes of Alaska provides a regional tribal organization. At time of contact, tribes occupied seasonal camps and temporary villages throughout traditional territories. In the late 1800s, the individual tribes of the region coalesced at what had been their winter villages. The area's extant tribes live within their earlier territories and use a similar set of subsistence resources, thus maintaining long standing ties to place. For Native people, this tie to place and the harvest and use of traditional foods are key elements in fostering Native cultural identity (Alaska Native Heritage Center 2000).

The Legal Context for Subsistence Use

As mentioned above, subsistence has a legal meaning unique to Alaska. In 1971, the Alaska Native Claims Settlement Act (ANCSA) settled aboriginal land claims in Alaska and extinguished aboriginal hunting and fishing rights. Congressional records reveal Congress assumed the Department of the Interior would protect the subsistence needs of Native Alaskans by making land withdrawls for that purpose (Alaska Native Commission 2002). Such withdrawls were never made. To remedy this oversight, Congress included provisions for subsistence priority in the 1980 Alaska National Interest Land Conservation Act (ANILCA). Besides reserving 131 million aces of land for federal management, ANILCA established legal protection for subsistence way of life. The act maintained

> The continuation of the opportunity for subsistence uses by rural residents of Alaska, including both Natives and non-Natives, on the public lands and by Alaska Naives on Native lands is essential to Native physical, economic, traditional and cultural existence and to non-Native physical, economic, traditional, and social existence.[1]

The provisions in ANILCA attempt to protect subsistence resource harvest by establishing a harvest priority for rural residents.[2] In times of resource scarcity or when demand exceeds biologically sound harvest levels, subsistence harvests have priority over other consumptive use of resources. In practice, this means that commercial, sport, or other harvests are curtailed by state or federal fish and wildlife management authorities before subsistence harvests are limited. Management of subsistence resources on federal land was left to the state as long as the state maintained the harvest priority for rural residents. The Alaska legislature quickly passed a regulation to comply with ANILCA. However in 1989, the State Supreme Court[3] ruled that a harvest priority for rural residents conflicted with the state constitution, which guarantees all Alaskans equal access to the state's natural resources.[4] This ruling took the state out of compliance with ANILCA and, since 1990, the federal government has managed subsistence resources on federal lands.[5] The Forest Service, therefore, has the unusual responsibility of managing subsistence harvests of fish and wildlife on the Tongass National Forest.

The legal requirements of ANILCA and related state subsistence law were the impetus for initiating community and subsistence research in the early 1980s. The federal and state governments needed to document, map, and understand subsistence uses if they were to manage for subsistence hunting and fishing.

Research Approach

Over the past two decades, subsistence research in southeast Alaska communities has included ethnographic studies, use area mapping, retrospective household surveys, and topical examinations of specific subsistence harvests. Early ethnographic research provided baseline data on the small communities in the Tongass National Forest area and indicated a general approach to understanding and describing subsistence uses (see De Laguna 1972, Emmons 1991, Suttles 1990). The Tlingit, Haida, and Tsimshean societies of southeast Alaska belong to the northwest coast cultural area; perhaps more than other members of this cultural area, they have been able to maintain their traditional use of fish and wildlife. The orientation of the ethnographic work considered that subsistence was intimately tied with other aspects of Native culture and that, as such, it was best examined holistically.

Subsistence fieldwork has proceeded in cooperation with the Forest Service, Alaska Department of Fish and Game, and the area's tribes and communities. The Pacific Northwest Research Station and the federal subsistence program have implemented several recent. During the 1980s, the Forest Service supported research that examined the impacts of timber harvests in the Tongass National Forest on subsistence resources in the area (Schroeder and Kookesh 1990, Firman and Bosworth, George and Bosworth, Mills and Firman, Ellana and Sherrod, Leghorn and Kookesh, Smythe, Cohen, Mills, Gmelch and Gmelch **add full cites**). Subsistence research continued with the Tongass Resource Use Cooperative Survey (TRUCS) in 1988 and the subsequent Tongass Subsistence Studies (TOSS). This research yielded quantitative subsistence harvest data as well as mapped data layers for 30 rural communities in southeast Alaska. Supplemental studies were undertaken to address data gaps and help the Forest Service meet its legal requirements to manage subsistence harvests of fish and wildlife on federal land, and to understand and mitigate the effects of its land use actions on subsistence resources. Through these supplemental studies, larger questions concerning change and continuity of subsistence characteristics in Tongass communities (add citation), Native societies (add citation), and Native hunting and fishing traditions (add citation) have been examined. Since the early 1960s, large scale timber harvesting with attendant road building and other infrastructure development has taken place in many areas of the Tongass National Forest. These supplemental studies looked for trends in harvest levels and subsistence participation that might indicate a change in subsistence activities as a result of timber management. Indirectly, this examination provided an indication of the robustness of

subsistence systems and of the effectiveness of ANILCA procedures concerning land use actions. This long series of subsistence studies in southeast Alaska provided baseline data and analysis used in the Tongass Land Management Plan (TLMP) revision process.

The TLMP subsistence administrative studies are the latest series of field studies to be undertaken. From 1997 to 2001, interviews were conducted with 1064 households in 24 southeast Alaska communities. The fieldwork was conducted cooperatively with the Alaska Department of Fish and Game, Division of Subsistence, and with the areas tribes and communities. For full detail about the methods of data collection, see the Alaska Department of Fish and Game, Division of Subsistence community reports (in press). Summary data from this community harvest assessment project are available in a statewide community profile database accessible through the Internet.[6] The data are being analyzed for subsistence trends, inter-community differences in subsistence harvest, the spatial fidelity of subsistence harvesters to traditional areas, diet breadth and species dependency, and the concentration of harvest by high harvesters. Preliminary results are described below.

Results

The survey field data allow comparison of recently collected subsistence harvest data with data collected in studies in the 1980s. A number of subsistence characteristics can be seen in these data. First, wild foods provide a large dietary component for residents of the studied communities, with a range of 161 pounds per capita for Petersburg in 2000 to over 600 pounds per capita for Klukwan in 1996. The average American diet includes about 225 lbs of meat, fish, and poultry on a per capita basis. In most of the study communities, wild foods come close to, or exceed, this national average. Although residents of subsistence communities purchase food, they could meet their entire protein need from wild sources.

Marine resources including, fish, mammals, and plants comprise the majority of subsistence harvests in all communities when measured by food weight. Figure 1 (***20-22 Res cats final, Chart and Table 2000 exploded***) shows example data from Yakutat where marine resources accounted for 83 percent of total subsistence harvests by food weight. Generally, marine resources account for 80 percent or more of the total harvest across southeast Alaska communities. Because of the overwhelming reliance on marine resources, timber development and other land management activities, which may have degraded subsistence opportunity for harvesting land mammals, has had limited effect on overall subsistence harvests.

Second, the recent data are consistent with per capita harvest levels across different time periods. That is, recent harvest levels appear similar to those harvest levels estimated in the late 1980s or before, with a tendency toward increased levels. In a few communities, such as Coffman Cove, Kasaan, Klawock, and Port Protection, there are large differences in harvest levels over time. However, a closer examination of these cases reveal that harvest levels appear to have been influenced more by special events than by patterned changes in subsistence harvests. Klawock had a particularly strong eulochon harvest and made more fish oil than usual. Coffman Cove, Kasaan, and Port Protection have small populations; harvest levels in these places are influenced by changes in harvest behavior of a small number of people. The main Native communities and the larger communities show remarkable consistency in harvest. Harvest levels in the recent harvest assessments in Angoon, Hoonah, Hydaburg, Kake, Petersburg, Wrangell, and Yakutat, for examples, align closely with earlier work.

A third subsistence characteristic emerging from the data is that subsistence harvest levels differ across the communities of the region. The data show that residents of different communities harvest natural resources at very different levels. An understanding is developing that

intercommunity variability may not be explained by ethnicity, income, community size, or access to resources. Factors that are more difficult to quantify, such as community demographic composition, cultural traditions and orientations, and community history may have more influence on harvest levels than more easily analyzed standard socioeconomic variables.

Table 1 shows a typical distribution of subsistence harvests across species. In Yakutat, some subsistence harvesters use at least 65 different species of the approximate 150 species used by the community; the top 10 species accounted for 84 percent of the total subsistence harvest in terms of food weight. These data indicate that while subsistence users have large diet breadth in that harvesters make some use of most of the available edible species found in their environment, actual harvest is concentrated. This large diet breadth, along with concentrated reliance on a relatively small number of species was found to be a general characteristic across southeast Alaska study communities. Interestingly, the contribution of a particular species to the total subsistence harvest appears to vary from year to year, although the total harvest in food weight, may remain nearly constant.

An examination of the distribution of subsistence harvests within communities revealed that a small number of high harvesting households account for a disproportionate share of the total community harvest. The high harvesting households harvest more fish and wildlife than their family members can consume. The surplus is distributed to other subsistence users through a kinship network and through barter and trade. These networks also are used to distribute specialty subsistence products such as herring roe and hooligan oil, which are produced abundantly in only a few communities. Figure 2 (***18 cumwt 6-14, Chart All Households***) shows a typical distribution of harvest, again using Yakutat as an example. In terms of food weight, the highest harvesting 25 percent of households take about 75 percent of the total community subsistence harvest. The lowest harvesting 50 percent of households take just 8 percent of the total community harvest, using food weight as a measure.

Along with wildlife and fish, rural southeast Alaska communities make regular subsistence use of at least 77 plant species; additional species with medicinal properties were used less frequently. Most of these data come from nontimber forest product (NTFP) studies. In southeast Alaska study communities, generally over 80 percent of households use some NFTPs in a typical year. These NFTPs are botanical products with food, medicinal, or craft uses. Harvest levels of NTFPs used for food ranged from a few pounds per household to nearly 100 pounds per household. In most communities, edible berries accounted for the majority of the NTFP harvest. Subsistence is the main use of these NTFP resources because they have not been significantly commercialized in southeast Alaska. Rural respondents expressed concern about possible commercial exploitation of traditionally used NTFPs and strongly opposed commercial use of *Oplopanax horridus* (devil's club) and other medicinal plants.

Discussion

The subsistence research in southeast Alaska done as part of the Tongass administrative studies yields four general characteristics about subsistence users and their practices. These characteristics support existing findings for subsistence use in Alaska. Subsistence research in Alaska is unique to other places in that it has been studied methodically for the past 20 years, and prior to that, a number of ethnographic studies dating back to the early 1900s were done on multiple communities (Emmons 1991, DeLaguna 1972, Goldschmidt and Haas 1998, Oberg 1973). In Alaska, therefore, there is baseline information that is lacking for other subsistent communities around the world. There is value in placing the Alaska body of research in a global context because the developed protocols for collecting subsistence data in Alaska may be useful elsewhere, and subsistence research outside Alaska may yield new information and analyses.

Subsistence research reveals that wild foods remain a large part of the diet in Alaska rural communities. This indicates that currently, sufficient resources are available to meet subsistence needs. The research, however, does not address the amount of effort that is expended to meet these needs. In India (Gardner 1993), South America, and Africa (Escamilla et al. 2000; Fa, Peres and Meeuwig 2002; Fiztgibbon, Mogaka, and Fanshawe 1995; Souza-Mazurek, R.R.; et al. 2000), studies have shown that subsistence hunting, fishing, and gathering are still a viable way to nourish a group of people. In some way all of these studies addressed the question of sustainability—are the available subsistence resources able to meet the needs of a growing population of users even in the face of habitat disturbance from either human or natural actions? Although the effect of habitat disturbances, such as logging and mining, on subsistence resources is a concern in Alaska, an advantage that subsistence users in the state have over many subsistence users elsewhere in the world is a lower population density and growth rate. The state's population grew by 1.3 percent between 2000-01 (U.S. Census). In comparison, Escamilla et al. (2000) reported their study site in Mexico as having a 9.3 percent annual increase in population. In the Congo, Fa, Peres, and Meeuwig (2002) determined subsistence hunting was unsustainable because the hunted resources would have to annually produce 93 percent of their body mass to balance current extraction rates. The availability of subsistence resources in Alaska has undoubtedly slowed any transition away from a subsistence lifestyle.

The southeast Alaska data revealed a continued reliance on marine resources among subsistence households. Because there is a subsistence priority in Alaska, competition between subsistence and commercial fishing is theoretically diminished. Both activities, however, are extracting the same limited resource. Other studies have examined the relation between commercial and subsistence fishing. Craig, Pontwith and Aitaoto (1993) found that in American Samoa fishing trips can rarely be categorized solely as a commercial or subsistence endeavors. Fish for each use are often caught on the same trip. This dual use of equipment has also been found in Alaska. Klawock residents ceased fishing from a particular island because as commercial fishing declined in the area, some residents purchased vehicles rather than boats and consequently no longer could access the area even for subsistence harvests (Ellanna and Sherrod 1987). Resource managers need to be attuned to user preferences and be aware of changes in these preferences to effectively manage both subsistence and nonsubsistence resources.

Subsistence harvest levels in rural Alaska communities are about the same as they were in previous studies. These harvest levels have been maintained despite changes in species abundance and distribution, changes in community size and composition, impacts from timber harvesting, and competition with other users. This general harvest consistency partially reflects the continued health of the subsistence resources upon which rural residents rely. However, that harvest consistency over time also may reflects cultural characteristics of community subsistence harvests. Subsistence harvesters appear to fill societal needs for subsistence foods and these needs that may not be elastic. Subsistence harvesters do what is required to meet these needs and then curtail their harvesting activity. Interview data suggest that harvesters may be expending more effort in obtaining subsistence foods, but it is difficult to quantify time spent in subsistence activities. Hunting is a routine part of a subsistence lifestyle, and to some extent is opportunistic. It is often difficult, therefore, for a subsistence hunter to recall the specific amount of time spent hunting. A sport hunter, on the other hand, can answer more easily a survey question directed at time because the sport hunter most likely, took a specific weekend or set period of time to go hunting. To some extent subsistence hunting effort has been calculated elsewhere. For instance, Fa, Peres, and Meeuwig (2002) measured the hunting effort expended by indigenous communities in the Amazon and the Congo basins to determine the sustainability of bushmeat as a subsistence

resource. However, a lack of baseline data inhibited them from addressing changes in hunting effort over time.

The third characteristic is that not all communities harvest at the same levels. Community demographics, cultural traditions, and history may influence subsistence harvest levels. These factors are more difficult to analyze than standard socioeconomic variables, which underscores the importance of continued fieldwork in Alaska and elsewhere so better understanding can be gained.

The fourth characteristic reveals that a small number of households harvest the majority of the resources and then share them within a kinship network. The importance of sharing within a community has long been observed within Alaska communities (Wolfe 2000). Examining subsistence as an economic system, Lonner (1986) finds "it is kinship and exchange ties which maintain the system." From a management perspective, this means that when setting bag limits, it must be considered that the hunter may be hunting for more than one household. As a general characteristic, it follows that is important to understand the customary distribution and use of subsistence harvests.

Areas for Further Research

Several areas of study would augment our understanding of how subsistence systems change over time. At the largest scale, subsistence research examines the transformation of indigenous cultures as modern hunter-gatherers recreate themselves in the current era. In the United States, a fundamental question is will Native Americans maintain a tie to land and traditionally used natural resources despite pressure to assimilate with the majority society? At a finer scale, subsistence research lets us evaluate the implementation of management strategies that provide protections for subsistence resources and their uses.

Harvest assessment studies should continue because they provide essential field data for analyzing and understanding change and continuity of subsistence uses. Now that methods for undertaking harvest assessments are well developed, most harvest assessment and other field research should be done directly by communities and tribes. Although some protocols exist for collecting subsistence data, questions to quantify time and effort spent on select subsistence harvests should be developed.

Future research should address a number of near term issues. Discrete studies should address the interaction of the rapidly expanding tourist industry on existing subsistence uses. Southeast Alaska receives over 1 million visitors during the 5-month tourist season; the same season when most subsistence harvesting is undertaken. This growing tourist presence may interfere directly with some subsistence activities, for example when tourists' presence interrupts marine mammal hunting. Even without physical disruption, tourism may alter the sense of place that is central to subsistence activities. In a related area, subsistence users are experiencing more significant competition for resources with commercial fishers, sport and charter fishers, and with sport hunters. Although fish and wildlife populations continue to be healthy, more demands are being placed on limited resources. We need to better understand the character of these resource conflicts and suggest management alternatives that might mitigate future conflict.

Habitat change is a legacy of the large-scale timber programs on the forest. In addition to the Forest Service, Native Corporations have actively harvested timber in on land granted to them in the 1971 by ANCSA. Winter habitat for deer has been lost through logging, and dense second growth stands appear insufficient substitutes. Deer population models indicate deer numbers will decline as a result as the does their winter habitat (Hicks 2001). This likely will affect the ability

of subsistence hunters to meet their needs. Research should identify areas where declining deer populations will most strongly affect subsistence hunting, suggest mitigation measures, and evaluate the outcome of actions taken.

The Forest Service has been the lead agency for managing subsistence hunting and fishing on federal land in the Tongass National Forest since 1990. This role may continue indefinitely. Studies should examine the effect of this unusual system of dual state and federal management of fish and wildlife on subsistence uses. Has this *ad hoc* system maintained subsistence uses and adequately managed the fish and wildlife resources upon which rural residents depend?

Finally, further Pacific Northwest Research Station involvement in subsistence should include development of protocols for monitoring and evaluating assessment methods and ANILCA Sec. 810 procedures that may then be transferred to the Tongass National Forest and the Regional Office for plan and project implementation.

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[1] See ANILCA, Title VIII, Sec. 801 or 16 USC 3111. Note that subsistence applies to rural residents, not only to Natives. Nevertheless, this provision of ANILCA is frequently seen deserving the special legal consideration given to Native legislation.

[2] See ANILCA Title VIII, Sec. 804 or 16 USC 3114.

[3] McDowell v. Alaska, 785 P.2d (1989).

[4] Alaska Constitution, article VIII, sections 3, 15, and 17.

[5] The State of Alaska has been unable to amend its constitution to make it possible to comply with ANILCA requirements or to interest the United States Congress in changing ANILCA. This issue has become a continuing rift zone between Alaska's Natives who rely on ANILCA protections and other Alaska groups who oppose federal management and/or Native subsistence protections.

[6]< http://www.state.ak.us/adfg/subsist/geninfo/publctns/cpdb.htm>