Managing by the Numbers?
Examining Barriers to Harvest Assessment
in a Southeast Alaska Subsistence Salmon Fishery

by

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This thesis identifies and discusses a variety of historical, economic, and regulatory barriers to the collection of harvest data for a subsistence salmon fishery on Southeast Alaska’s Chilkat River. The research on which this paper is based also elicited suggestions for improving participation in and accuracy of future harvest assessment efforts. Research was conducted using standard social science interview methodology, participant observation, and reviews of historical and regulatory documents. Barriers identified include a general dissonance between harvesters and management bodies in relation to the valuation and documentation of fisheries resources, as well as specific regulations regarding gear types, seasonality, area, species, and allocation of harvest that contradict customary and traditional harvest practices. These factors contribute to low levels of communication and trust between user groups and management bodies, resulting in non-participation in harvest assessment efforts among user groups. Conventional management approaches, legal mandate, and a shifting political climate are presented as factors contributing to the motivation for this type of research intended to better document characteristics of subsistence harvest. Ultimately, this thesis argues that harvest assessment would be improved through a more inclusive cooperative management effort.
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Introduction

In the State of Alaska, the Department of Fish and Game tracks harvests of salmon by region, community, gear type, and area. For harvests of salmon under the subsistence category, the harvest numbers used for management purposes are based largely on returned subsistence harvest permits returned to the department. For a number of reasons, it is probable that these numbers do not accurately represent the total subsistence harvest and that they may not represent all the use areas or gear types employed in the fishery. Complete and accurate harvest assessment is considered vital to the management of fisheries, as these numbers help determine the strength of runs and associated allowable harvest levels and allocations.

The seasons and composition of subsistence harvests have changed over time due not only to harvesters’ participation in commercial fishing and other wage labor, protected areas strategies, changes in available technologies, and the strength of specific salmon stocks, but also as a result of new regulations under state management. The regulations as they stand today, and as they have been written and enforced over much of the past 40 years, have failed to recognize a variety of customary harvest practices. This has ultimately led to difficulties in collecting harvest data. The collection of accurate harvest data is important in making management decisions, particularly in light of a regulatory and legal requirement to prioritize the subsistence harvest of fish and game resources over other harvest uses, as well as a political climate that increasingly emphasizes responsible and participatory resource management.

With the goal of improving overall management decision making, the State of Alaska’s Department of Fish and Game (ADF&G) is cooperating with local and federal institutions to develop recommendations for improving harvest assessment for subsistence fisheries. The following paper examines the results from a specific research project related to these efforts, locating the experience of harvest assessment for the Chilkat River subsistence fisheries within a setting of historical, economic, and regulatory influences that have contributed to the current state
of management efforts and resource use of the river.

This research on Chilkat River salmon harvesting also reflects efforts toward greater integration of local perspectives into discourse about natural resources, an approach often previously overlooked in management settings (Pinkerton 1989; Berkes and Folke 1998), despite the historical role of emic concepts of and engagement with natural environment as an anthropological subject (e.g., Steward 1955; Conklin 1957; Rappaport 1968; Netting 1977; Davis 1993). In contrast with a history of research motivated, designed, and guided primarily by academic and personal interests of the researcher (Menzies 2001), efforts are increasingly being made to engage in collaborative projects involving both management bodies and local communities working to identify and substantively address a variety of resource-related issues (Merculieff 1993; Sallenave 1994; Neis and Felt 2000). Applied research of this kind occurs at the confluence of social sciences, natural sciences, and resource management, contributing both to emerging interdisciplinary dialogues and to improving decision making in resource management settings.

In this thesis, I will describe the ways in which the recent regulatory restrictions on customary and traditional subsistence harvest practices for salmon on the Chilkat River in Southeast Alaska ultimately result in inaccurate harvest reporting for these fisheries. In addition, the paper will offer several suggestions for improving harvest assessment through recognition and integration of both customary and traditional use patterns and subsistence user groups into management decisions. I propose that transition to a cooperative management regime that includes comprehensive and equal participation by both user groups and conventional

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1 Although there is ongoing debate in social sciences about the implications of using the word "traditional" to describe human behaviour and practice, the phrase "customary and traditional" is commonly applied to home harvesting patterns among Alaska's Native and rural residents. Both state and federal law define subsistence as the "customary and traditional uses" of wild resources for food, clothing, fuel, transportation, construction, art,
management bodies will allow for the development of regulations that help maintain stock integrity while aligning more closely with customary and traditional practices and user interests. Such alignment can help reduce barriers to cooperation in harvest assessment by user groups and lead to more appropriate and practicable management decisions.

The Research Project and Setting

The research project on which this paper is based, carried out in 2002 and 2003, addresses the historical and contemporary use patterns of Chilkat River salmon by both Native and non-Native residents of the upper Lynn Canal. The research includes two principal components developed and carried out as joint projects between the ADF&G’s Division of Subsistence and local tribal governments. The first component involved participant observation and interviewing of resource users. The primary goal of this effort—the focus of this thesis—was to identify issues and barriers related to the collection of harvest data for this fishery, as well as to elicit suggestions for future harvest assessment efforts. The second component involved door-to-door, confidential surveys about the levels and areas of subsistence salmon harvest in the general area. The data collected in this part of the study will be compared with harvest data collected in the standard manner by the Department of Fish and Game in order to better understand the integrity of the numbers currently used in making management decisions. This research is one aspect of cooperative statewide efforts to improve harvest assessment for subsistence fisheries (Subsistence Fisheries Harvest Assessment Working Group 2000).

The Haines Borough area, whose residents are the primary focus of this research, includes crafts, sharing, and customary trade. The phrase is also often preferred by harvesters over the significantly connotated word “subsistence” used for the harvest category in regulatory and legal documents. Information included in this paper was collected using standard ethnographic interview and participant observation techniques, as well as through reviews of pertinent academic, historical, and regulatory documents. The Alaska Department of Fish and Game currently collects annual harvest data for this fishery from returned subsistence fishing permits.
a large land area around the Chilkat and Chilkoot river systems in northern Southeast Alaska (see Appendix A). Residents of the area are concentrated in several communities and spread out along the road system. The Chilkat River flows down a wide valley from the Yukon Territory to the waters of Chilkat Inlet in Southeast Alaska’s upper Lynn Canal; just to the east are the Chilkoot River and Chilkoot Lake. Both river systems are exceptionally productive fish harvest areas. Of particular value is the sockeye salmon, an oily and highly prized fish that comprises the majority of the commercial and subsistence salmon harvests on these rivers.

The village of Klukwan is located on the north bank of the Chilkat River, approximately 22 miles from the river mouth. Unlike the neighboring community of Haines, Klukwan has not developed significant marketable services. Historically, however, its proximity to Haines has provided access to employment with schools and the Presbyterian mission, as well as in commercial fisheries and cannery operations. Completion of the Haines Highway in 1942 further connected Klukwan with Haines and the Alaskan and Canadian Interior by road, resulting in increased wage employment in a variety of fields. As of the 2000 census (United States Census Bureau 2000), the village of Klukwan had approximately 139 residents, of whom 123, or 88.5%, identify themselves as part or all Alaska Native. Residents are currently employed in the logging, tourism, transportation, commercial fishing, and government sectors, and by Klukwan, Inc., the local Native corporation. Subsistence harvests still provide significant contributions to nutritional, ceremonial, and cultural needs of the community (Alaska Department of Fish and Game 1987 and 1996).

The Haines Borough encompasses the communities of Haines, Covenant Life, Lutak, and Mosquito Lake, as well as households along the Haines Highway. As reported in the 2000 census, the borough was home to 2,392 people (United States Census Bureau 2000). Although the population of Haines is majority non-Native, a large number of Chilkoot Tlingit and Native residents with ties to Klukwan live in the town. The numerous familial and other connections
between Klukwan and Haines manifest in cooperative harvest activity, reciprocal distribution of subsistence harvest, and social interaction between members of the two communities and those living along the road system. Historically, Haines residents have been extensively involved in natural resource extraction industries, as well as employment related to the mission and schools. Residents are currently involved in a variety of industries, including commercial fishing, tourism, and fine arts. While the average rate of subsistence harvest by those living in Haines is less than that found among Klukwan residents, many families do participate extensively in the harvest of game and fish, with a high rate of dependence on salmon resources, particularly among Native residents.

Native residents have the longest tenure of both resource use and residency in the upper Lynn Canal area. The Tlingit were the first known residents, having migrated from both the south and the Interior to the drainages of the Chilkat and Chilkoot Rivers (Swanton 1908; Emmons 1916; de Laguna 1960; Sackett 1979). The Tlingit of this area are often considered to be two groups, the Chilkat and the Chilkoot, or two smaller subsections of the Chilkat Tlingit known as the Jilkat and the Jilkoot (Mills et al. 1984). The two had separate territories that included permanent villages, seasonal camps, and trade routes to the interior. In many of the older ethnographic accounts, however, the two groups are listed simply as the Chilkat, whose territory covers most of the northern Lynn Canal region and extends into the interior (de Laguna 1972; Goldschmidt and Haas 1998).

Klukwan, the largest of the Chilkat communities, was also the wealthiest (Krause 1956), and the Chilkat Tlingit were considered to be one of the most powerful and successful groups in Southeast Alaska (Hyde 1886; Krause 1979; Sackett 1979). Following the depopulation of Chilkoot villages in the late 18th century as a result of disease outbreaks, economic changes, and a devastating landslide (Mishler and Holmes 1986), many of the remaining Chilkoot settled in the Haines area. Currently, both the Chilkat and the Chilkoot are federally recognized tribes,
headquartered in Klukwan and Haines, respectively.

Like other Tlingit, the Chilkat and Chilkoot had access to a wide variety of resources in their home territory, but those along the Chilkat and Chilkoot Rivers also enjoyed proximity to the resources of the Interior. The unique alluvial fan conditions found on the Chilkat River around Klukwan also allowed for harvest of salmon and other fish throughout much of the year; the upwelling of warm water from the alluvial fan provides favorable salmon spawning habitat and an exceptionally long migration and harvest season for several species.

The Chilkat Tlingit participated in an extensive system of exchange with both Interior and coastal peoples (Oswalt 1978). The exchange of eulachon oil was a particularly significant trade activity, and the Chilkat created and used a portion of the network of “grease trails” along which eulachon oil was carried into the Interior. Beginning in the late 18th century, there was extensive contact between the local Tlingit and European explorers, missionaries, and traders (Innokentii 1993; Rogers 1960; La Parouse 1968). Trade in western goods along the grease trails became widespread (Sackett 1979). The Chilkat had rights to and rigorously controlled several of the major trade routes (Oswalt 1978; Krieger 1927), but experienced decreasing control over and benefit from these routes during and following the Gold Rush period (Muir 1993). Significant settlement of the area by non-Native residents began when a mission was established at the mouth of the Chilkat River in 1881. As the mission settlement grew and there was an increase in industries such as mining, canneries, and logging, numerous non-Native settlers joined the Tlingit residents.

**The Chilkat River Subsistence Salmon Fishery**

Subsistence fisheries in the State of Alaska occur under a specific harvest category that is intended to provide an opportunity for community members to obtain food for their own consumption. The harvest category also allows for a limited amount of traditional trade of
harvested items. The open season for subsistence harvest of Chilkat River salmon stocks is approximately June through October, with short in-season closures and area restrictions based on conservation concerns, as well as season extensions in the event of healthy runs. Current subsistence harvesters are both Native and non-Native, with the local Chilkat and Chilkoot Tlingit having the longest tenure of local residence and involvement with the fishery. Although the harvest on the Chilkat River is open to all residents of Alaska, harvest is conducted primarily by residents of Haines and Klukwan and by those with familial or other close ties to these communities. Although it is regulation of customary and traditional Tlingit fishing methods that is the primary focus of this paper, I will also discuss several significant issues related to regulation and under-reporting of harvest as a result of disagreements over regulation between management bodies and both Native and non-Native users.

In response to the changing availability of salmon, involvement in wage labor, and regulations imposed under state management, the season and pattern of harvest among Native users has changed from that observed by Oberg (1973) in the early part of the century, as have the gear types used. Many of these changes have occurred within the lifetimes of older village residents. Employment in the many local commercial fisheries and cannery operations, beginning in the late 19th century, was widespread among residents of the Haines and Klukwan area, and particularly among Native residents (Cooley 1953). Cannery operations in the area, as in other parts of the state, had a considerable effect on the abundance of fish stocks, as well as on subsistence harvest patterns (Price 1990). Concentrated fishing efforts for cannery operations, as well as a transition to using traps to harvest salmon, led to the decline of many salmon runs around Southeast Alaska (Price 1990); similar effects were seen on the Chilkat and Chilkoot (Tingle 1896). Altered patterns of harvest and processing continued well into the 20th century and corresponded with Native participation in other commercial fisheries. Although there has historically been a high rate of Native participation in area commercial fisheries, a combination of
economic factors has resulted in a recent decline in both Native participation and activity in the commercial fishery in general.

In 1908, a basic road was built along the Chilkat and Klehini Rivers from Haines nearly to the Canadian border. Lands along the road and the banks of the rivers were developed by homesteaders and other settlers, both Native and non-Native. These newcomers, and the many who followed, joined long-term residents as subsistence or "personal use" harvesters of the rivers' fish. Both Native and non-Native residents of the area now participate extensively in home use fisheries; the result is a subsistence harvest that differs considerably from historical patterns in demographic and geographic distribution, as well as other features.

In recent years, some of the most significant changes in subsistence activity on the river have occurred as a result of changing land ownership patterns along the river, and particularly as a result of the establishment of the Alaska Chilkat Bald Eagle Preserve, which encompasses 48,000 acres of the Chilkat River Valley. The preserve, the final result of contentious efforts to create protected areas in the valley (Menke 1997; Ross 2001), was established in 1982 by the State of Alaska to "perpetuate the world's largest concentration of Bald Eagles and their critical habitat" (Department of Natural Resources), as well as to protect salmon habitat and stocks in the Chilkat River system. According to the Alaska Division of Parks and Outdoor Recreation, the preserve also "allows for traditional uses provided such uses do not adversely affect preserve resources" (Alaska Department of Natural Resources). The Alaska Division of Parks and Outdoor Recreation manages the preserve and is assisted by the Alaska Chilkat Bald Eagle Preserve Advisory Council, which represents diverse community and management interests.

The initial objection of Klukwan to the establishment of the eagle preserve related to perceived violation of land claims and rights. A primary concern was that traditional harvest activities would be restricted within the preserve boundaries or affected by other preserve uses. The multi-party agreement that formed the basis for the final law establishing the preserve
recognized that local residents have “certain prescriptive and traditional rights to use the preserve in its entirety” and that “[h]unting fishing, trapping, berry picking, and woodcutting are a few of these rights that are protected by law within the preserve” (Menke 1997). There remain, however, ongoing and conflicting local pressures regarding the respective prioritisation of economically beneficial tourism activities on the river and the culturally and economically valued subsistence fishing activity. Despite allowances for subsistence harvest and the legal protections afforded traditional uses in the preserve language, subsistence harvesters and their representatives have registered a number of objections to the influence of several other preserve uses, as well as encouraged planning processes and research related to the potential impacts of these activities. The primary concern is that other uses may have a direct impact on both reproduction and survival of fish through habitat degradation and on the ability of harvesters to carry out subsistence activities. Additionally, complexity in management considerations arises from the fact that while planning for and managing most activity on the river, as well as protecting habitat, is a responsibility of the Alaska Division of Parks and Outdoor Recreation, management of harvest itself lies with the Alaska Department of Fish and Game.

As in protected areas planning processes around the world, questions regarding the interactions between different user groups in the Chilkat Bald Eagle Preserve have influenced the development of management policy for the local area. In recent years, considerable attention has been devoted to discussions about the prioritisation of subsistence, traditional, or other local uses of protected areas and the economic, ecological, and cultural implications of such prioritisation (Stevens and De Lacy 1997; Kemf and Hillary 1993; Brownrigg 1982). In addition, issues related to the development of ecotourism and cultural tourism enterprises have a role to play in determining how potentially conflicting uses of the river’s space and resources are managed (Tisdell 2001). In this case, significant change to subsistence use patterns has occurred not only
as a result of lands being in protected area status, but also as a result of decreased access through state forest land and privatisation of land along local river systems.

**Subsistence Harvesting in Alaska**

Statewide, cash economy and subsistence activities, as well as the politics that surround them, have been significantly influenced by the Alaska Native Claims Settlement Act (ANCSA), a 1971 federal act intended to settle aboriginal land claims in Alaska by establishing regional and local Native corporations around the state. Under ANCSA, the newly created corporations received both 44 million acres of land and $962.5 million in exchange for extinguishment of land claims. The resources available on selected lands have been a significant factor in determining the financial successes of corporations and associated shareholder distributions. The economy of Klukwan has been substantially affected by ANCSA (Brown 1996); Haines, despite not having its own village corporation, has also been affected due to kinship ties and cross-residency with Klukwan, as well as residents' participation in Sealaska, the regional native corporation. ANCSA was intended to mediate for the effects on subsistence and other traditional uses of development activities around the state. The suitability of the act's structure and implementation has been widely debated and its impacts, both negative and positive, have been the source of much interest and contention (e.g., Berger 1985; Jorgensen 1995; Bigjim 1974; Cornwall and McBeath 1982; Brown et al. 1998; Dombrowski 2001). What is rarely questioned, however, is the significant impact ANCSA continues to have on subsistence policy in Alaska. In exchange for the settlement establishing corporations, ANCSA extinguished aboriginal rights of preferential access to fish and game resources in the state. Congress and Native groups approved the act with the expectation that later federal efforts would address the issue of subsistence access. This intention was expressed by the ANCSA Conference Committee during the original ANCSA discussions, for which the Conference Report stated that the committee “expects both the Secretary [of the
Interior] and the state to take any action necessary to protect the subsistence needs of the Natives” (92nd Congress 1971).

The Alaska National Interest Lands Conservation Act (ANILCA) of 1980 was primarily intended to establish protected areas in Alaska. ANILCA was also, however, used as a tool for resolution of subsistence access issues: the act included wording that addressed the interest of Congress in perpetuating Native subsistence practices in Alaska. Title VIII of ANILCA established a subsistence preference for rural Alaskans, but did not limit this preference to Native residents. This preference applied to all federal lands in the state, a significant portion of the state land base.

State law, based on a constitution that mandates equal access to resources for all state residents, cannot be brought into compliance with this federal requirement without passage of a state constitutional amendment. To date, Native representatives, various interest groups, and the legislative and administrative branches of the state government have been unable to reach an agreement that would result in such an amendment. Since passage of ANILCA, numerous legal suits, including the fisheries-related “Katie John case” (Katie John, et al. v. United States), have been brought in efforts to bring the state into compliance with Title VIII by establishing a rural subsistence preference. As a result, the federal government stepped in to manage game allocations on all federal lands and, in October 1999, to establish management of fisheries. Fisheries that are now subject to takeover by federal managers include all those that occur in navigable waters that run through or are adjacent to federal lands. In addition, federal management agencies have the authority to initiate management of fisheries on all stocks that use these navigable waters, including migratory species, in the event that conservation concerns or subsistence uses may be threatened by other consumptive uses. Currently, federal fisheries management for subsistence fisheries is in place on all the federal navigable waters, as well as some marine waters around the state.
Both Alaska state law (AS 16.05.258) and federal management systems prioritize subsistence among consumptive uses of fish and wildlife, but these considerations come into play only when stocks are insufficient in number to meet both conservation needs and a range of use requirements. In times of shortage, both state and federal management regimes are required to first consider and provide for sufficient return and reproduction of stocks. The secondary preference is for subsistence needs, which must be met before the demands of other consumptive uses, such as commercial and sport fishing. In areas under federal jurisdiction, managers are mandated only to protect for conservation and subsistence; a potential or perceived threat to either can be cause for discontinuing all other uses.

The state government, by policy and with a greater economic interest in the success of commercial and other fisheries, takes a slightly different approach. After determining that a fish or game stock is sufficient to sustain harvest, the relevant board (the Board of Fisheries or the Board of Game) consults a variety of resources and establishes a number that is "reasonably necessary for subsistence uses" (AS 16.05.258(b)). The board then creates regulations that allow for a "reasonable opportunity for subsistence uses of those stocks or populations," and prioritizes this over other uses (AS 16.05.258(b)(1)(A)). The differences between the state and federal systems and the patchwork of jurisdictional and enforcement areas around the state can cause considerable difficulties for resource users and have contributed to a changing climate of fisheries management in the state.

Although subsistence users of Alaska’s fish and game resources, both Native and non-Native, already participate in management decisions to a significant extent, the way this transfer of power from state to federal agencies is being approached, in addition to an increased focus in the state on self-governance and recognition of tribal governments, has the potential to further increase the role of subsistence users and the prioritization of their uses. This potential shifting balance of power provides an additional incentive to expand efforts to bring user group
knowledge and participation to the foreground in management decision making. In anticipation of the anticipated changes in approaches to management, Alaskan communities are stepping up efforts to facilitate their increased participation and expand their influence in determining the future of resource management in the state.

Similar efforts to increase local participation in relation to a variety of resource uses have been reported in academic and applied research conducted in several fields of study. There is a significant body of research related to the integration of traditional/local ecological knowledge with scientific research and management (e.g., Berkes and Folke 1998; Neis and Felt 2000; Sallenave 1994; Merculieff 1993), and to efforts to create and maintain co-operative management among resource users, policy makers, and researchers (e.g., Pinkerton 1989; Usher 1993; Kofinas 1993; Nadasdy 1999). Research and practice in these areas continue to attract both interest and effort and have helped create a political atmosphere in which user groups are experiencing increasing support for their attempts to incorporate local knowledge and management structures. This change is taking place within a more general setting of increased emphasis on indigenous people’s efforts for self-determination, particularly in relation to natural resources (Schweitzer et al. 2000; Clow and Sutton 2001).

In this particular instance, the current fisheries management setting in the State of Alaska has been an important impetus for this research and the hoped-for success of its application. Surrounding the Chilkat River is a patchwork of state, federal, and private land, with the directly adjoining land primarily in State Forest or Protected Area status (see Appendices A and B). This land ownership status, shared by the Chilkoot River, makes these rivers unique among those in Southeast Alaska, as management of their fisheries will probably remain entirely under state control. The ongoing transition from state to largely federal management of subsistence fisheries, although not likely to directly affect activities on the Chilkat River because of land ownership status, has set the stage for subsistence users to exert significant pressure on managers to prioritize
subsistence uses. The current political atmosphere also encourages increasing involvement in management by subsistence user groups. This transition in management and the general political and economic power of subsistence users in the area have been shaped by the state’s historical perspectives on resource management and the extensive tradition of subsistence fisheries use in the upper Lynn Canal, as well as by ANCSA, ANILCA, and other federal acts created and applied in the past 30 years (Mills 1982; Wolfe and Walker 1986; Bosworth 1991; Loescher 1999). In relation to harvest assessment efforts, this current environment encourages a management regime that appropriately documents and provides for sufficient subsistence harvest in terms of both quantity and the nature of harvest.

**Historical and Contemporary Subsistence Salmon Harvest on the Chilkat River**

The Chilkat River system provides spawning and rearing grounds for six species of Pacific salmon, as well as trout, Dolly Varden, and eulachon, a type of smelt highly valued for its oil. Seasonal fish camps were historically located along the banks of the river and were used for the harvest and processing of eulachon, as well as the harvest and preliminary processing of several salmon species. These camps were used by extended family units for fish harvesting and as jumping-off points for hunting, gathering, berrying, and trading forays.

The gear historically used for harvesting salmon in Southeast Alaska included spears, harpoons, gaffs, nets, traps, weirs, hook and line, gigs, and fishwheels (Krause 1979; Oberg 1973; de Laguna 1972; Stewart 1994; Betts 1992; Wolfe 1989). All of these gear types were recorded as being used for fishing in the Chilkat River, although there was a particular emphasis on spears, harpoons, gaffs and, in the later years, nets. Several types of spears and harpoons were used in the Chilkat River system, particularly to harvest king salmon (Betts n.d.; Oberg 1973). Weirs and basket traps were also used to harvest both sockeye and king salmon, although these were later
replaced by nets and other methods. Gear types were selected based on their suitability for specific river conditions, species of salmon harvested, or life stage of the targeted salmon.

During his time in Klukwan in 1931-32, Oberg (1973) observed that local residents ate fresh most of what they collected in June and July and collected and ate fresh salmon eggs during this time. Surviving local residents, however, recall fishing for salmon continually from the return of the eulachon in May through the winter coho runs. In August, salmon eggs were also collected to be stored with berries and eulachon oil. Niblack (1970) recorded that the Tlingit collected salmon roe both from fresh water and from harvested female salmon. This delicacy was dried, eaten fresh, or preserved for winter.

Beginning in September, the vast quantities of salmon needed for winter survival were caught, processed, and stored (Oberg 1973). During this time of year, most coastal Tlingit relocated to seasonal fish camps on streams owned by specific clans, where there were both living and fish-processing areas. Intense harvest and processing of salmon over the next few months allowed families to put up enough fish to last until the following spring. At the end of the season, preserved salmon in various forms was transported to the permanent village and stored.

Residents of Klukwan, located on the north bank of the Chilkat River, fished all along the river, processing salmon at camps and in the village. Klukwan harvesters, unlike those of many other Southeast villages, conducted a largely in-river harvest of salmon. Harvesting closer to the village, rather than at distant fish camps, enabled them to process a portion of their catch in the village and its smokehouses. Men were primarily responsible for harvesting fish from the rivers and their tributaries, while women cleaned, cut, and hung the fish to dry. Oberg (1973) reported that fish were both wind dried on large outdoor racks and cold smoked inside smokehouses. Most salmon was smoked or dried at fish camps, although processing sometimes began at the camps and finished at smokehouses in the village. The Chilkoot Tlingit fished both the lower reaches of the Chilkat River and the Chilkoot River and Lake. They harvested from large seasonal fish
camps along the Lutak Inlet and Chilkoot River, as well as from permanent settlements on Chilkoot Lake.

The unique water conditions found around Klukwan allowed residents to continue harvesting several species well into the winter months, as well as all along the length of the river. These conditions allowed for a fishery with much greater temporal and spatial scale than those found in most parts of Southeast Alaska. King salmon runs started in early summer and the late-season chum, sockeye, and coho often stayed in the river system through January. Harvest of fish during these times was primarily by gaff, spear, or harpoon, as these gear types allowed fishers to select the fish most desired for a particular product or in the best shape for immediate consumption. These late salmon were used for a variety of products, including being eaten fresh and for “winter fish,” a frozen and slightly fermented fish. Nets were also used under the ice to harvest coho, steelhead, and Dolly Varden. Harvest for winter fish occurred primarily in the main channel of the Chilkat River and the lower reaches of the Tsirku, adjacent to and below Klukwan. Spawned sockeye were taken from Chilkat and Mosquito Lakes and from a tributary of the Chilkat River located at 14-mile along the river. Coho and chum were harvested from the mainstem of the Chilkat and from the Klehini River drainage.

Throughout Southeast Alaska, salmon continue to be a staple of subsistence harvest. In the Chilkat River, the species commonly targeted include sockeye, chum, and pink salmon. The incidental catch of coho and king salmon in subsistence gear is legal, but discouraged by ADF&G and by the agency’s timing of the subsistence fishing season and in-season closures to protect specific stocks. Sockeye salmon are particularly valued and comprise a significant portion of fish harvested. The Chilkat River system has several distinct runs of sockeye that occur throughout the harvest season, enabling harvesters to fish over a longer period of time and intersperse fish harvest with other subsistence or wage labor activities. Subsistence harvest in this area is conducted primarily with drift and set gillnets. Contemporary subsistence sockeye harvests in
other parts of Southeast Alaska often occur in bays and the mouths of rivers, using beach seines or with commercial seining gear that is used to harvest quantities of fish for distribution and use by a group of people (Thornton et al. 1990).

Subsistence harvest of salmon on the Chilkat River occurs in the river, from its estuary to about 24 miles upriver from the mouth, as well as in the saltwater of Chilkat Inlet. The season for this subsistence fishery runs from June 1 through September 30, with specific in-season limitations and closures. The in-river fishery is open every day of this period, except during a four-week period from mid-late June to mid-late July; this closure occurred between June 24 and July 21 in the summer of 2002. During this time, the only river fishing allowed is in the area immediately adjacent to Klukwan, from approximately 22-mile to 24-mile along the river. This closure is intended to help protect king salmon as they migrate up the river by reducing incidental catch. At the discretion of the Area Management Biologist (AMB), the subsistence harvest season may be extended when fish stocks are considered healthy in any given year.

Subsistence fishing in the saltwater is allowed in areas of the Chilkat, Chilkoot, and Lutak Inlets during specific periods between June and September. Timing of the saltwater harvest in this fishery is related to weekly commercial openings for the upper Lynn Canal driftnet salmon fishery. The subsistence saltwater fishery opens at 12:01 AM on the day preceding the beginning of the commercial opening and closes at the same time as the commercial opening. In a normal week, this subsistence opening runs from 12:01 AM on Saturday to 12:00 PM on the following Wednesday, although extensions in the commercial opening are reflected in extensions of the subsistence opening.

In the contemporary Chilkat River subsistence salmon fisheries, several gear types are used. Each gear type is suited to a particular set of river and run conditions and the targeted species, as well as to the needs and available resources of the harvester and his network. Due to regulatory restrictions, the primary differences in gear type are related to whether harvest occurs
in fresh or salt water (5 AAC 01.720). In the saltwater fishery, drift gillnets are the only allowed gear type. These nets must not exceed 50 fathoms, or 300 feet, in length. Driftnets can also be used in the river fishery, but must not exceed 50 feet when fished in fresh water. Neither the freshwater nor the saltwater fishery allows use of rod and reel, spears, or gaffs as harvest gear. The required subsistence salmon harvest permit issued by ADF&G states that coho and chinook salmon, as well as trout and char, may be taken incidentally with subsistence gear, but requests that unharmed king salmon be released whenever possible.

The majority of Klukwan residents fish with set gillnets that are placed in the river in front of the village, often directly in front of the fisher’s house, processing facilities, and/or smokehouse that will be used. This allows harvesters to keep an eye on nets, quickly and efficiently move fish from river to processing facilities, and fish during the closure that applies to the rest of the river. Many families have access to the proper nets, boats, and fuel for river fishing and fish within family groups, although people are often willing to lend out boats and/or gear to neighbors and friends. Those borrowing the gear often compensate the lender with fish or other foods, or by lending back necessary gear when needed. Fishing in the river does not require a large harvesting group; often just one individual puts in and pulls out the net, or this is done by a small number of related individuals or friends.

Haines residents often harvest in similar groups, but their activity, particularly among non-Native participants, occurs primarily in the saltwater, estuarine, and lower reaches of the river. Haines residents with close family, historical, or other ties to Klukwan often fish in or near the village; many Native residents of Haines demonstrate harvest, processing, and distribution patterns that are geographically and practically similar to those of Klukwan residents.

Fishers use commercial gillnets that have been cut down and made both shorter and shallower to be the proper size for river fishing. The cork line and lead line are also from commercial nets, while hanging twine can be obtained from a company in town. The river nets
are usually made from used commercial nets donated or sold by commercial fishermen; one commercial net can be made into several nets for river fishing. When used in the river, these set nets are anchored to a spike, tree, rock, or other fixed object on or near the bank or are tied off onto a “dog,” a metal spike with a ring that is driven into a stump or tree. When choosing a place to put a set net, harvesters look for deep holes with a back eddy along the bank. The net is stretched from the bank out across the downstream part of the eddy, where it is held in place by the back current.

Some harvesters also use drift nets in the river, either exclusively or in certain river conditions. Drifting nets can be quite dangerous and costly in terms of repair, as nets can get snagged on the river bottom or other river debris, but drifting usually results in a larger harvest of fish per unit hour. Set nets may be preferred because they can be used at night and require less intensive harvester monitoring. If a harvester has the capacity to process many fish at a time, he may choose a drift net over a set net, although set nets can also be quite efficient during peaks in the run or in years with high stock returns. One significant difficulty with river fishing, with both set and drift nets, is the tendency of nets to intercept snags, leaves, and other debris in the water, making the nets visible to fish and requiring more time for net maintenance and repair.

The kinds of products made from salmon have changed somewhat over the years according to community tastes, weather patterns, and the availability of storage technology. Some products, such as fermented fish heads and preserved fish eggs, are now prepared or eaten only infrequently. Some people remember older relatives eating these products, but most never learned to make them and few eat them now. On the other hand, some community elders continue to make these products occasionally and share them with both Native and non-Native friends. Respondents emphasized that fermented fish products can be quite dangerous if prepared improperly, and that there were only a few people they trusted to know the correct way.
Respondents also remember the Haines and Klukwan area as being colder and having more snow in the past than now. The warmer temperatures and lack of snow, as well as access to electric freezers, have resulted in a transition from fish frozen in snow to those kept in the freezer for winter and spring consumption. Residents, particularly those with access to vacuum packing equipment, are also freezing more fillets and steaks than fish in the round, as was common practice when storing them in snow.

Many families in Klukwan have both drying sheds and smokehouses on their property, although these facilities, like the harvest and processing, are usually shared with extended family groups to distribute investments of money and time. Many Haines residents, both Native and non-Native, also have smokehouses or smaller smoking facilities at their homes. Families and individuals have unique approaches to preparing fish, varying brines, wood type and moisture content, type of smokehouse and drying shed, cutting techniques, and numerous other factors that affect the shape, taste, and storage properties of the final product. Those responsible for drying must also be attentive to weather conditions and humidity, as these factors have an effect on the amount of time and the temperature required for preparing smoked or dried fish. Properties of different species also help determine which products are most easily made or most desirable. Some of the most common products are smoked fish, the náayadi or half-dried fish, dry fish, and fish packed fresh in jars. Smoked fish is also sometimes packed in jars or vacuum packed.

There are numerous ways to smoke fish, including a variety of dry fish types and strips. Both sockeye and chum salmon are used for dry fish, although sockeye is more common. The low oil content of the chum makes them good for dry fish, but the taste is not considered as desirable by most. Several families also smoke king salmon, although these are often difficult to dry sufficiently due to their high oil content. Harvesters also both consume and distribute fresh fish, as well as vacuum pack or wrap and freeze filleted, steaked, or whole fish for later use.
The process of harvesting and putting up fish is commonly conducted by networks of individuals that include both harvesters and processors working together. A small group is responsible for the actual harvest and for bringing the fish back to the group responsible for processing. The harvesters are also often involved in the initial stages of cleaning the fish, and may participate in other aspects of processing such as jarring and smoking. Other members of the network may be responsible for operation of the smokehouse, cutting and jarring of both fresh and smoked fish, preparing and monitoring pressure cookers for the jarring process, preparing fish for freezing or specific products, determining the need of family members and arranging with the harvester to provide sufficient fish, transporting or arranging for transportation of fish, or any number of other specific tasks. Most networks of harvesters and processors go beyond the boundaries of immediate families, with extended families, clan relatives, those either formally or informally adopted into a family, and friends from around Alaska participating. During the fishing season, many people return to local communities to help with harvest and processing activities. The process becomes a way to reintegrate individual family members who may have moved away from the community, as well as a way to educate newcomers and younger family members in fishing and processing skills, cultural standards and history, and the importance of family networks. Throughout the process, there is considerable communality of harvest and processing activity, use of gear and harvesting technologies, and distribution of products, particularly among Native harvesters.

The resources, time, and labor required to provide and maintain fishing gear, harvest and process fish, and distribute both fresh and finished products are considerable, but are distributed among a number of people according to their availability, skills, and access to cash income. Within the group, roles often change according to involvement in wage labor, which determines access to monetary income; amount, season, and timing of labor resources available to be allocated to harvest activities; and the need to travel or relocate. Roles may also change in
response to the acquisition of new skills, access to gear related to involvement with the commercial fishing industry, loss of mobility or capacity for harvesting or processing activities, access to vehicles or boats, and/or residency. In response to these changes, the network readjusts and jobs are redistributed to ensure that necessary tasks are covered. The network functions to both determine and meet the needs for fish, providing sufficient quantities for distribution to elders, relatives in different communities, and others who are unable to participate in the fishery for a variety of reasons.

Klukwan and Haines Native harvesters distribute salmon throughout the community, as well as to friends and relatives in Haines and around Southeast Alaska, the Yukon, and the Lower 48 states. Most harvesters provide for their own immediate families, as well as for extended families. There are a few high harvesters in the community who harvest considerable numbers of salmon and distribute them to community members who haven’t received enough fish for the year. Several of these individuals involve themselves primarily with the harvest activities, each giving the fish over to designated family members who are responsible for arranging processing and distribution of the fish. Sometimes the harvester has individual recipients in mind, particularly for king salmon, but the designated distributor is often charged with identifying appropriate recipients and distributing the fish. Non-Native harvesters also frequently distribute fish to friends, family, and community members identified as needing fish or being unable to harvest for themselves.

Fish is given fresh, if the recipient has processing facilities and capacity, as well as already jarred or processed. Fish given to older family members is often processed before distribution. Within the community of Klukwan, possibly because of the close family ties, fish is often just gifted to the recipient, without expectation of an immediate trade for other products. Similar distribution occurs between some residents and their relatives throughout Southeast and in the Yukon. In other cases, and with many outsiders, processed fish, either fresh packed or
smoked, is exchanged for other products, primarily halibut and a variety of game meats such as moose, caribou, and deer that are not readily available in the village. Salmon is also exchanged for other types of fresh seafood, including shrimp, halibut, and crab, if the harvester does not have access to those foods. Respondents also have in the past or currently send fish to other communities, receiving black seaweed, seal oil, or herring eggs in return.

Harvest and processing levels and types also vary according to the ceremonial needs of the community in any given year. Memorial parties or other types of ceremonial occasions require the distribution of significant numbers of gifts and subsistence food products to guests, who often number in the hundreds. Families preparing for these occasions put up considerable stores of smoked, dried, and jarred fish in preparation, and specific products may be sought in conjunction with memorial potlatches. The need to prepare for a potlatch may significantly increase the harvest needs of an extended family in specific years and may require the participation of several households as well as more distant family and clan relatives. People operating set nets are often willing to put aside extra fish for local residents preparing for potlatches.

Management Approaches

One of the primary mandates of fisheries management is to ensure the long-term sustainability of fisheries resources. Given this constraint, managers also have an interest in providing for a maximum level of access to harvest and in sustaining harvest yields over time. Maximizing resources for all users is also a constitutional mandate for Alaskan managers. In order to achieve these two primary goals, fisheries management strives to reduce, to the extent possible, the uncertainty that is inherent in dealing with fish stocks, particularly highly migratory species such as salmon. Quantitative measurement of fish stocks, specifically of recruitment (reproduction and survival) and extraction (harvest and other causes of mortality), has historically
been the principal tool of these efforts (Cochrane 1999). The ability of managers to meet mandates for both harvest access and sustainability of populations has relied on the use of quantitative measures in making decisions about a range of factors, including appropriate harvest levels, habitat protection, and enhancement efforts.

In the case of the Chilkat River subsistence salmon fishery, the historical and regulatory setting has been functioning as a barrier to the ability of fisheries managers to execute quantitatively based management. Although local managers frequently employ various quantitative assessment tools, including oversight of the commercial fishery harvest and in-river counts of returning salmon, both they and harvesters recognize that the official assessments of subsistence salmon use in the area do not reflect actual harvest levels or activity and that decisions about subsistence harvest lack much of the robustness and in-season responsiveness found in other harvest sectors. The form and enforcement of regulations, as well as the history of relations and differing perspectives between subsistence harvesters and management bodies, discourage reporting by harvesters and, thus, decrease the accuracy of harvest data. In effect, by implementing a variety of regulations and approaches, the “State” has set itself up for failure in its efforts to manage according to the (desired) quantitative measures. The following sections will focus on a number of general and specific barriers to improving harvest assessment and discuss the potential for and desirability of striving for cooperation between state managers and subsistence harvesters in these efforts.

Barriers to and Issues Surrounding Harvest Assessment

Among the barriers to gathering accurate harvest assessment numbers identified in the course of this research were both a fundamental schism between understandings of resource valuation and management of user behavior and a set of specific barriers related to regulations for the fishery in this area. At the general level of perspectives on management, there is a dissonance
between the valuation of fish and fisheries management tools by management bodies and users, particularly in regard to the importance of quantitative assessment.

Commercial fisheries management is designed to incorporate numerous inefficiencies in the form of restricted seasons, gear types and sizes, open areas, and other factors of harvest. Without such restrictions, the individual commercial fisherman, as well as the industry as a whole, would realize increasingly larger profits as a result of increasing effort, at least in the short term. The assumed outcome in the absence of such restrictions is a classic “tragedy of the commons” (Hardin 1968). For agencies accustomed to managing for commercial fisheries—the historical norm—in which additional effort results in increasing profits with only marginal additional expense and maximizing profit is the goal of users, the value differences encountered when developing regulations for subsistence fisheries may be nearly incomprehensible.

Numerous Klukwan and Haines area residents are involved in both commercial and subsistence harvest of fisheries resources. Repeatedly, however, Native subsistence users emphasize that their subsistence harvest is limited not by regulation or market demand, but by the sustenance, ceremonial, and customary trade needs of the community and established distribution networks (e.g., Berger 1985; Hensel 1996). Subsistence foods are harvested and distributed according to the needs of individuals and households, not produced to meet the demands of diverse and widespread, even global, consumers. As the exchange of subsistence products is limited primarily to non-market transactions or to those involving only small amounts of cash used as a medium of exchange, the driving force behind production is the need and preference for specific foods, rather than the market economy. Both harvest and processing require considerable expenditure of time and resources. The harvest of subsistence foods above and beyond the sustenance, ceremonial, and customary trade needs of a community provides little marginal benefit to those involved.
User Harvest and Management Approaches

Historically, the Tlingit had a well-established system of possessory land rights throughout their territory, with ownership and responsibility for the hunting, fishing, and harvesting rights for specific locations belonging to the local units, or houses, of specific clans (Swanton 1908; Niblack 1970; Oberg 1973). These possessory rights were among the set of symbolic and material property held by these same groups and their respective leaders, known as yitsati, or “keeper of the house” (Oberg 1973, 92). Rights to use the resources of these areas extended to both local and geographically distant kin, and the yitsati was responsible for managing harvest levels and timing, as well as for overall stewardship of clan land. The system of land rights also helped maintain trade and relationship networks among clan and house groups, as well as allowing for sustainable patterns of resource use (Thornton et al. 1990). In exchange for a gift or payment, usufructuary rights for the land of one clan house were often granted to members of another house group experiencing shortages (Niblack 1970). In this way, clan houses not only strengthened allegiances among themselves, but were also able to distribute harvest pressure in order to decrease the possibility of overharvesting any one specific area. By forming such alliances, the yitsati was also able to ensure access to resources, through either trade or reciprocal harvest relationships, sufficient to meet the needs of the clan group, even during shortage on the clan’s own land.

For the Tlingit, the harvest and processing of salmon, as of other resources, was also governed by a complex of beliefs about proper relations between those of the human world and those of the animal world. While there were a number of specific rules that were followed, the primary concern was with the maintenance of respect relationships for the long-term benefit of both human users and the resource base. Salmon were believed to be much like humans, having similar social structure and cultural practices but non-human bodies. As such, they were to be afforded considerable respect, never made the object of ridicule, taunting, or harassment. One
frequently cited Kiks.ádi Tlingit legend tells of a boy who spoke poorly of some salmon that he was given to eat. For this infraction, he was taken away by the salmon people to live with them and learn their ways. The boy later returned in the form of a salmon and was caught, whereupon his mother recognized him by the copper band he wore around his neck. He was then returned to human form, becoming a shaman and leader who spread the message to his people that they must be respectful of the salmon people and their human-like ways, treating them well so that they would return to the rivers every year in the form of life-giving salmon (Swanton 1909, 301-310). Similar stories of interactions between humans and animals encouraged respectful relations and were passed down from elders to children among the many lessons of life. Low returns of salmon or other resources were also attributed to the failure of humans to adhere to proper standards of conduct in a number of areas of daily and ceremonial life (Kamenskii 1985, 48).

Native subsistence fisheries on the Chilkat River, both past and present, are guided by these principles, as well as by specific guidelines and actions. Repeatedly emphasized as both a past and present ethic is the avoidance of waste in both harvesting and processing of fish and other resources. Additionally, the size and migration timing of eulachon and salmon runs were historically monitored through in-season test fisheries on the river, with the information used to determine harvest levels and timing. Such assessments contributed to the harvesters’ understanding of the run and to their ability to regulate harvest to provide for community needs and sufficient escapement. Knowledgeable community members, primarily elders, were responsible for monitoring the runs, while the actions and influence of community members as a group ensured compliance with management decisions.

At the current time, the influence of customary rules regarding harvest and use is still quite extensive. While systems in which specific leaders were responsible for all harvest decisions have become less prevalent, the ethic of respectful and non-wasteful use remains quite strong. Similarly, the emphasis on limiting harvest to household and community needs is still an
integral component of learning, teaching, and practicing subsistence harvest. State regulations, however, have sometimes made even meeting this need an impossibility, which has led harvesters to either disregard regulations or fish the maximum time, areas, and/or gear allowed. In addition to a set of ethics used to determine harvesting behaviour, harvesters have extensive knowledge of the river, its fish, and its hydrological patterns that are constantly employed in making decisions about when, where, and how much to harvest.

Perhaps most important, subsistence users emphasize that their interest in harvest activities extends far beyond simply the acquisition of minimal sustenance (Newton and Moss 1984). The subsistence or traditional harvesting way of life has particular significance to the Native residents of Southeast Alaska, linking them with an extensive history of and contemporary participation in land tenure and use, as well as a pattern of self-governance and self-regulation.

Nelson Frank, a Sitka elder, explains:

Subsistence living, a marginal way of life to most, has no such connotation to the Native people of southeast Alaska. The relationship between the Native population and the resources of the land and the sea is so close that an entire culture is reflected. Traditional law . . . was passed down from generation to generation, intact, through repetition of legends and observance of ceremonials that were largely concerned with the use of land, water, and the resources contained therein. Subsistence living was not only a way of life, but also a life-enriching process. Conservation and perpetuation of subsistence resources was part of that life and was mandated by traditional law and custom. [in Berger 1985:54]

Many respondents similarly emphasized that subsistence is not just a set of rules or simply the act of harvesting, but a way of life. The foods themselves and the way they are harvested, processed, and distributed constitute a significant cultural activity. Herman Kitka, an elder from Sitka, stated, “Without our Native foods, we wouldn’t have our culture” (in Thornton 1998, 62). The process of harvesting, distributing, and sharing traditional foods allows individuals, families, and communities to meet obligations of reciprocity and provision for all community members, as well as to transmit significant cultural, natural, and political knowledge within and among
generations. Subsistence foods and their production promote the health of both individuals and the larger community. Participation in subsistence harvesting and use represents not just a continuation of culture, but an active reproduction and perpetuation of such.

While their cultural background differs, non-Native harvesters also have a perception of subsistence fishing that encompasses much more than food production. Non-Native rural participation in the subsistence harvest, or what Hensel (1996) calls “pothunting,” is perceived as a significant aspect of rural Alaskan life, possibly the most important facet of a lifestyle lived “off of” or “close to” the land. Exercising, asserting, and protecting the right to harvest their own food is an important personal and political action for rural residents, as well as other Alaskans. While the tenure of their ancestors in the area may be less than that of their Tlingit neighbors, non-Native residents of the upper Lynn Canal are often descendants of several resident generations or demonstrate motivations and values similar to those of previous non-Native settlers who sought to live in whole or part off a rich land. While the subsistence salmon harvest does provide a significant source of sustenance for some, the act of harvesting is also perceived as very enjoyable. Among both Native and non-Native harvesters, harvest and processing are undertaken with family and friends, establishing and maintaining significant social networks.

Perhaps most important to this discussion, management of most Alaskan fisheries has long been based on a commercial fisheries model, regardless of the harvest type being considered. This commercial fisheries perspective relies primarily on quantitative measures to determine the best course of management action, as discussed above. Fundamentally, these differences in the valuation of the fisheries resource itself result in rifts based on different understandings of benefit, maximization, and efficiency.

As is true in much of Alaska, fisheries associated with the Chilkat River are shared among commercial, sport, and subsistence fishers. As discussed previously, meeting the need for subsistence uses comes second only to meeting the escapement goals necessary to achieve sustained
yield of fish stocks, and subsistence takes precedence over other consumptive uses. Increasing involvement in the economic sector, declining fish stocks, or other factors may sometimes preclude the ability of harvesters to provide for the needs of the community. As reinforced by legal precedent (see Bobby v. State of Alaska), however, regulations should not be designed to restrict harvest unless there is a concern about the conservation of one or more targeted or incidentally caught stocks. In practice, however, it is not common for subsistence harvests to be prioritized in regulation at the expense of commercial and/or sport harvests. A combination of factors related to management perspectives and approaches, therefore, results in a perception by some harvesters that their interests, values, needs, and uses and, therefore, their participation in decision making are not respected by management bodies.

Despite these fundamental differences in valuation of the fisheries resource, however, it may be the case that, in general, the subsistence harvester communities involved are not opposed to participating in quantitative assessment efforts, provided that their interests and input are given legitimate consideration and authority and that, as both law and the current political climate mandate, their uses are prioritized over those of other user groups. In addition, many subsistence harvesters recognize that, in the event of salmon stock declines that result in harvest restrictions, it will be in their best interest to have previously established a record of their harvest needs.

Regulatory Barriers to Harvest Assessment

Additional and more specific barriers to accurate harvest assessment efforts are the result of regulatory decisions that have failed to recognize customary and traditional patterns of subsistence harvest and distribution. One of the primary concerns among subsistence harvesters is that the current regulations do not reflect traditions relating to communal harvesting practices and the distribution of fish within communities. Klukwan and Haines are comprised of residents from several generations who are involved to varying degrees in cash and subsistence economies.
Availability of time for subsistence activities, access to the resources and facilities needed for harvest and processing, and desire or need for subsistence foods also vary among community members. To provide for the needs of the community, some households and individuals specialize in the harvest and/or processing of salmon, distributing to other households and individuals according to family affiliation and need (see Alaska Department of Fish and Game 1987). The historical roots of this type of distribution system are significant, and help explain some of the resistance to current subsistence regulations and the permit system.

Regulations regarding subsistence salmon harvest on the Chilkat River have changed over time, but have never entirely reflected the concentration of harvest in relatively few households and the associated complex and far-reaching distribution networks. The local pattern of harvest and distribution, in which a relatively small number of households provide for the entire community, not only closely resembles that found in other mixed-economy communities around Alaska (Wolfe 1987), but also clearly illustrates the importance of high harvesting households in providing subsistence foods. In addition, the imposition of a harvest limit, and particularly one as low as that existing in regulation and applied equally to all households, is problematic for many Native harvesters.

Currently, each household in the research area can apply for its own subsistence fishing permit, with each permit having a limit of 50 salmon. The use of a per-household limit reflects neither the customary practice of harvest and distribution nor its basis in the cultural values of sharing and reciprocity. Many individuals and households also interpret the listed harvest limit as an annual per-household limit. In fact, however, the permit language is somewhat unclear and previous years' regulations have varied among household, permit, and individual limits, often listing two types of limits on one permit. In the recent past, the Haines ADF&G office has allowed individuals or household representatives to return for an additional permit after they have filled the quota of 50 fish on their previously issued permit. The limit of 50 fish is, then, a permit
limit rather than a household or season limit. This change was made by the Area Management Biologist (AMB) to encourage more accurate reporting, but the success of this effort is unknown.

The renewal of permits can be a time-consuming and difficult process, as only one permit is issued to an individual at a time and residents of Klukwan can obtain renewal permits only from the Haines ADF&G office, an hour round-trip by car. Harvesters who were declined a second permit one or more times due to concerns over run size are less interested in pursuing this option in following years, and may simply continue to harvest without reporting their take above permit levels.

The State’s proxy permit regulations are quite limiting, which may also conflict with the customary use pattern. In contrast to the federal designated harvester program, which allows any federally qualified subsistence user to harvest for any other, eligibility for the state program is limited to state residents who are disabled, blind, or over the age of 65. A permit can be obtained by the “beneficiary” and fished by a designated proxy harvester, but this individual can carry only his own permit and that of one other person at any given time. In a system that relies on high harvesters and the of distribution of their take to meet community needs, use of a broader proxy harvest system may be the most efficient way for a high harvester to provide fish for one sector of the population that uses, but does not fish for, subsistence salmon. In addition, applying a single harvest limit to all households and maintaining the same harvest limit from year to year does not take into account differential use levels and preferences among households or the economic or ceremonial needs that vary from year to year (see Alaska Department of Fish and Game 1987 and 1996).

The subsistence fishery in this area is notable for the high rate of non-Native participation, and for the different perspectives on the fishery from the range of participants. On average, the Haines ADF&G office issues close to 500 subsistence salmon fishing permits per year, always more than the number of Native households in the area. While many non-Native households do
not participate in such an extensive distribution network, sharing of both harvest activity and the harvest itself among friends and family is still common. Many non-Native harvesters consider the quota of salmon allowed under the subsistence harvest permit sufficient to meet their annual needs. There are a number, however, who question whether 50 fish is sufficient for either their own households or those of others in the community, particularly those with modest cash incomes or more members to feed.

Of particular concern, too, are the ways in which current regulations have placed what are perceived by harvesters to be overly restrictive constraints on gear type, targeted species, seasons, and harvest locations. In relation to gear restrictions, many Native harvesters object to the prohibition against the use of gaffs in the subsistence fishery. While most fishing in both estuarine and in-river locations is conducted with fixed or drifting gill nets, gaff hooks were traditionally used to selectively harvest fish for a range of specific products (Betts n.d.; Oberg 1973). The establishment of subsistence fishing regulations that came with Statehood and changes in these regulations over the years have resulted in shifting harvest patterns in terms of gear types. Currently, the restrictions placed on gear type are among the primary concerns of local harvesters about management of the Chilkat River fisheries. Despite the documented customary and traditional use of gaffs and spears on this river, neither gear type is currently legal for use in this subsistence fishery, and the use of gaffs has been actively discouraged by ADF&G since the 1970s.

Several issues that also arise repeatedly are the length and timing of open seasons, restrictions on what species can be targeted, and the restriction of fishing to certain sections of the watershed. Historically, fish were harvested throughout the river system and during most of the year. All species of salmon were harvested and were used for a variety of fresh and preserved food products. From 1989 to 2002, regulations restricted the catch of chinook and coho salmon in the area’s subsistence fishery to those caught and killed “incidentally” with subsistence nets. In 2002, the targeted harvest of these two species on the Chilkat River was prohibited by both
regulation and permit language. This was the case despite the fact that both species are legally targeted in local sport and commercial fisheries. In most years, the subsistence salmon fishery officially closes in late September, which corresponds with the beginning stages of coho migration into the river and is prior to the season of most effort in the historical coho harvest. Limits placed on seasons and areas open to fishing are also perceived as greatly restrictive for an area that was once freely fished year round.

The permit itself (Alaska Department of Fish and Game 2002) (Appendix C) illustrates the ways in which the form and application of regulation can lead to inaccurate harvest data. The permit lists the regulations relevant to this fishery, including harvest limits and allowed gear types, and requires those applying for a permit to list their names and contact information. At the end of the season, after having recorded the number of fish harvested and gear types used, the permit holder is required to return the permit, which then links individual identity and harvest practices in physical form. While this information is not officially transmitted to the enforcement branch, the history of contentious and negative interactions between local residents and ADF&G, and with enforcement officers, inclines individuals to be cautious when reporting harvests above the limit or of species or with gear in violation of regulations. Additionally, the inconvenience of recording based on features of the form itself, such as insufficient space or the lack of a daily calendar, may serve as a barrier to accurate reporting.

User Group Responses to Regulation

By not reflecting customary and traditional harvesting patterns, state harvest regulations have alienated resource users and escalated already poor relations between users and state management and enforcement agencies, leading to non-participation in harvest reporting. Uncertainty in reporting accuracy is compounded by the fact that many individuals object on principle to state regulation of traditional subsistence practices and to the associated requirement to obtain a permit. Consequently,
it is possible that not all harvesters obtain and/or return permits on an annual basis, and it is also likely that not all permitees accurately report catch numbers, locations, and gear.

In addition to the difficulties in harvest assessment that are a result of permit and harvest limits, there are a number of regulatory issues that create barriers to accurate reporting of harvest levels. The regulations are, in many cases, in opposition to customary and traditional practices of harvest, processing, and distribution of Chilkat River salmon. The importance to Native communities of putting up subsistence foods is inextricably linked to cultural values and practices, nutritional needs, and issues of sovereignty and participation in management decisions. The subsistence fishery is also a significant cultural and sustenance activity among non-Native harvesters. Many participants in subsistence harvests, both Native and non-Native, fundamentally believe in access to subsistence as a right, not just a privilege afforded by the government. People who are prevented from exercising customary practices and what are perceived as inalienable harvest rights, or who continue to do so in violation of the law, are less inclined to participate fully in harvest reporting.

In many cases, resistance to regulation of subsistence salmon harvest is not a public, active movement such as that often discussed in the academic literature about regulatory resistance (e.g., Guha 1989; Varese 1996; Ross 2001; Magnusson and Shaw 2003). Instead, harvesters engage in a kind of “passive resistance”\(^4\) (Scott 1985: 31-34) by simply continuing to harvest and distribute fish according to internal cultural rules and individual or communal decisions. A history of fines and tickets issued by enforcement officers for a variety of infractions related to gear, season, and locations of fishing—although infrequent—illustrates that this response is occurring among Chilkat River harvesters. Subsistence harvesters do not necessarily perceive such actions as “lawless” or illegal—they are simply exercising what they perceive to be

\(^4\) Passive or what Scott (1985) terms “everyday” resistance can be understood as “passive noncompliance, subtle sabotage, evasion, and deception” (Scott 1985: 31).
an inherent right to provide for family and community, as well as to assert and perpetuate culture. Berger (1985) found this to be the case in his discussions with Native subsistence users around the state:

Alaska Natives are not prepared to give up their way of life merely because the federal government or the state has passed an unwelcome law or regulation. When a law stands between the Natives and their resources, when it does not take basic economic realities into account, when it conflicts with Native principles or beliefs, compliance with the law is low. Natives do not regard such non-compliance as lawlessness; they regard it as adherence to their own cultural traditions. [Berger 1985:65]

Parallels can be found in other resource management settings in which both a local and an externally imposed set of regulations and decision-making paradigms exist in opposition (Klooster 2000; Guha 1989). Acts of resistance can be seen as part of the greater efforts of a community to counter the alienation of resources and management authority by asserting its own “moral economy,” rather than imposed regulation, as a source for determining proper relations and interactions among people, resources, and concepts of property (Klooster 2000; Scott 1985; Peluso 1996; Thompson 1991). Violation of this moral economy by the state in setting and enforcing regulation contrary to customary practice reveals to user groups the fundamental inadequacy and amorality of centralized resource management, solidifying resistance attitudes and associated behaviors. Accordingly, effective enforcement by the state accordingly requires ever-increasing levels of control.

These interactions ultimately result in an iterative process that destroys trust, decreases collective knowledge about resource use and monitoring, and, ultimately, undermines the achievement of conservation, subsistence, economic, self-governance, and other goals. As is the case with forest resources in Klooster’s (2000) example and in a variety of resource management settings cited by the World Bank (Klooster 2000), the inability of managers to effectively enforce imposed, rather than locally developed, regulations indicates that a move toward more
cooperative management arrangements may better serve a number of goals, including planning for sustainable resource use.

The experience in other subsistence harvest situations in Alaska also suggests that, within the legally mandated set of regulations, selective enforcement or oversight by management and enforcement bodies occurs, with decisions about enforcement based on the feasibility of or necessity for pursuing specific regulatory measures (Gay 2003). In one recent case, federal subsistence bird hunting regulations were changed to more closely reflect customary practices, which had persisted despite contradiction with official laws:

Mike Rearden, manager of the Bethel-based Yukon Delta National Wildlife Refuge, which supports the largest subsistence harvest of migratory birds in the state, considers the treaty amendments a welcome relief.

"There's always this background of resentment that the government doesn't recognize the subsistence use that's a tradition here," he said. "It's going to make everybody's life easier to remove that tension." [Gay 2003]

In some cases, then, improved relations may result from the removal of regulations 1) that are known to be unsuited to the customary use patterns, 2) that are already known to be only selectively followed and enforced, and 3) the removal or alteration of which is not a threat to conservation concerns. In establishing the Chalkyitsik Community Harvest Program for moose, the Alaska Department of Fish and Game (2000) recognized that such harvest quota systems “accommodate traditional hunting methods and increase regulation compliance and harvest reporting.”

Conclusion and Recommendations

The objective of this research was not only to add to the knowledge base about subsistence practices, but also to identify potential improvements in harvest assessment. Both harvesters and the relevant management bodies realize that the harvest numbers currently used in management models, which are obtained from returned harvest permits, are inaccurate. The current method of harvest assessment on the Chilkat River, inextricably linked to countervailing
regulatory structures that result in inaccurate reporting, sets a dangerous precedent for use in a management scheme that relies so heavily on quantitative measures to produce decisions about a shared resource base. The inaccurate documentation of actual need and use may also cause concern among harvesters that their uses may be further restricted in the event of a stock crisis, possibly exposing them to greater legal and economic pressures. In response to these concerns, this research has identified a number of possible avenues for improving the accuracy of harvest assessment and, therefore, management of salmon stocks on the Chilkat River.

More accurate and complete harvest information may result from the door-to-door post-season harvest surveys, in which confidentiality is guaranteed and an annual, rather than per-permit, household harvest number is recorded. These types of surveys are, however, quite expensive and somewhat time-consuming to conduct in each community each year. In areas where there are no conservation concerns related to salmon stocks, more accurate self-reporting may occur as a result of instituting permit regulations, distributions, and harvest limits that are more closely aligned with community practices. In this example of the Chilkat River subsistence salmon fishery, such steps would need to include recognizing and permitting specific gear types, as well as establishing harvest limits that more accurately reflect the allocation of salmon harvest and distribution. These steps may, in the long run, create regulations that are more in line with legal requirements, as well as result in improved relations between harvesters and managers that may ultimately improve the management setting.

Options that have been explored in other Alaskan communities for a variety of resources include establishing community, rather than individual or per-permit, harvest quotas and more comprehensive regulations relating to proxy hunting and fishing, facilitating practices that may

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5 A community harvest program generally sets a harvest quota for a community, allowing a small number of people to harvest for distribution to all interested community members. This type of harvest is often more suited to subsistence hunting and fishing patterns than are individual bag limits. Community harvest programs exist in Alaska for a variety of resources, including wildlife, fish, and marine mammals.
better reflect local systems of subsistence production. The Board of Fisheries’ 2003 approval of a community harvest system for the Redoubt Bay subsistence salmon fishery sets a precedent for use in other Southeast Alaska communities. Efforts in Yakutat, Alaska, to improve harvest assessment through a permit system that allows harvesters to determine their own levels of need, while expected to decrease barriers to reporting, has not proven effective at lessening the gap between numbers reported on permits and those reported in door-to-door surveys. A regulatory system of this kind is also workable only in areas with no conservation concerns and, possibly, with continuing low levels of harvest pressure.

In 2002, nearly all of the state-managed subsistence fisheries in Alaska restricted the targeting of both coho and king salmon, and these restrictions were written into regulation. Changing the regulations to allow legal targeted harvests of these two species on the Chilkat River would require action by the Board of Fisheries, potentially a lengthy process with no guarantee of success. Recent concerns about the health of Chilkat River king salmon stocks may preclude the establishment of a new subsistence fishery for this species. Although the creation of subsistence king and coho salmon fisheries in state waters potentially involves a difficult process, it may be a step toward improving the degree to which state subsistence regulation reflects customary and traditional uses. Federal management bodies have made moves in this direction by establishing subsistence coho fisheries for some Southeast waters over which they have management authority. Additionally, in early 2003, the Board of Fisheries approved a proposal to establish subsistence coho fisheries in Southeast Alaska’s state-managed waters, a change that is reflected in subsistence permits for the 2003 fishing season. Although many harvesters use rod and reel as gear for harvesting salmon, particularly coho and king, for home use, the state has not followed the federal government’s lead in approving this as legal gear under subsistence harvest regulations and permits.
Subsistence fisheries for king salmon are customary and traditional for the Southeast Alaska Tlingit (e.g., Shotridge 1917; Oswalt 1978; Mills et al. 1984; Betts n.d.), despite a regulatory history that might suggest otherwise. If AMBs are confident that the stock can sustain at least limited harvest, the mandate to manage for a subsistence priority should hold true for this fishery, as for all others under state management. ADF&G has determined a target escapement number for maintaining stock sustainability over the long term. If in-season management indicates that runs are sufficiently strong to meet these escapement goals, there is reason to believe that a subsistence fishery could be allowed. Before such a determination can be made, however, there must be an accurate accounting of the harvest “reasonably necessary for subsistence uses,” once again highlighting the need for improvements in harvest assessment.

At the current time, allowing gaffs as a legal gear type for the Chilkat River subsistence fishery is at the discretion of the local AMB. In the absence of serious conservation concerns related to overall harvest levels on the Chilkat River, the reinstatement of gaffs as allowed subsistence harvest gear would afford official sanction to the use of a documented customary, as well as contemporary, selective gear type. This action, which could be taken at the local level, would be in line with court decisions limiting restrictions on customary and traditional practices in subsistence harvests (see Bobby v. State of Alaska) and could be considered an additional step in the efforts of ADF&G to encourage the use of selective gear types, as has been undertaken by other fisheries agencies along the Northwest coast (Department of Fisheries and Oceans 2002; Parfitt 1999). Such a decision would also have the potential to help improve relations between ADF&G and local subsistence harvesters, many of whom regard gaffs and spears as appropriate and valuable harvest tools, in keeping with both customary practices and harvest efficiency for a number of salmon products. In response to community concerns, local managers in the Haines and Klukwan area are beginning to move in this direction. Although the local advisory council
would not approve gaffs for listing as an approved gear type on the permit, the AMB has begun
issuing special permits to individuals allowing them to gaff fish within the regular harvest area.

The factors discussed above result in discomfort, mistrust, and animosity on the part of
harvesters, which ultimately results in non-participation in harvest assessment. Despite this,
harvesters are not necessarily opposed to the idea of assessment—they recognize its value in
making a case for their subsistence use and needs, should it be necessary—provided that their
interests and approaches are adequately included in the process. Although the local fish and game
advisory boards, the Boards of Fisheries and Game, and other bodies currently in place provide
for a level of local involvement in management decisions, innovative institutions may allow for
greater and more timely participation, as well as participant decision making and action that is
more proactive than reactive.

Working toward the discussed changes in regulation will not, of course, result in
immediate cooperation among the parties. Nor do I pretend it will erase a history of negative
relations between longer-term and more recent residents and between management bodies and
harvesters, a history of alienation of resources and, in far too many cases, the misappropriation of
knowledge. We neither can nor should make such claims, and these histories must be thought of
as inherent considerations in the development of new approaches to management. I also do not
make the claim that such changes in local management are a panacea for management of a shared
resource that is subject to numerous environmental, political, and harvest pressures over a vast
area, resulting in a level of inherent uncertainty.

Nonetheless, I believe it is important to take the first few steps in order to facilitate the
kind of communication that, while currently almost nonexistent in this case, is necessary to
develop more responsible monitoring and decision making. In the case of the Chilkat River,
where fish stocks and rivers in question are generally regarded as healthy, it may be possible to
reduce conflict and increase cooperation by liberalizing regulations, while still working within the
mandates of conservation and precautionary approaches and simultaneously increasing the integrity of management tools. The Chilkat River subsistence salmon fishery may serve as a good test case for future application of these approaches in areas experiencing higher levels of tension that result from concerns over decreasing or more embattled resources.

These changes to harvest regulations may result in additional improvements in both adherence to legal mandates and reduction of conflict between user groups and managers. They may also be a necessary first step toward developing a cooperative or co-management arrangement that more fully involves resource users in setting harvest areas and gear, monitoring local salmon stocks and the general health of the ecosystem, and establishing objectives for sustainable use or enhancement (Pinkerton 1989). These management regimes need to balance or prioritize the interests of local resource users against those of commercial or sport harvesters, as suggested by both legal mandate and current—and commendable—management trends. To be successful, they must also counterbalance the considerable economic influences that a variety of resource-related industries can bring to bear on even the best-intentioned management regimes, as well as directly address fundamental differences in knowledge types among user and research groups (Nadasdy 1999). Simply attempting to integrate the traditional or local knowledge of resource users into the planning process and management policy is insufficient. Management that integrates resource users as actual creators of policy, on at least equal footing with representatives of other interests, and fully recognizes their interests and concerns within decision-making processes, appears to be more likely to lead to sustainable, feasible courses of action.
Bibliography

Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation. Chilkat Bald Eagle Preserve. Brochure.


Statutes


State of Alaska. Alaska Statute 16.05.258. Subsistence Use and Allocation of Fish and Game.

Laws and Court Cases


APPENDIX A
Map 1: General Study Area

Map 2: Haines State Forest and Alaska Chilkat Bald Eagle Preserve
APPENDIX B

Map 3: Boundary of Haines State Forest and Generalized Land Status

Map used with permission: Alaska Department of Natural Resources, Division of Forestry
ALASKA DEPARTMENT OF FISH AND GAME
State Subsistence Salmon Permit
Haines Management Area - Phone: 766-2830

Name: 
Mailing Address: 
Physical Address: 
City/State/Zipcode: 
Telephone No.: No. of Persons in Household: 

Other Members in household authorized to fish this permit:

Name: 
Name: 
Alternate person other than member of household fishing for permit holder because permit holder is blind, has physical disabilities as defined in AS 16.05.940, or is 65 years of age or older (5 AAC 01.011 (g)(1)(A)):

Name: 

Permit Conditions:

1. Permit is valid only for the waters of Section 15-A in all waters of the Chilkat River and Chilkat Inlet north of the latitude of Glacier Point and in Lutak Inlet and Chilkoot Inlet north of the latitude of Battery Point, excluding waters of Chilkat Inlet north of the latitude of the tip of Taku Point (5 AAC 01.730(c)).

2. This permit is valid only for dates and areas listed on this form from June 1 to September 30.

3. Permits must be retained in the possession of the permittee and be readily available for inspection while harvesting fish. A person who is not a subsistence permit holder who is fishing must have a subsistence fishing permit in their possession (5 AAC 01.015(b)(2)).

4. Subsistence fisheries shall immediately remove the dorsal fin of all salmon when harvested (5 AAC 01.740).

5. In the Chilkat River, the subsistence fishing permit holder shall be physically present at the net while it is fishing (5 AAC 01.730(c)).

6. Each subsistence fisher shall keep accurate daily records of the catch harvested, showing the number of fish taken by species, location, and date of the catch and shall keep such records in the possession of the fisher or in a manner acceptable to the department for verification.

7. Only one permit will be issued per household. Permit holder and other members in the household authorized to fish this permit must be Alaskan residents.

8. Fishing for, taking, or molesting any fish by any means or for any purpose is prohibited within 300 feet of any dam, fish ladder, weir, culvert, or other artificial obstruction (5 AAC 01.016(a)).

9. No person may possess subsistence-caught and sport-caught salmon on the same day (5 AAC 01.740(b)).

10. In District 15, subsistencers of Lynn Canal including Chilkat, Chilkoot, and Lutak Inlet, salmon may not be taken during closed periods of the commercial salmon net fishery, except salmon may be taken in the saltwater of Chilkoot Inlet north of the latitude of Battery Point and in Chilkoot Inlet north of the latitude of Glacier Point on the Saturday before any period the commercial salmon net fishery is open in Section 15-A (5 AAC 01.725 (a)(3)).

11. Set Gillnets may not be used to take salmon except in the mainstream and side channels, or not the tributaries, of the Chilkat River from four-mile Haines Highway to one-mile upstream of Wells Bridge and also not by boat or floatplane (5 AAC 01.725 (a)(3)).

12. Salmon may not be taken by the use of a line attached to a pole or rod (5 AAC 01.010(g)).

This permit must be returned to ADF&G by November 10, 2002. Whether you fished or not, please return this form. Permits must be returned prior to leaving the fishing area even if no fish were caught.

Year: 
Duplicate:

Harvest reports must be completed daily prior to leaving the fishing area even if no fish were caught. Mark this box if you did not fish at all.

SUBSISTENCE SALMON FISHING GUIDELINES

<table>
<thead>
<tr>
<th>Species</th>
<th>Possession Limit</th>
<th>Annual Open Dates</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sockeye</td>
<td>25</td>
<td>June 1 - Sept 30</td>
<td>Chilkat River, Chilkoot Inlet, Lutak Inlet</td>
</tr>
<tr>
<td>Pink and Chum</td>
<td>75</td>
<td>100</td>
<td>June 1 - Sept 30</td>
</tr>
</tbody>
</table>

Coho and chumsock salmon, trout, and char may be taken only incidentally by gear operated under the terms of this permit (5 AAC 01.730(c)(1) and (j)). However, it is requested that unprinted chumsock salmon be released immediately in order to benefit replenishing the Chilkat River stock.

Any person violating any of the foregoing restrictions or regulations shall be subject to the penalties prescribed by law.

Permittee Signature (not valid until signed)

Date