

AN ABSTRACT OF THE THESIS OF

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The 4-H Yukon River Fisheries Education and Youth Development Program is a federally funded youth-at-risk program created to help youth escape from the social ills of substance abuse, teen pregnancy, low academic achievement, and suicide that plague rural Alaskan villages. By providing youth the opportunity to learn the skills needed to protect and improve the salmon fishery of the Yukon River drainage and offering them hope for their future, the program is developing the human resources needed to manage the natural resources of the region. The program also provides youth with the education to make choices for their careers and lifestyle. Given the strong cultural influence of the Athabascan people in the area, the program also strives to balance cultural traditions with the technology for development.

The purpose of this study was to describe and analyze the process used in planning, implementing and evaluating a nonformal education

program in a rural Athabascan village in terms of its effectiveness and cultural appropriateness. The study focused on the program in the village of Kaltag, Alaska. Using ethnographic methods guided by Coombs and Ahmed's (1974) "Guidelines for Preparing Case Studies of Nonformal Education in Rural Areas" and Nelson's (1982) "Descriptive Profile of Culturally Appropriate Instructional Resources", the study sought to provide a rich description of the program so that other villages of the region and state can determine whether or not a similar program would benefit the youth in their community. Respondents in this study indicated the program was both effective and culturally appropriate.

Three themes related to cultural appropriateness emerged during this study: 1) community support, 2) relevance to community needs, and 3) program integration with the school. These themes are interrelated and interdependent and are related to the program's effectiveness and cultural appropriateness. In addition, the program's transferability to other communities may be determined by these three themes. Recommendations for further study include a comparative study to determine if these same themes or others have the same importance in villages implementing the program elsewhere.

Cultural Appropriateness in Education and Development:
The Case of the 4-H Yukon River Fisheries Education
and Youth Development Program

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CULTURAL APPROPRIATENESS IN EDUCATION
AND DEVELOPMENT:
THE CASE OF THE 4-H YUKON RIVER FISHERIES EDUCATION AND
YOUTH DEVELOPMENT PROGRAM

CHAPTER 1

Introduction

The subsistence lifestyle of Native Alaskans, steeped in a culture that has withstood the harshness of the climate and terrain of Alaska, has been deeply affected by outside influences, beginning with the Russian fur traders of the late 1700s. Thirty-three years after the United States purchased Alaska from Russia in 1867, more non-Natives lived in Alaska than Natives (United States Department of the Interior, 1984). Commercial exploitation of natural resources by non-Natives nearly decimated many Native communities dependent on the resources for subsistence. The issue of who held claim to the land in Alaska was argued in the courts and Congress for years. Finally, the passage of the Alaska Native Claims Settlement Act in 1971 established aboriginal rights to 43.7 million acres of land and created thirteen regional Native corporations with an endowment of \$962.5 million (Anders, 1986). Soon after, cultural conflicts intensified as the traditional Native ways gave way to a cash economy, corporations, and the lure of the cities.

Substance abuse, suicide, teen pregnancy, and domestic violence pervade the Native communities in significantly higher proportions compared to the rest of the state. Twenty-seven percent of

Native male students and 24 percent of Native female students in the eleventh grade report consuming alcohol on a daily basis (Crawford, 1990). Births to Alaska Native teenage females are twice the rate of the rest of the Alaska teen population. Between the years of 1980 and 1989, the suicide rate for Native Alaskan males aged 20 to 24 was 257 per 100,000. For Alaskan Native females in the same age group, the rate was 44 per 100,000. By contrast, the suicide rate for non-Natives, both male and female, was 16.1 per 100,000 (Alaska Federation of Natives, 1992). Unemployment among Native Alaskan youth is the highest of all ethnic groups in Alaska (Fried, 1989).

Coupled with these problems, the Alaska Federation of Natives (1989) found the educational attainment levels for Native youth to be far below the norms found unacceptable in A Nation at Risk (National Commission on Excellence in Education, 1983). This "educational mediocrity" (p. 48) results in Native youth having fewer choices for their future, rather than more. The report, A Call for Action, (Alaska Federation of Natives, 1989) advocated strengthening the curricula for schools in rural Alaska to better prepare youth for postsecondary education, employment within or outside of the village, or to live a subsistence lifestyle. Above all else, it must be relevant to their life in the village.

These issues are addressed by the goals and objectives of the 4-H Yukon River Fisheries Education and Youth Development Program. The program is in various stages of implementation in rural villages along the Yukon River and is being prepared for implementation in villages along other river systems in the state. The

importance of teaching concepts and skills that are congruent with the Athabascan culture is inherent in the program's design. An important consideration in the adoption of the program should be the degree to which it is culturally appropriate. This study provided information related to the cultural appropriateness of the 4-H Yukon River Fisheries Education and Youth Development Program so that potential consumers of the program have a source of information for decision making and can judge the appropriateness of the program for adoption in their specific locations.

In a letter of support for the program, Alaska State Senator Shirley Craft (1991) wrote, "Programs like this are our best hope for countering negative trends towards substance abuse, violence, teen pregnancies, and educational failure throughout rural and urban Alaska." Adoption of this program by villages in the Yukon River drainage and other Native regions will be influenced not only by its effectiveness, but also its cultural appropriateness.

The purpose of this study was to describe and analyze the process used in planning, implementing, and evaluating a nonformal education program in a rural Athabascan village in terms of its effectiveness and cultural appropriateness. This study will assist other rural villages in determining the potential impact of the program on people and the community. It aims to provide communities direction in developing their individual programs so that the educational needs of their youth are met. In addition, this study will result in an assessment of the methodology used for acquiring information on cultural appropriateness for any subsequent evaluations of the program.

CHAPTER 2

METHODOLOGY

Introduction

This study described and analyzed the process of planning, implementing, and evaluating a nonformal education program and its cultural context of a rural Athabaskan village. An ethnographic approach was utilized for the purpose of data collection and analysis. According to Bogdan and Biklen (1992) qualitative research is characterized by its location within the setting in which data are sought, its descriptive nature, the emphasis on process rather than outcomes, inductive analysis, and use of participant perspectives to derive meaning from data. More specifically, Goetz and LeCompte (1984) described educational ethnography as a means to provide "rich, descriptive data" of educational processes. This is accomplished by conducting research within a small, homogeneous, geographically bound setting, utilizing participant observation as the primary method of data collection, with field notes representing the data base, and researcher persistence at the study site. Data analysis and reporting are oriented toward descriptive explanations of cultural and educational phenomena.

An important consideration in the methodology was the use of both Nelson's "Descriptive Profile" and Coombs and Ahmed's "Guidelines for Case Studies." As complementary typologies, these

two tools were used to guide the data collection and analysis, but did not limit the collection or analysis of data strictly within their parameters.

Setting

The present research was preceded by a visit to the village of Kaltag in August 1991. The purpose of the visit was to become familiar with the operation of the 4-H Yukon River Fisheries Education and Youth Development Program, meet and interact with the youth participants, and to talk with selected members of the community about the program. This enabled the researcher to develop what Malinowski (in Wolcott, 1976) referred to as the "foreshadowed notion" of the general areas in which to proceed with inquiry during the actual study proposed for 1992.

The field work for the study of cultural appropriateness of the 4-H Yukon River Fisheries Education and Youth Development Program took place May 20 to June 10, 1992. The study was scheduled at this time so the researcher could participate in the release of the salmon fry that were raised during the school year in in-class incubators into a nearby lake. It was also necessary to interview the science and mathematics teacher and principal in the school environment before the school was closed for the summer. In conjunction with the study, the researcher was invited to conduct the annual program evaluation because of her former association with University of Alaska Fairbanks Cooperative Extension Service as State 4-H Program Assistant.

Data Collection

Information gathered for the study was obtained through interviews, participant observation, and document review. Field notes were the primary means of documenting interviews and observation. Supplemental audio recording of interviews was proposed for the research, but upon arrival in the village, the obtrusive nature of the recorder seemed to hinder spontaneous discussion and was discontinued immediately. Video documentation, however, was obtained during both stays in the village. This "triangulation of sources," or using more than one source of data, contributes to the validity of qualitative studies (Patton, 1990). Most of the field research was conducted in the village of Kaltag. Lengthy, semi-structured interviews were conducted with five of the eight youth who participated in the program in the summer of 1991, three youth who became involved during the school year and expressed interest in taking part in the 1992 summer program, four parents who represented four families, two village elders, three representatives from the Yukon River Drainage Fisheries Association, the science and mathematics teacher, the school principal, and the former village 4-H assistant, who is now the mayor of Kaltag. Data were also obtained through interviews with the State 4-H Program Leader, the 4-H Fisheries and Youth Development Agent at the University of Alaska Fairbanks Cooperative Extension Service, and the Tanana Chiefs Conference 4-H Director. The Director of Instructional Programs for the Yukon-Koyukuk School District, the district to which the Kaltag school belongs, was also interviewed. For

purposes of qualitative analysis, the primary pool of respondents who participated in the study represent a purposeful sample. Purposeful sampling is defined by Patton as "Information-rich cases...from which one can learn a great deal about issues of central importance to the purpose of the research" (p. 169). Many of the interviews led to discussions with other persons not a part of the original interview schedule. This is referred to as 'snowball' or 'chain' sampling (Patton, 1990).

Respondents were grouped in relation to their perspective of the program. The groups identified were: youth, parents with children participating in the program, elders and community members who did not have children participating in the program, Yukon River Drainage Fisheries Association representatives, school personnel, and administration. Separate interview guidelines were established for each group to direct the discussion without pressuring the respondents for quick or simple answers (Appendix A). Most of the interviews were conducted one-on-one between the researcher and the respondent. Some of these interviews took place while walking around the village, at the store, or at the river's edge where people had gathered to watch the break-up of ice on the river. A group interview was conducted with six of the youth, three of whom were 1991 program participants, and three who expressed interest in participating in the 1992 summer program. This interview was arranged after the first few days in the village so that the dynamics between youth could be captured as part of the cultural portrait. Also attending the group meeting were an elementary school teacher, two representatives from the fisheries

association, and a parent of three of the youth respondents. The youth sat around a large conference table with the researcher while the adult participants sat in chairs away from the table.

All of the interviews were conversational in nature, allowing the respondents to speak at length on the issues. This method also allowed the researcher to clarify information as it was presented by asking for further meaning of statements as they were made.

Guiding the study of cultural appropriateness was the "Descriptive Profile of Culturally Appropriate Instructional Resources" (Nelson, 1982). This tool guided the researcher by providing a framework that identifies culturally appropriate characteristics related to the dimensions of curriculum, instruction, learning environment, administration, and evidence of effectiveness within an educational program. This instrument was created by the Northwest Regional Educational Laboratory as part of a study to identify and describe educational programs for Native American school age children in the Pacific Northwest that were exemplary in terms of cultural appropriateness. The "Descriptive Profile" was designed to allow evaluators to gather evidence through documentation, observations, or interviews that would determine whether the different dimensions associated with cultural appropriateness and their related factors and identifying characteristics were present. The profile was initially developed based on literature review and input from Indian educators. It was then reviewed and critiqued by a panel of Indian educators before being used in the field.

Data Analysis

The method of analysis used for this study was a combination of the analytic process of "theorizing" and the analytic procedure of "typological analysis" (Goetz and LeCompte, 1984). It begins with a very general approach of problem solving and leads to the very specific procedure of examining data from a holistic perspective.

Theorizing is the encompassing process of identifying categories and the relationships among them. The process of theorizing has four components:

1. Perceiving
2. Comparing, contrasting, aggregating, and ordering
3. Establishing linkages and relationships
4. Speculation (pp. 167-174).

The process begins with viewing the entire context within which the study is focused, moving toward the identification of specific units of data and how they are related, and ends with making inferences about the data that will generate significant lessons to be used as a basis for further research. The components of theorizing do not function as discrete activities, but are interdependent and interrelated.

Typological analysis is a more specific procedure that guides data analysis using a given theoretical framework from which information is disaggregated, categorized, and reviewed for relationships. This method of analysis allows the researcher to examine complex data in smaller proportions and facilitates the

establishment of patterns of relationship and cross-coding of categories.

Data analysis took place both in the field, during the time of the study, and after the field work was completed. Statements from interviews were excerpted from field notes and categorized in relation to Nelson's (1982) five dimensions of cultural appropriateness. Data were then reviewed for emerging themes and led to the development of respondent-generated sub-categories. These sub-categories, or themes, were then addressed in subsequent interviews to aid the process of discovery. These were then analyzed in relation to one another and the larger typology. This was an iterative process that gave the study both breadth and depth.

Post-hoc analysis of the data involved reviewing notes, documents, and interviews in their entirety, placing data within the categories and sub-categories, and identifying patterns of relationship among all categories. Because the dimensions of cultural appropriateness were examined in light of the planning, implementation, and evaluation of the fisheries education program, the data were also coded in relation to the structural outline for case studies of nonformal education (Coombs and Ahmed, 1974). This framework guided the organization of the findings. This intuitive and inductive methodology enabled the researcher to bring together related parts of the program and examine them as a system rather than isolated fragments.

In addition to these qualitative methods of analysis, descriptive statistical measures (i.e. mean, median, and mode) were used to

analyze school achievement tests, quarterly grades in math and science-related courses, and records of attendance. This information was intended to provide corroborating evidence of the youth participants' self-reported academic achievement as a result of their participation in the program.

Trustworthiness

In qualitative research, accepted parallels to validity and reliability are what Lincoln and Guba (1989) described as credibility, transferability, dependability, and confirmability. These are the authors' criteria for establishing "trustworthiness" in qualitative studies. The researcher was involved with the 4-H Yukon River Fisheries Education and Youth Development Program, its staff, and participants for over a year on an informal basis, spent a total of ten days in the village of Kaltag, and collected data from several different sources using accepted typologies for the basis of the inquiry. Figure 1 shows the parallel and the measures employed in this study to enhance its trustworthiness.

Figure 1. Establishing trustworthiness.

Quantitative Construct	Qualitative Construct	Methods Used in Study
Internal validity	Credibility	Total of ten days in village; triangulation of sources (i.e. documents, interviews, video); peer review of data.
External validity	Transferability	Detailed description guided by Coombs and Ahmed's Guidelines for Case Studies and Nelson's Descriptive Profile.
Internal/External Reliability	Dependability	Methodology and findings show "chain of discovery;" linkages and relationships between data highlighted.
	Confirmability	All of the above; observer's comments and field notes.

Adapted from Lincoln and Guba (1989)

Summary

In addressing the quality of qualitative studies, Miles and Huberman (1984) suggested the circumstances surrounding the collection of data can result in strong or weak data. Strong data are collected during prolonged contact with respondents; observed or reported firsthand; collected in an official or informal setting, depending on the nature of the study; and volunteered freely when alone with the researcher. Data collected under these circumstances are more likely to produce strong and valid, or credible conclusions. With adequate information describing the context and methods of the study, reliable, or dependable, results can be obtained.

The present study addressed these concerns by prolonged and previous contact in the village of Kaltag and at the University and school district offices in Fairbanks; clearly delineating the process and procedures used for data collection and analysis; utilizing mutually reinforcing methods for data collection; using an accepted typological framework to analyze data, and, inviting peer review of the findings and conclusions.

CHAPTER 3

A DESCRIPTION OF THE 4-H YUKON RIVER FISHERIES EDUCATION AND YOUTH DEVELOPMENT PROGRAM

Introduction

The format for presentation of the findings was influenced by the "Guidelines for Preparing Case Studies on Nonformal Education in Rural Areas" (Coombs and Ahmed, 1974) and includes the topic areas of origins and context; initial planning; operational history and current functioning; costs, financing, and economic viability; and evaluation. Significant lessons learned from the research will be presented in Chapter 4. The five dimensions of cultural appropriateness (curriculum, instruction, environment, administration, and effectiveness) were integrated into the larger format where appropriate. The findings are presented in a descriptive manner, incorporating data from documents, observation, and interviews in chronological order to provide the most accurate picture of the first year of operation of the 4-H Yukon River Fisheries Education and Youth Development Program. In addition, related literature is incorporated to illuminate the findings.

Origins and Context

In December, 1990, the Yukon River Drainage Fisheries Association was created to unify the commercial and subsistence fishers of the Yukon River because stocks of wild salmon returning to

the river have been diminishing over the last few years. The association is dedicated to enhancing fish production for both subsistence and commercial purposes. Recognizing the youth of the region as a key element to the sustainability of the association's development efforts, a youth education component was included in the overall plan for improving the fishery. The members supported the development of an educational program to teach youth the concepts and skills needed to improve and manage the river's fishery. In doing so, the association's board members turned to the Tanana Chiefs Conference and the University of Alaska Fairbanks Cooperative Extension Service 4-H and Youth Development Program for assistance. Tanana Chiefs Conference, Inc., is a Native-owned, non-profit education and human services provider. It has an agreement with the University of Alaska Fairbanks Cooperative Extension Service to provide 4-H and youth development programs in 16 villages within interior Alaska. Together with the state program leader for 4-H, representatives from Tanana Chiefs Conference, and the Yukon River Drainage Fisheries Association developed an educational plan for teaching youth in ten of the villages along the Yukon River about the salmon fishery, its enhancement, and its importance to their future and the Native subsistence lifestyle. The program was designed to blend traditional cultural ties to the salmon with the latest in technological improvements in fisheries.

As part of a broad regional economic development plan, the program links improved management of natural resources with the development of human resources. The goal of the 4-H Yukon River

Fisheries Education and Youth Development Program is to enhance science, mathematics, and literacy skills of village youth to prepare them for employment and post-secondary education related to management of the natural resources of the region. Rural youth in Alaska are plagued by social problems, such as poverty, low academic achievement in school, teen pregnancy, and substance abuse. The 4-H Yukon River Fisheries Education and Youth Development Program addresses these problems by providing opportunities for youth to take part in the technological improvement and management of the salmon fishery, which is so closely linked to their traditional lifestyle and economic survival.

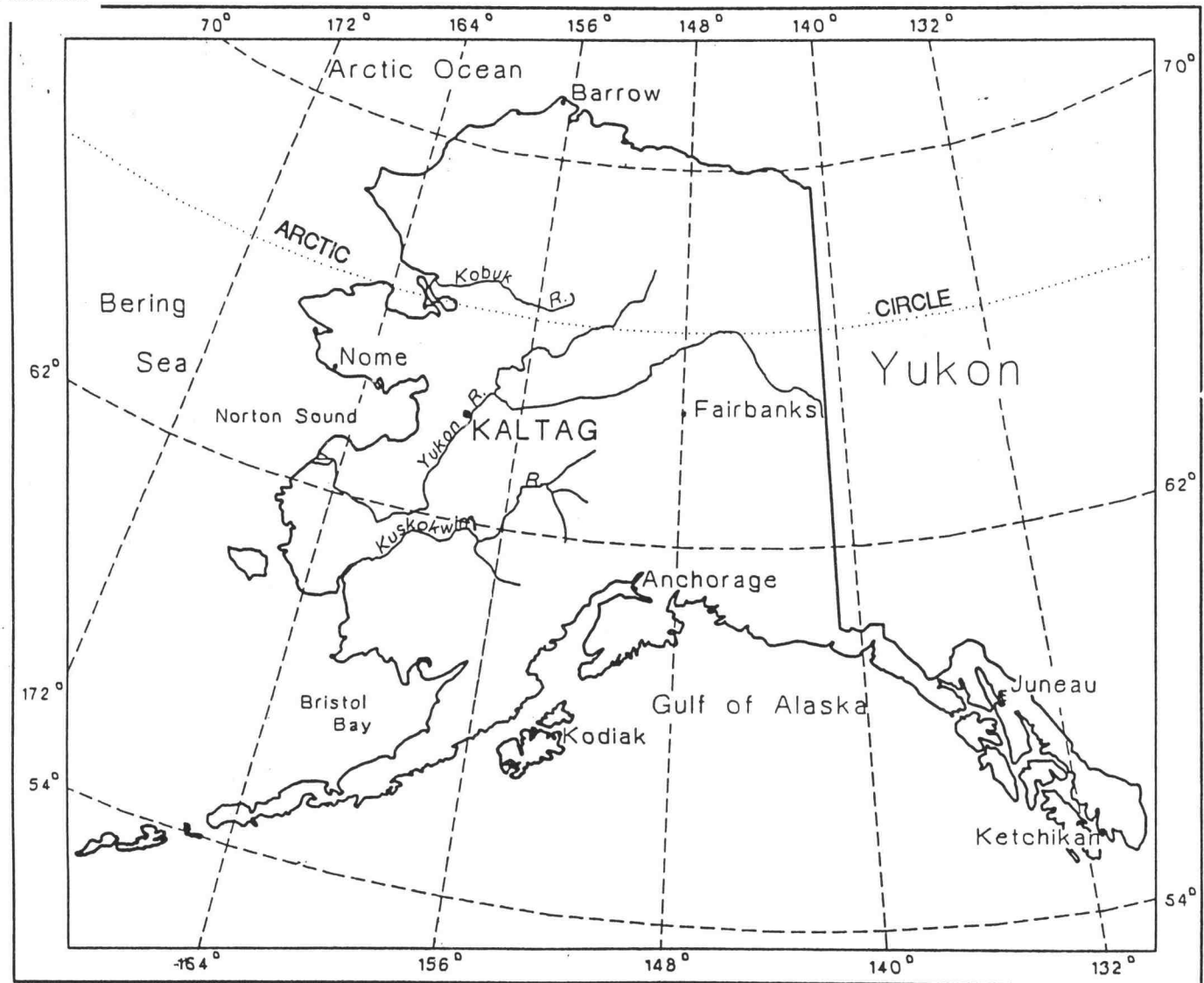
A combination of nonformal, informal and formal educational methods involve the community and the school in the delivery of the program to create a comprehensive and seamless education that is an integral part of the community and regional economic development plan. Defined by Coombs and Ahmed (1974), nonformal education is "any organized, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children" (p.8). Rowntree (1981) defined formal education as "the education a pupil or student receives under the aegis of an educational institution, as opposed to that which he acquires on his own" (p. 95). Education acquired on one's own, "following personal needs and interests in reading, conversation, and other experiences in life without taking courses or looking for help from teachers" (p. 129) is referred to as informal education. It is important to note that although education is

generally classified as either nonformal, formal, or informal, rarely do educational activities fall exclusively into only one classification.

In the United States, the Cooperative Extension Service is well known for providing client-oriented nonformal education programs that reflect the needs of the communities in which they operate. The 4-H Yukon River Fisheries Education and Youth Development Program was funded as a part of the Extension Service-United States Department of Agriculture's Youth at Risk Initiative. The original grant to the University of Alaska Fairbanks Cooperative Extension Service 4-H and Youth Development Program was awarded in March 1991 for \$135,555 and began operating in the village of Kaltag, Alaska, one of ten villages slated for the initial phase of the program.

Kaltag is a small village in rural Alaska, 400 miles northwest of Anchorage, the state's largest city (Figure 2). Kaltag, or "Ggaldoh" which means "camp before the King Salmon," was established in the early 1900s, first as a cemetery for surrounding villages, and later as an important downriver site for steamboat traffic that brought miners to the Yukon River. Today, the village is accessible by riverboat in the summer and dog sled or snowmachine in the winter. Year-round air transportation is provided by small planes that carry both freight and passengers. Barges carrying fuel supplies, building materials, furniture, and other large consumer goods for the community begin their first trip downriver immediately after breakup of the ice on the river, which usually occurs in late May. As many as three barge trips can be made during the summer months before the river freezes (Department of Community and Regional Affairs, 1987).

Figure 2. Map of Alaska.



The village has a population of 240 persons; 92.5 percent of the residents are Athabascans (U.S. Census, 1990). The Athabascan tribe is a traditional hunting and gathering society that settled in interior Alaska from the northwestern region of Canada. The word "Athabascan" refers to both a people and their related languages and was derived from the Cree Indian name for Lake Athabasca in Canada. The Athabascans of Kaltag are referred to as "Koyukon Athabascans" and speak the Lower Koyukon dialect (Thompson, 1984).

In Alaska, the Athabascans are distinguished by geographical regions within the state (Figure 3). The Koyukon region, specifically that of the Lower Yukon division where the Lower Koyukon dialect is spoken, extends east to west between the Anvik and Tanana Rivers and north and south between the Koyukuk and Innoko Rivers.

In a review of the literature on Athabascan culture, Clark (1981) presented a historical picture of the people of the Lower Yukon. They lived in semisedentary village groups, and worked together in subsistence activities such as hunting, fishing, trapping, and berry-picking. It was common to move seasonally from hunting and trapping camps to fish camps along the Yukon River. Species hunted for subsistence included moose, bear, porcupine, beaver, rabbit, and squirrel. Animals were used for food and the making of clothing and personal goods. Waterfowl, such as ducks, geese, and swans, and other birds, such as ptarmigan and grouse, were also an important part of the food supply. During the summer fishing season, king, silver, and chum salmon were caught with fish traps and the fish wheel, which was

introduced in the early 1900s. In the winter, people relied on traps and nets placed under frozen rivers and lakes to catch other varieties of fish, such as whitefish, pike, and blackfish.

The religion and myths of the Athabascan people were closely related to the environment. They believed that all humans, animals, and most inanimate objects had spirits, which could be good or evil, depending upon how they were treated. The killing of some animals was always followed by special rituals and feasts so as not to offend the spirit, and to ensure a successful hunt in the future. People of the Lower Yukon often held celebrations when the first salmon of the season arrived. When fish were caught and cleaned, the heads and tails were thrown back into the river to generate new life so there would be more fish in the future (Clark, 1981; A. VanHatten, personal communication, September, 1992). According to the Koyukon Athabascans, the Great Raven shaped the world, in a story similar to Noah's ark of Judeo-Christian tradition. The Raven is a powerful, yet often comical figure, in many Athabascan stories (McCurry and Jones, 1985).

Clans did not exist among the Lower Yukon people, but bands developed out of the need to share resources within the territory occupied by several village groups. Relations with the other two Koyukon divisions, the Upper Yukon and Koyukuk, were often hostile, although trade was conducted among all three divisions. The Lower Yukon people most often traded with the Yu'pik and Inupiat Eskimos who inhabited the northwestern coast of Alaska. By the mid-1940s, permanent villages had become the norm, as travel between fish and

hunting camps for subsistence purposes was made less time consuming with the introduction of riverboats and gasoline-powered boat engines (Clark, 1981).

Today the village of Kaltag is a juxtaposition of things old and new. On one street corner, a satellite communications dish stands next to an old log cabin that was constructed in the same subterranean style of the coastal Eskimos, a reminder of their past influence on the community. In the yard of one home, the dog team lies motionless in their kennel under the summer sun, while a small plane makes its final approach to the airstrip, bringing mail, groceries, and visitors to the village.

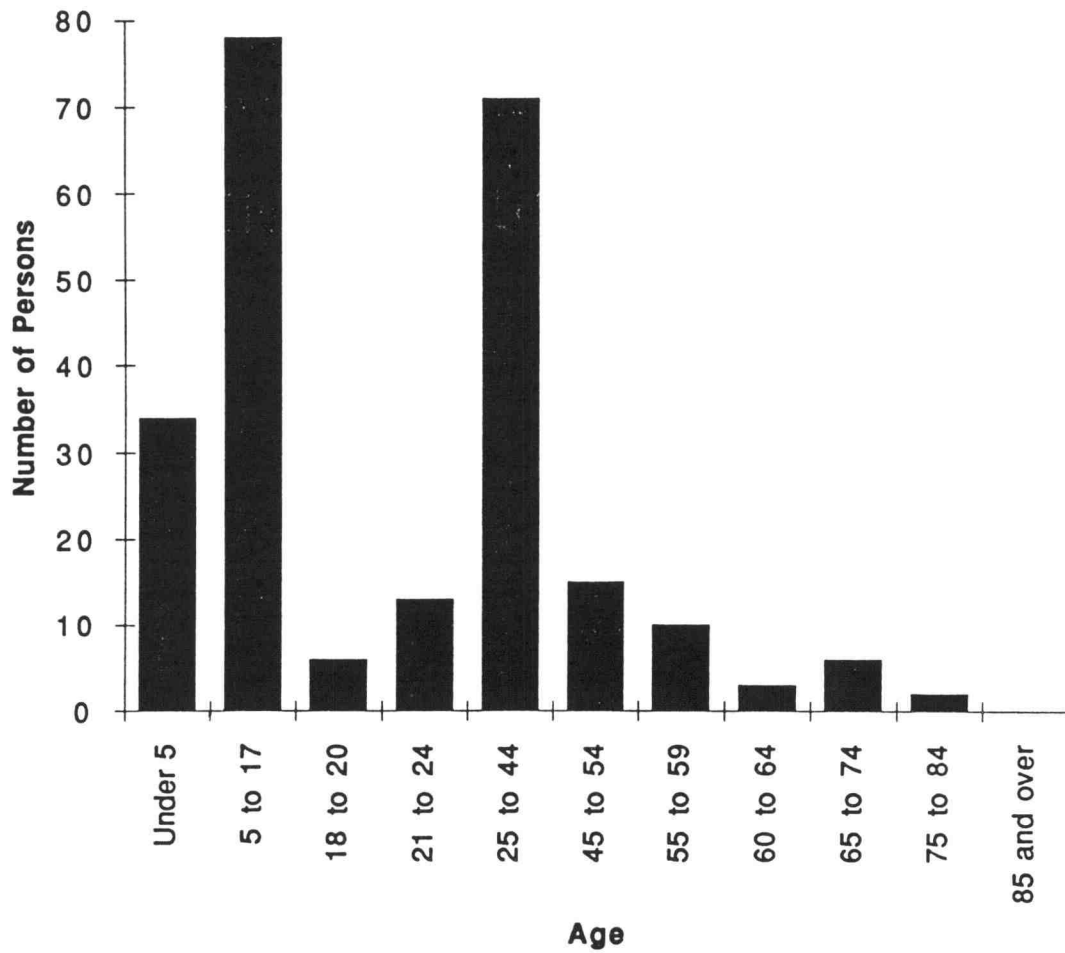
Incorporated as a second-class city in 1969, the village of Kaltag is governed by a mayor and council form of government. For the 1993 fiscal year, the village will operate on a budget of \$146,003. These funds are from state revenue sharing and municipal assistance grants from the state legislature, as well as other governmental grants. Six permanent, part-time employees work for the city in various capacities, ranging from administrative staff to laborers who help with maintenance of roads and utilities. Residents still cling to a subsistence lifestyle that is punctuated with seasonal work provided by the village government, school, National Guard, and Bureau of Land Management. Most of the families in Kaltag have an annual income that falls below the national poverty level, and almost half of the households receive some sort of public assistance (Department of Community and Regional Affairs, 1987).

While the village government bears the responsibility for its economic development, in most cases, plans for development do not proceed without the approval of the Traditional Council, composed of five elders. The role of the Traditional Council is especially important in matters related to subsistence.

The economic development plan of the community is tied to the area's natural resources, particularly the several species of salmon that return to the Yukon River. The central component of the economic development plan is the proposed building and operation of a fish processing plant. A site for the plant has been selected, and water, sewer, and power lines have already been extended to it. Funding for the project is likely to come from federal or state grants. Expansion of the village airstrip, from 3000 feet to 5000 feet, began in the spring of 1992. This will enable larger aircraft to fly to the village for transporting processed salmon and salmon roe to major markets.

The village of Kaltag is relatively young, with 46.7 percent of the population under the age of 18 (Figure 4). Sixty-four percent of the population has a high school education, which is reflective of the 1976 *Tobeluk vs. Reynolds* settlement which allowed for the construction of high schools in villages where none had previously existed. Prior to this settlement, most rural Native Alaskans were forced to leave their villages for education beyond the eighth grade. For many, this meant leaving the village and entering the unfamiliar, mainstream white culture for the first time. Some students went to the major urban areas of Anchorage or Fairbanks and lived in boarding homes or with extended families in these cities. Others were sent to boarding schools

Fig. 4. Age of Kaltag Residents



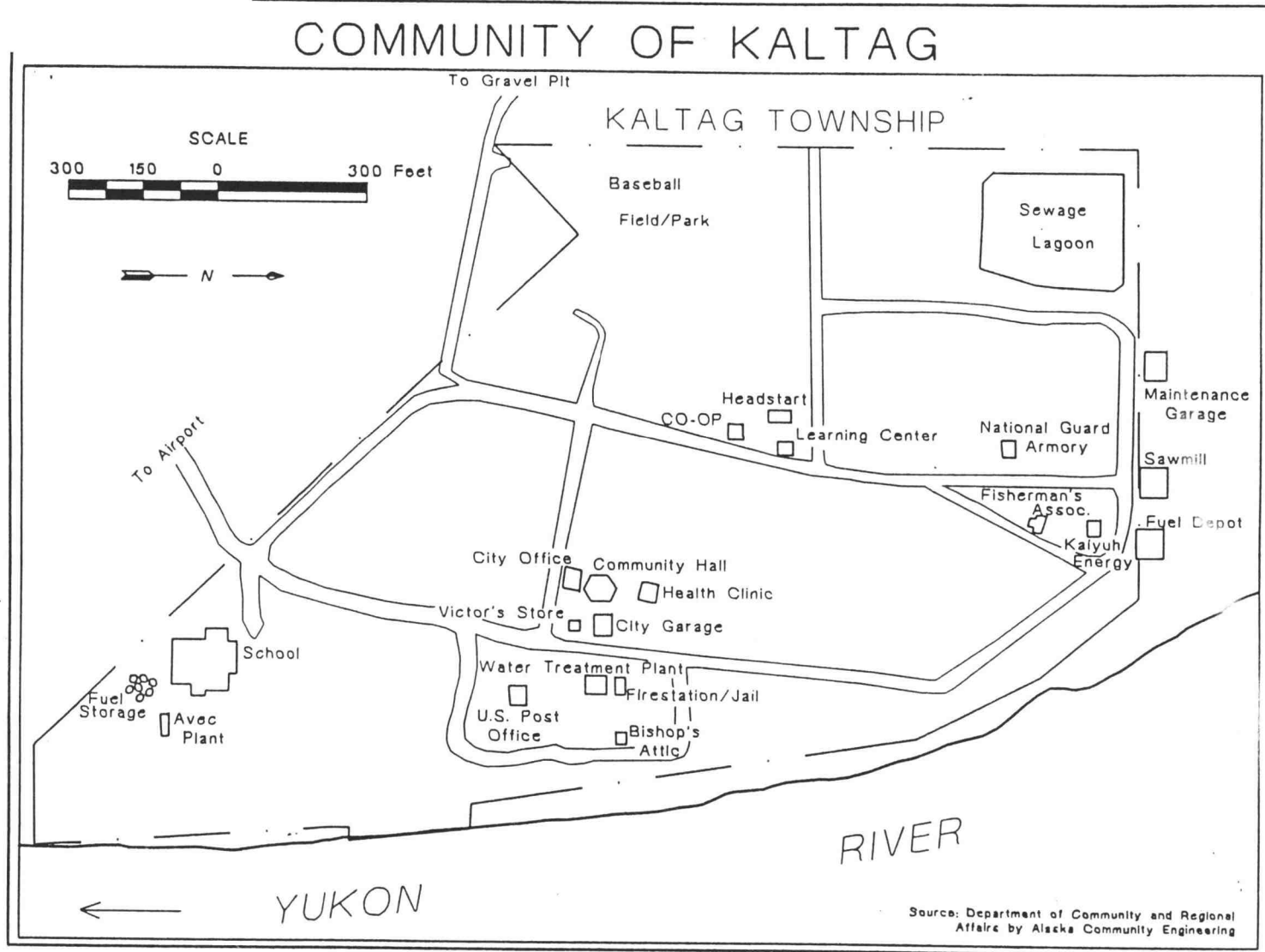
U.S. Census, 1990

controlled by the Bureau of Indian Affairs in Sitka, Alaska; Chemawa, Oregon; or Chilocco, Oklahoma. In 1973, the drop-out rate for boarding school students was 34 percent (Kleinfeld, McDiarmid, and Hagstrom, 1989; Cotton, 1984). Today, rural schools have a very high retention rate, but achievement levels continue to be low. In Kaltag, the local school was built in 1977. It houses both elementary and secondary classrooms, and had an enrollment of 73 students for the 1991-92 school year. Twenty-one students were enrolled at the secondary level, and the graduating class of 1992 had four students. Only one student did not complete the last year of high school.

The school is the largest building in the village and is situated at its southern edge (Figure 5). The modern architecture is similar to that of schools built elsewhere in the same era. Inside, the school is divided into two parts, the elementary wing and the secondary wing. A colorful library and the principal's office are at the center of the building. Both the library and the office have all the accoutrements found in larger schools, such as copiers, facsimile machines, and computers. A large gymnasium is at the back of the building and is used for physical education classes as well as community activities.

The school is a very important part of the community and this is apparent upon entering the building. The entrance to the elementary wing displays the school's philosophy statement which includes the role of community members as partners with faculty and staff to "provide guidance and encourage a sound moral foundation." (For full text, see Appendix B). Parents and community members are invited to a "Community Day" during the school year to offer input on matters

Figure 5. Map of Kaltag.



important to the education of the village's children. In the hallway of the secondary wing, a photo collection dating back to the early 1900s shows Kaltag residents, past and present. Trophy cases line the hallway and are full of awards for students' athletic achievements, with basketball and Nordic skiing being the most prevalent.

Other formal educational programs in the community include Head Start, a federally-funded program for low-income pre-school youth and, as demand warrants, college courses are delivered via audioconference from the University of Alaska Fairbanks. Tanana Chiefs Conference also offers other types of educational programs and resources for the residents of the village. These programs include gardening, employment assistance, food preservation, and mental health counseling.

Near the middle of the village stands the Community Center. A large, octagon-shaped building, its cupola painted bright blue in contrast to the many dark log structures that surround it, the center is used for meetings and traditional events such as potlatches and the Stick Dance. Potlatches are feasts in which everyone shares in honoring deceased villagers, celebrating marriages, or recognizing a young man's first successful hunt. The Stick Dance is an event held in memory of a deceased relative and to give public recognition to the person or persons who were of most help at the time of death. One individual is usually "dressed" as the spirit of the deceased by covering him or herself in furs. Gifts and food are brought to honor the individual and are shared with the community. A spruce log (the stick) is carried through the village and then erected in the Community Center.

Participants dance around the stick which has been decorated with ribbons or furs, and sing traditional songs. The decorations are then removed and the stick is taken down and carried out to the river where it is broken against a pole, with one half thrown upriver and the other downriver, setting the spirit free. These two very important cultural traditions reflect the strong community ties of the people of Kaltag.

Salmon is also a part of these traditions:

We have salmon at the potlatch. It's part of our culture, just like listening to our elders.

Respondent #3

The Athabascan people use fish as a main source of food and treat all animals with great respect.

Respondent #21

The challenge of the 4-H Yukon River Fisheries Education and Youth Development Program was to honor these cultural traditions while introducing new technology to enhance economic development.

Initial Planning

The 4-H Yukon River Fisheries Education and Youth Development Program was conceptualized at the first meeting of the Yukon River Drainage Fisheries Association by a consortium of interested parties. Political leaders, Yukon River Drainage Fisheries Association board members, the State 4-H Program Leader, and the 4-H Director for the Tanana Chiefs Conference assessed the potential for a youth program and gave support for its development.

The program was planned with input from the school, the school district, and Tanana Chiefs Conference. The proposal for funding was submitted by the State 4-H Program Leader just three weeks after the initial meeting. Although community involvement was considered a key element in the implementation and continued operation of the program, representation from the public at large was not part of the planning process itself:

There was very little community involvement in the planning.

Respondent # 6

The time constraint presented by the funding agency (ES/USDA) and the first fisheries association meeting appears to have prevented extensive community involvement in planning. The members of the fishing association, however, were appropriate proxies in giving approval to the development of the plan.

The program is divided into three components: (1) school enrichment, (2) hands-on skill development, and (3) cultural heritage. These three components have been designed to overlap, allowing participants to build skills incrementally and in a continuous, systematic way. The specific objectives of the program will enable youth to:

1. Learn job skills related to fisheries enhancement
2. Acquire technological literacy, knowledge and understanding in math and science, particularly as it relates to fisheries enhancement.
3. Develop cultural pride through an appreciation and understanding of their cultural heritage.

4. Develop citizenship through community service.
5. Youth will improve grades in mathematics and science related courses.
6. Youth will improve rates of attendance at school.
7. Work with positive adult role models.
8. Develop leadership skills.

High school aged youth were identified as the target clientele for this program. Youth in this age group are more vulnerable to feelings of despair and the concomitant social pressures that often lead to substance abuse, pregnancy, and suicide. By providing opportunities for success through employment, improved school performance, and leadership development, the program aims to foster a new generation of traditions that are positive influences on the village. The expected outcomes that are outlined in the funding proposal include improved scores on standardized tests, increased attendance at school, and increased knowledge of fish enhancement and cultural heritage. Other outcomes, not easily measured by test scores, include improved self-esteem, improved opportunities for post-secondary education and employment, and hope for the future. An increase in the number of salmon returning to the Yukon River is also an expected result of this program.

The project was funded on a yearly basis for both 1991 and 1992. Although this makes long-term planning somewhat tenuous, given the nature of the salmon's life cycle, and the need to continually protect the species and the environment from destruction, the project is long-term

in its focus. It is expected that the project will continue to exist in some form for a long time in the village of Kaltag because residents believe it addresses the community's most immediate economic and social needs:

I think it's a good program because the kids need jobs.
It keeps them out of trouble.

Respondent #20

If there was a counselor for everyone in the village that
wouldn't do it--people need jobs.

Respondent #14

The program has the strongest economic tie in Kaltag.

Respondent #5

The program was planned with a holistic approach to natural and human resource development. As the program progresses, it will be able to continue to meet community needs:

There is flexibility to a point. Each village is encouraged
to modify the program as needed.

Respondent #6

In the past, many development efforts failed because they did not involve the people who were to be affected by the change. Now those same people are considered "clients" or partners in the development process, working with educators to address the most pressing issues in their lives. This allows for the two-way exchange of information, making education more relevant, and giving credence to often neglected indigenous knowledge and value systems (Roy, 1982). This element of

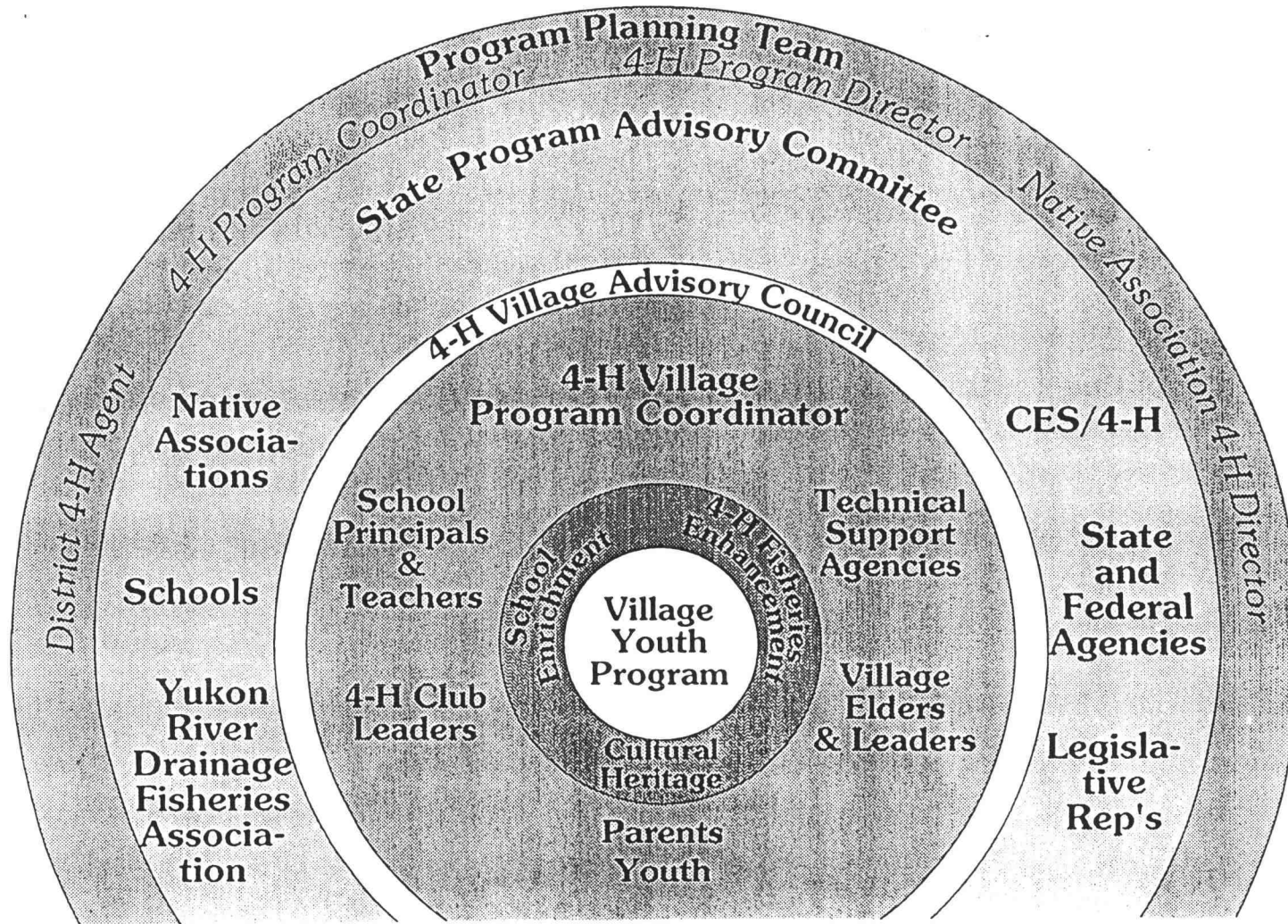
involvement is needed to develop people and communities in a balanced cycle of growth and renewal. The emphasis on self-reliance and the building of skills that will empower people to make changes in their own lives is the very essence of nonformal education (Bock and Papagiannis, 1983).

To address the changing needs of the community, an advisory council was established. This group will serve as a monitor of the program to ensure its compatibility with cultural traditions and to provide guidance and support in matters such as the hiring of village program assistants. The advisory council is composed of seven individuals, including one youth, to give the participants a voice in the direction of the program:

They come from all walks of life in Kaltag--commercial fishermen, subsistence, elders, people from the school.
Respondent #4

The program is also supported on the statewide level with participating agencies providing direction related to on-going program development. Guidance for the entire program is provided by the program planning team, composed of the statewide 4-H Coordinator, the 4-H Yukon Fisheries Agent, the Tanana Chiefs Conference 4-H Director, and the District Agent. Figure 6 displays these layers of support for the program.

Figure 6. Program planning diagram.



Operational History and Current Functioning

The program was originally funded in March 1991 and arrangements for its implementation in the first ten villages proceeded quickly. A site visit to Kaltag was made in May by representatives from Tanana Chiefs Conference and the University of Alaska Cooperative Extension Service. The community was apprised of the nature and scope of the program, and youth were told of the job opportunities that would be available to them:

(They) came to the school and told us about the project and how we could get jobs, so I filled out an application.
Respondent #17

With the support of the school and Yukon River Drainage Fisheries Association board members from Kaltag, the program was given the approval needed to begin operating. Although the project enjoys a great deal of community support, there was one negative opinion expressed in relation to how the program was offered:

I feel it was pushed on the village. We didn't really have enough time to know about it. It was like a last minute thing--do you want it or not? There were no objectives. We thought if it doesn't work, what will people think? They should not impose it on us--tell us what it can offer.
Respondent #4

After the project was approved, a village program assistant was hired and eight youth were selected to participate in the summer youth employment program. These positions were funded with a

supplemental grant from the Job Training Partnership Act through the Alaska Department of Community and Regional Affairs. A fisheries ecologist was also hired as a consultant to conduct preliminary site assessments for the proposed stream-side incubator. Both the consultant and the 4-H Yukon River Fisheries Agent worked with the youth during the spring to teach them about the life cycle of the salmon, fish habitat, and how to collect and calculate data for "fish counts," or the number of salmon returning to the Kaltag River to spawn. The youth then built a twenty-foot tall tower on the riverbank and laid reflective material across the bottom of the river to facilitate the actual process of fish counting and identification. They worked in pairs in four hour shifts around the clock, seven days a week for four weeks (mid-July to mid-August) to gather data. During the hours they weren't in the tower, the youth worked on community service projects such as helping with repair work being done on the bridge over the Kaltag River.

In late August 1991, the fisheries consultant met with the youth again to instruct them in the identification and collection of aquatic insects and stream surveying, two important components for the streamside incubator site assessment. Only five of the youth (all males) hiked the four hours each way through bogs, forest, tundra, and tall grass to the stream to conduct the survey. On the final day of the summer program, the participants completed a program assessment which was required by the Department of Community and Regional Affairs, the agency responsible for the Job Training Partnership Act grant which employed the youth. An informal test covering the

important concepts of fisheries enhancement was also given by the fisheries consultant.

The school enrichment portion of the program began after a teachers' in-service training was held in October 1991 in the village of Galena. The workshop was sponsored by the University of Alaska Anchorage College of Career and Vocational Education and delivered by cooperating agencies including the Alaska Department of Fish and Game, the Southeast Regional Resource Center, the U.S. Fish and Wildlife Service, the Cordova School District, and the Department of Education from Yukon Territory, Canada, as well as the University of Alaska Cooperative Extension Service 4-H Yukon River Fisheries Program and Tanana Chiefs Conference. All of these agencies continue to provide technical assistance to the program. The teacher training focused on the technical operation and upkeep of the classroom incubators and how to use the various curriculum materials available. One session was offered that covered the topic of 4-H and how to establish the program in villages. This session was conducted by the Tanana Chiefs 4-H Director and Program Assistant and was open to teachers aides and administrators. No specific training was offered that addressed the subject of Athabascan culture, but it was proposed for the Fall 1992 in-service program:

We should have something in there about it. What if that's just not their bag?

Respondent #9

Upon completion of the in-service training and delivery and set-up of the classroom incubators, the school enrichment component was fully implemented. Secondary science students (not just the summer youth program participants) assisted in the taking of eggs from a female silver salmon and fertilizing them with milt from male salmon. They then were responsible for monitoring the incubator, measuring the temperature and chemical content of the water, and exchanging water weekly. Other hands-on activities included removing unfertilized eggs, calculating the survival rate of fertilized eggs at each stage of development, and releasing the fry in a nearby lake:

I really liked doing the chemistry tests.

We don't usually get to do stuff like this in school.
Respondent #17

Some of the kids were better at the hands-on stuff. If they're better at that than the academics, that's okay.

There was more involvement by all the students.
Respondent #2

Although participation in the summer youth employment program was based on the income guidelines of the Job Training Partnership Act, all secondary science students participated in the classroom incubator project. Younger students were introduced to the program as well when some of the high school students presented lessons to the third and fourth grade classes in the school. The "spillover" effect was also extended to the community. Residents came to the school frequently to view the development of the eggs in the incubator:

Yeah, even I walked down there a couple of times to take a look. It's pretty interesting.

Respondent #12

Lots of people from town go to the school to see it.

Respondent #4

They came to the school to see the tank and the fish.

Respondent #2

The science teacher at Kaltag School utilized the incubator project to teach more than just science. The curriculum was broadened to include mathematics, reading, and writing skills. The fisheries project was well publicized through the printing of several "Salmon Stories" in the school district newsletter and a Welcome to Kaltag booklet conceptualized by the science teacher that included stories from all Kaltag school students (Appendix C). A cultural focus was also integrated into the lessons. One student chose to express the scientific process through beadwork. On a daily basis, Athabascan words and their English equivalents were written on the board and students were encouraged to use the Athabascan words whenever possible. Students were exposed to a different culture through the reading of Gorillas in the Mist (Fossey, 1983) in preparation for the Academic Decathlon, a state sponsored event that recognizes the academic achievements of schools and individual students. An exchange student from Papua New Guinea also visited the school, further broadening the cultural boundaries of the Kaltag students.

The science classroom was very well suited for the incubator project. Laboratory-style desks and counters filled the small room. The

incubator was situated at the front of the room near the chalkboard, where data important to the development of the fry were recorded. Glass-faced cupboards along the wall in the back of the room held microscopes and natural artifacts such as bones, wood, and stuffed birds. The room was also home to several live animals, including a snake, birds, a rat, a rabbit, and a salamander, in addition to the salmon eggs.

A teacher aide was hired from within Kaltag using supplemental funds from a Job Training Partnership Act grant administered through the Department of Community and Regional Affairs. This individual had the responsibility of tutoring students in mathematics and science, as well as coordinating 4-H club work in the village. The additional assistance in the classroom was beneficial, but the 4-H club did not progress well, primarily because of the conflict with other after-school activities, such as skiing and basketball. Some program participants also had definite ideas about how the club should be oriented:

There's no time after school. It would be good, but in the summer only.

Respondent #10

I'd like it to be organized recreation.

Respondent #15

We should do more of those trust games, like at Teen Focus.

Respondent #11

Our concept of 4-H is farming or gardening. It is so diverse.

Respondent #4

During its first year of operation, the program has overcome a few obstacles, none of which has had a severe negative impact on the program. In Kaltag, there has been some difficulty in hiring staff to fill the position of Village Program Assistant. The role of the program assistant was to provide leadership assistance in the development and implementation of the 4-H program and activities at the village level, including teaching hands-on projects and recruiting and training adult volunteers to serve as role models for youth. Between June and December 1991, two different individuals held the job. During the summer months, the youth often organized themselves to conduct their work because the program assistant missed work to take part in the commercial fishing season or to accommodate family needs:

It needs to be more organized. Sometimes we didn't know what to do.

Respondent #10

There wasn't enough to do. We need more activities. Maybe a community garden or canning workshop.

Respondent #3

A new program assistant was hired in the fall, but resigned within two months to pursue postsecondary education at the University of Alaska.

The lack of trained people has been a real handicap. That would have helped 4-H development more.

Respondent #6

The culture has no history of volunteerism. We need to work more closely with TCC on that. The district agent provides direction, but has no experience with the Native population.

Respondent #5

To continue providing assistance to the community, as well as the other villages in the program, a regional program assistant based in Fairbanks, was hired. While this presented some logistical problems, the connection between the community, Tanana Chiefs Conference, and the University has been maintained:

The basic problem is with trying to coordinate a program in a village from Fairbanks. I kept constant contact to keep from having these problems.

Respondent #21

An issue raised by some of the program participants was the limitation imposed by Job Training Partnership Act income guidelines of who could work during the summer program:

I know a lot of other good kids who would like to work but can't because of the JTPA rules.

Respondent #17

The income guidelines were unfair.

Respondent #3

A technically-oriented problem arose because one component of the original proposal called for the establishment of ten stream-side incubators in each of the villages. The Alaska Department of Fish and Game refused permits for all ten, citing the uncertain effects of releasing such a high number of salmon all at once. In order to continue the program, the use of in-class incubators was proposed, with the construction of stream-side incubators in the following year in fewer villages. This alternative turned out to be better for educational

purposes, giving more students the opportunity to participate in classroom related activities. As the summer of 1992 approached, however, there still existed some resistance on the part of the Department of Fish and Game to grant permits for the construction of the stream-side incubators. It appears the conflict was internal between two of the divisions of the department (Fisheries Rehabilitation and Enhancement Division and Commercial Fishing Division) and although it caused a great deal of frustration for the program staff, construction permits were finally granted and work on the stream-side incubators progressed. Permits for stocking the incubators had not been received by mid-August, requiring a slight change of plans:

...this will allow us to insure adequate water temperature and flow-rates through one winter prior to stocking the incubator. However, if we err on the side of caution with this incubator to insure a successful first crop of salmon fry, we feel that this conservative approach will insure better long-term relationships with both Alaska Department of Fish and Game employees, and Kaltag residents.

Respondent #5

When the program first began, its title was the "4-H Yukon River Fisheries Enhancement and Youth Development Program." The word "enhancement," however, has different meanings to different people, and sent shock waves through the commercial fishing industry. There was fear that salmon being raised in any enhancement program would be a genetic threat to the wild species of salmon in Alaskan waters. The program is "enhancing" the fishery, but has taken the necessary precautions to reduce the threat which exists in larger commercial

fishery enhancement projects. In order to not offend any potential supporters for the program, however, the name was changed:

There's a real perception problem with the word enhancement. We changed the name but we're still doing the same technical assistance.

Respondent #5

The benefits of the program appear to outweigh any of the problems encountered. Of the eight youth who participated in the program during the summer of 1991, many have had opportunities for sharing their knowledge and developing leadership skills. All of the participants took part in the Teen Leadership Focus, an annual 4-H youth leadership conference held at the University of Alaska Fairbanks. One youth served on the local advisory council. Another youth, a 1991 high school graduate, tutored students in mathematics and science at the beginning of the 1991-92 school year before leaving to receive further education and training at the Job Corps Center in Astoria, Oregon. Two other youth participated in national activities, with one attending the 4-H Congress in Chicago, and the other serving as a delegate to the Youth-At-Risk Summit in Washington, D.C.

Operationally, the program has three critical staff positions. The teacher in the school, the 4-H Yukon River Fisheries agent in charge of the program, and the Tanana Chiefs Conference 4-H director have very distinct roles, yet their cooperation and collaboration in delivering the program reinforces the multi-disciplinary team approach outlined by the

program plan. The fisheries agent is the only position of the three that is funded by the program.

The secondary science and math teacher at Kaltag school was well-suited for her role in the 4-H Yukon River Fisheries Education and Youth Development Program. A petite woman from New York, she had not only a science education background, but also four-and-one-half years of cross-cultural teaching experience obtained through the Peace Corps. She was pursuing a master's degree in Cross-Cultural Education at the University of Alaska Fairbanks and expressed interest in doing more overseas work through the United Nations Volunteer Program. "Being out and meeting people" is how she described how to adapt to a cross-cultural teaching situation. Participating in community events, learning the Athabascan language, and attending church (even though she was of a different denomination) were ways she felt she increased her effectiveness as a teacher. Her rapport with students was obvious and natural. During the interview, as students and parents came to the classroom to pick up report cards, she offered genuine praise for academic achievements.

The 1991-92 school year was the last for the science teacher in Kaltag. A new teacher will have to be trained in the operation of the incubator and become oriented to the 4-H Yukon River Fisheries Education Program. How this transition will affect the program and its current level of functioning remains to be seen.

Technical direction for the program is provided by the 4-H Yukon River Fisheries Agent. He has an extensive employment and

educational background in wildlife biology. Much of his prior work experience has been in the rural areas of interior Alaska.

The primary responsibilities of the fisheries agent include coordination of program development with cooperating agencies, schools, and communities; providing technical assistance for the construction and operation of the in-class and stream-side incubators; and working with the Tanana Chiefs 4-H Director and program assistant to facilitate development of village 4-H programs. During the first year of the program, in addition to his program development and management responsibilities, the fisheries agent conducted technical site assessments in several villages, taught youth participants in Kaltag statistical measures for salmon escapement data, and organized the teacher in-service training held in Galena where he also taught a session on water quality testing. A considerable amount of time was also dedicated to promoting the program through local, statewide, and national media.

The fisheries agent is a soft-spoken man whose appreciation for the Alaskan environment is conveyed by his thoughtful work as a scientist. In an effort to expand the program to incorporate more opportunities for youth to learn about the environment, he has applied for funding from the Environmental Protection Agency to conduct snow-quality testing and has worked with several Alaskan state agencies to introduce a new statewide curriculum for fisheries and watershed management. Like the science teacher in Kaltag, the agent has established excellent rapport with village youth and adults. In his own

words: "The more I went to the village, the more I participated, and the more I was accepted."

The third critical staff position is the Tanana Chiefs Conference 4-H Director. An Athabascan Indian from the village of Tanana, the 4-H Director is responsible for the development of 4-H programs in each of the villages where the fisheries program is being introduced. This includes supervision of the regional program assistant and the training of teacher aides and volunteers. She has been with the Tanana Chiefs 4-H program since 1987, working with 16 villages in interior Alaska to develop various types of youth programs, each reflective of individual community needs.

The link between the Tanana Chiefs Conference and the University of Alaska Cooperative Extension Service 4-H and Youth Development Program is unique in its structure. The University provides support for the Tanana Chiefs program, which is adapted for the rural and mostly Athabascan communities in which it operates. For federal statistical reports, however, the program is considered part of the Fairbanks based Tanana Cooperative Extension District. In Alaska, Extension programs are separated geographically into districts, much like the divisions between county programs in the rest of the United States. The district 4-H agent and the Tanana Chiefs Conference 4-H Director are parallel and equivalent positions.

Originally a volunteer for the district 4-H program, the Tanana Chiefs 4-H Director is an important cultural connection in the planning and implementation of the Yukon River Fisheries Education program. In addition to her program responsibilities, she also is part of the

Tanana Chiefs Conference economic development committee. This important work further strengthens the base of support for the fisheries program as well as keeping it current with the needs of the people it is intended to serve. In discussing her role with the program, the Tanana Chiefs 4-H Director said:

...and since I was from that core area I knew a lot of people who understood the need for fisheries education because of the decline in the fishing industry that affected us as Native people who depended on fish to survive. TCC is committed to this project because they see the potential of economic development in the future.

Costs, Financing and Economic Viability

The Yukon River Fisheries Education and Youth Development Program was funded through a grant from the United States Department of Agriculture Extension Service. The grant totalled \$135,555 and was used primarily for program staff salaries, travel, and equipment. Matching funds and in-kind donations totalled \$266,570. A breakdown of the budget is displayed in Figure 7.

The program has received tremendous financial and in-kind support from several cooperating agencies and businesses. Implementing a program such as this requires a great deal of travel to the villages. The only practical way to reach the villages is by plane. Frontier Flying Service, an Athabaskan-owned company that serves interior Alaska with regularly scheduled flights, has supported the program by offering a 15 percent discount on airfare and cargo. Round-trip airfare between Fairbanks and Kaltag cost \$248 in June 1992. Other support has come from the Alaska Department of Community and Regional Affairs which awarded two supplemental grants to the program. One grant enabled the program to hire summer youth employees and village program assistants in Kaltag and Galena, and the other provided for a teacher's aide in each of the schools with an in-class incubator. The United States Fish and Wildlife Service donated a fish weir to be used in Kaltag to help with the collection of salmon escapement data. Trainers from each of the agencies who participated in the 1991 teachers' in-service workshop received no compensation other than travel expenses. The village government of

Figure 7. Program budget (1991).

	<u>Grant ES/USDA</u>	<u>Matching and In-Kind</u>
Salaries		
Program Director (.05 fte)		\$5,018
District 4-H agent (.05 fte)		3,580
Tanana Chiefs 4-H Director and Assistants		70,000
Three village program assistants	\$85,555	
One University-based program assistant		56,012
Clerical assistant		35,750
Travel	\$30,000	
Instructional Support for Village Project		
Computers and other equipment	\$20,000	
Project materials and supplies 10 village projects		50,000
Office space and utilities		9,000
Telephones		7,200
TOTALS	\$135,555	\$236,570

Kaltag supports the program by providing meeting facilities and overnight accommodations (usually at the Fire Hall) at no charge. In-kind support from within the University and Tanana Chiefs Conference is also a significant contribution.

Long-term financial support for the program appears to be promising. Tanana Chiefs Conference obtained additional funding with a grant from the United States Agency for Housing and Urban Development. The grant is for the development of community-based youth programs, such as gardening and recreational activities. It will also support the expansion of the fisheries education project. The State 4-H Program Leader is working with several key state legislators to secure "hard funding" for the Fisheries Agent position. This will allow a large portion of any subsequent funding from the Extension Service to be used for programmatic purposes rather than salary and benefits. The village government of Kaltag expressed its willingness to support the program with funding it receives from the state government.

The program's effectiveness in terms of its economic viability should become apparent with the construction and operation of the proposed fish processing plant. This direct link between improving the management of natural resources and economic development will serve as incentive for youth to become involved in their education and their community's future.

Development efforts are often inappropriate in terms of the scope of project activities and the technology being introduced, resulting in feelings of skepticism on the part of the recipients about the utility of future aid. Conversely, donors express feelings of intolerance toward

the recipients because of waste or misuse of the technology. The donor-recipient relationship in the case of the 4-H Yukon River Fisheries Education and Youth Development Program seemed functional after the first year of the program's operation. This was probably due to the inclusion of advice from the Yukon River Drainage Fisheries Association in the planning stage and from the community on how to proceed once the project was implemented. With this involvement and careful program management, the donor-recipient relationship should continue in a positive manner.

Evaluation

Plans for the evaluation of the 4-H Yukon River Fisheries Education and Youth Development Program described in the program proposal included quantitative assessments of literacy, mathematics, and science skills, pre- and post-testing of technological literacy as it relates to fisheries, and comparison of school attendance records as a measure of program effectiveness. Other measures of evaluation proposed included anecdotal accounts provided by youth, participant observation records of the village program assistant, written evaluations by teachers, technical specialists, and community volunteers, and assessment of school records for information related to pregnancy, violence, or substance abuse.

The evaluation provided by this study focused on the program's effectiveness and its cultural appropriateness. Information gathered through interviews, observation, and review of program documents was

coded in relation to the program's objectives as an assessment of effectiveness. Descriptive statistical information was included to quantify findings related to grades and attendance.

The program's first objective was: "Youth will learn job skills related to the enhancement of fisheries." The link between learning job skills and future employment was evident.

I really liked working outside. We learned a lot. I learned how to work with other people.

One of the things I learned is what kinds of jobs this is leading up to, like Fish and Wildlife.

Respondent # 10

I worked at the Department of Transportation in Fairbanks, but didn't do a lot. I had a better work experience in Kaltag.

Observer's comment: Work at the Department of Transportation was arranged through the Rural Student Vocational Program, a two-week on-the-job work experience program in Fairbanks.

I like biology. I'd like to work in science.

I think the fish processing plant is a good idea--as long as they hire village people.

Respondent #11

This has opened up more avenues for kids. Right now there's nothing we can offer.

Respondent #4

You will have skills to market. This generation is looking ahead.

Respondent #13

Youth and adults in the community seemed to have a clear understanding of future employment opportunities related to the development and management of the area's natural resources.

Acquiring technological literacy, knowledge and understanding in the science of fisheries biology, particularly as it relates to fish regeneration and enhancement was the program's second objective. The evidence indicated gains in awareness were made during the first year of the program.

The program was good because it made kids more aware. This was the first time kids weren't down at the stream spearing fish.

From the city's point of view, this will open up more avenues for kids and teach them how to best utilize the resources.

Respondent #4

The kids that participated in the summer program were more knowledgeable and helped out a lot.

They were questioning why we put the fry in the lake.

Respondent #2

It changed the way kids viewed the environment.

Respondent #7

Biology is pretty interesting.

They (parents) want fish to come back. That's why they want me in it.

Respondent # 10

This 4-H Yukon Fisheries project serves as an 'awareness program' for our youth to start thinking about the diminishing resources of different species of fish, salmon being just one example.

Respondent #9

Youth also demonstrated their understanding of the basic principles of fisheries biology through the stories they wrote for the school district newsletter and Welcome to Kaltag book described earlier. As the program continues, it is likely this knowledge and understanding will become broader and deeper.

The third objective was for youth to develop cultural pride through an appreciation and understanding of their cultural heritage. The cultural component of the program was inherent in many of the various program activities. No overt direction for enhancing the development of cultural pride in youth seemed apparent, but the school enrichment portion of the program provided the most direct and obvious link between the cultural component and the technical educational components.

...everything we teach in the program relates to the Native lifestyle. We're giving everyone a chance to learn and teach what they want and need to know or give.

Respondent #21

They can re-learn what was lost in the last two generations.

TCC role leaders have been fighting for 'traditional Native lifestyle rights' for over 67 years and still have a tough battle ahead of us on 'subsistence' rights. So, I can't say our 4-H fisheries project was a timely thing for us to get involved with.

We could have used it several years earlier, before global awareness took effect--because our elders have mentioned where creeks and streams used to be spawning areas.
Respondent #9

I don't see a conflict (between the program and the culture).
Respondent #3

We learned how to fish from our families. We learned respect for what God gave you.
Respondent #4

As the program continues to develop, community volunteers will assume greater roles in its growth and direction. This will be an important link between cultural pride and the other program objectives. As an example, volunteers will also help youth to develop citizenship through organizing community service projects. Many of the youth took part in community service activities during the summer months when they were not working with the fisheries program. According to program documents, youth helped with bridge repair work, assisted with the Meals for Elders program, and cut grass in front of the homes of village elders.

Youth are very involved in the beauty of their community as well as wanting to further their education in natural resources and a lot of other areas.
Respondent #21

This part of the program provides an opportunity for youth to contribute to the improvement of their community which, in turn, facilitates positive interaction with village residents.

Improved school grades and attendance are the fifth and sixth objectives of the program.

My grades in science got better. Last year I got 'Ds.' This year I got a 'B.' I stayed the same in math.

Respondent # 11

The data available for making inferences about improvements in grades from one semester to the next were inconclusive due to the fact that there were discrepancies between the official school district grade sheets and the school's records. Grades posted by the school district for the second semester showed a slight increase in achievement from the first quarter to the second. This increase was realized by all secondary students, not just the summer youth participants. Classes considered for this analysis included algebra, physics, Alaska studies, chemistry, and geometry.

Attendance records for the second semester were also examined. Summer youth participants had an average of 12.21 days absent. The median days absent for this group was six. Other secondary students had an average of 13.54 days absent with a median of 12.5.

The program also intended for youth to develop leadership skills through 4-H club activities and statewide trainings. During the first year of the program's operation, funds from the grant were used to send youth from Kaltag to Teen Leadership Focus, an annual leadership development conference for teens at the University of Alaska Fairbanks. The funds were not available for the second year. As the deadline to register for the 1992 conference approached, members of

the village government expressed support for the idea of using funds granted from the Alaska Department of Community and Regional Affairs to enable youth to attend.

Kids working together is one of the things that made it (the program) successful.

Respondent #3

We learned trust games (at Teen Leadership Focus). That was good.

Respondent #15

We had a really good time (at Teen Leadership Focus).

Respondent #10

We had a lot of good comments about it. It was a lot of fun and games, but a lot of learning, too.

Respondent #13

Some of the youth had opportunities to participate in other organized leadership activities throughout the year, but 4-H clubs were not active.

Enhancing the self-esteem of participants through skill building and the support of positive adult role models was also identified as a program objective.

Self-esteem is a real issue. They're able to say, "We're successful people now."

Respondent # 7

The fact that the people will become self-sufficient, that a future can be viewed as a positive forthcoming, that education will have a meaning at last, will be a step into a world that has had no impact on the development of the youth of Kaltag, insofar as any positive role-modeling of higher education is concerned.

Respondent #1

One of the feelings of desperation this objective was intended to dispel was expressed by one of the youth participants:

Only the lucky ones go to college.

Respondent # 11

It was the researcher's observation that during the interviews in 1992, youth who were participants in the 1991 summer program demonstrated greater confidence in discussing their future than they had the year before. Although this can also be attributed to maturity and increased familiarity with the researcher, their sustained interest and openness in talking about the program may indicate a positive change in their self-perception.

Overall, the program has met its stated objectives quite satisfactorily. Areas of concern are the components of cultural pride, community service, and leadership development. These components appear to have not received a lot of direct attention in their development, probably due to the staff turnover in the village. As long as the regional program assistant maintains contact in the village and works to recruit and train adult volunteers to help with the program, it is expected these will not be long-term problems. Further development of

the curriculum might also include specific culturally-related components as well as school-based leadership activities.

The program has reached more than just its target audience during the first year. Most of the school-age children in Kaltag have interacted with the fisheries education program, either through lessons taught by secondary students, or observing the egg take in the fall and the release of the fry in the spring. The community watch of the incubator was also an unexpected benefit of the program. Due to the success of the program, many other villages expressed interest in starting similar programs of their own.

Perhaps the most significant side-effect of the program is the hope that it offers youth. Learning marketable skills, seeing a connection between their education, the environment, and future employment, and feeling successful through leadership development and achievement in school are all very tangible things to the youth of Kaltag.

This is what these kids need to see--their place in the global environment.

The success of this project is because it's all hands-on."

...hope is really nebulous. By providing economic incentive, and showing the connection between the subject matter and economic potential, we're providing hope. These opportunities have opened up worlds to them.

Respondent #5

I feel that the program has reached a lot of youth in many villages as well as adults and it's making a drastic change in the way people care for their natural surroundings.

Respondent #21

They're desperate for hope.

Through 4-H, as youth program developers, we are able to help prepare leaders from local communities with the needed proficiency to help keep their community youth busy in life learned skills that revolves around their Native traditional lifestyles, along with experiencing interest in science and modern technology with choices of career fields and working first hand with mentors.

Respondent #9

Plans to continue the program with modifications exist and seem warranted in light of its acceptance and success.

We plan to stabilize it and add as we can.

You can't do the same old thing.

Respondent #6

It should be more than fisheries.

We thought 4-H was just gardening. We should do some of that, too.

Respondent #4

The primary problem associated with the program is that of coordination via long distance. The weakest showing in the program's ability to meet its objectives, as discussed earlier, were due to lack of immediate or continuous contact with program staff.

We need to get out to the villages. We'll probably have more audioconferences.

Respondent #6

The long distances required for travel have also wreaked havoc with logistics, making flexibility a desirable characteristic for those involved in implementing the program. Miscommunication and misunderstanding with the cooperating agencies responsible for issuing permits was a problem area, but as the program has progressed, this seems to be diminishing.

An important consideration in the evaluation of a program is its transferability to other areas. Based on the information provided here, communities interested in adopting a similar program should be able to define the parameters for their own programs. In addition, the respondents offer the following:

These methods can be modelled for other program areas as well.

Respondent #6

You gotta have willing kids and the natural resources.

Respondent #10

The 4-H tie-in is important. I would stress volunteerism.

Respondent #9

The geographic area needs to be suitable.

I personally feel that this program will benefit many villages if they're willing to get involved and keep an open mind, as well as speaking out when they want to.

Respondent #21

Summary

The 4-H Yukon River Fisheries Education and Youth Development Program was originated at the grassroots level. The community of Kaltag has been very active in the development and implementation of the program in their village. The program appears to be well-suited for its social, economic, and cultural context.

The problems that have arisen during the program's first year of operation are both external and internal, and have accounted for some modifications in the program's implementation. External problems include a delay in receiving the necessary permits for building and stocking a streamside incubator, and overcoming the perception problem associated with fisheries "enhancement." The most significant internal problem is that of staffing within the village. Leadership for and continuity of the program was threatened by a rapid turnover of staff. This has been addressed by the development of a regional staff position which has responsibility for maintaining and strengthening the program at the village level.

The program has eight objectives which focus on youth development through improved grades in mathematics and science, learning job skills, and increasing cultural pride and awareness. Most of the program's objectives have been met with success. Not all of the program's objectives were met with equal success, however. Those areas that showed signs of weakness (increasing cultural pride; leadership development; and citizenship through community service) appear to have been a result of a rapid change in staff within a very

short period of time. As the program continues, attention can be given to these areas to strengthen them and provide for a well-balanced education opportunity for youth. This will allow the program to continue to flourish and to take on new dimensions as the needs of the community change.

With appropriate adaptation, the program is transferable to other communities within the state. Description and analysis of the process used in planning, implementing, and evaluating the program in the village of Kaltag serves as a foundation from which other communities can choose to adopt and adapt the program for their own needs.

CHAPTER 4

SIGNIFICANT LESSONS AND RECOMMENDATIONS

Introduction

During the study of the 4-H Yukon River Fisheries Education and Youth Development Program, the three themes of community support, relevance to community needs, and integration of the program with the school emerged as important characteristics of program effectiveness and cultural appropriateness.

This chapter will discuss these characteristics, analyze them from several different perspectives, assess the methodology used, and offer recommendations for further action or research.

Community Support

Since its inception in 1991, the 4-H Yukon River Fisheries Education and Youth Development Program has flourished in the village of Kaltag. Several factors account for this success. The first, and most overwhelming factor, was the considerable amount of acceptance and support from the village residents.

I just knew this would work because we had full support from Kaltag and Galena's key leaders.

...I announced it at the annual TCC convention. The Elders spoke up in advising the Traditional Native Councils, giving us their support also.

Respondent #9

I'm very proud Kaltag was choosen [sic] for this project."

I have a lot of interest in it.

Respondent #18

The parents are behind it.

Respondent #3

The people of Kaltag were very accepting to the program and made it very easy to work with them. Everyone in the community seemed willing!

Respondent #21

It's very well organized.

Respondent #12

There is a high interest in the program, from both the kids and the communities. Anytime you can do that, that's a plus.

Respondent #7

Seven of the ten villages have advisory groups. Some are in name only. Kaltag's is the most active.

Respondent #5

Community involvement is one of the factors Nelson (1982) associated with the administrative dimension of cultural appropriateness. Parent participation in education, overall community involvement in school activities, and positive school-community

relations were the identifying characteristics for this factor. In Kaltag, the level of parent and community involvement in the school was high before the inclusion of the fisheries education program. The fact that this program was "different" seemed to have attracted even more interest. What made the program different was its dual nature, with activities both in and out of school. With the summer employment activities linked to the classroom project, the program was made very visible to the community in a positive way.

Cultural appropriateness requires an investment in the educational process by all stakeholders: students, teachers, parents, administrators, and the community that represents the culture. This was articulated by the Indian Nations at Risk Task Force in 1990. The task force was directed to study the status of Native American education and provide recommendations to the United States Secretary of Education that would improve the quality and academic performance for American Indian and Alaska Native youth (National Advisory Council on Indian Education, 1990). The guiding principles for American Indian and Alaska Native education adopted by the task force include:

- Parents, Elders and community leaders in partnership with school boards, administrators and teachers must become involved in the educational process through setting high expectations for students and in creating a local climate that supports schooling. They must participate in monitoring student progress in school and, in influencing the curriculum and evaluation of students and their programs.

-Real change will require a genuine commitment not only on the part of school systems, but also by tribal governments, Native corporations, educational organizations, community organizations, business, and labor to work together to improve the life-chances of American Indians/Alaska Natives (National Advisory Council on Indian Education, p. 90-91).

Spontaneous interviews with residents of Kaltag whose own children were too young to participate in the program revealed the support went beyond those who had more direct involvement. Much of this type of support can be attributed to the very strong community ties and sense of kinship in Kaltag. The informal leaders of the community, many of whom are members of the Yukon River Fisheries Drainage Association or the Kaltag Fisheries Association, were strong advocates who encouraged the adoption of the fisheries education program. The fact that most of Kaltag's residents are of the same cultural background and socio-economic status seemed to be critical in the community's understanding and approval of the program.

Acceptance of the program was also facilitated by the University's link with Tanana Chiefs Conference. An important factor in gaining community support was the cultural connection provided by the Tanana Chiefs 4-H Director. Residents of Kaltag could identify with her, not only because she shared their same cultural heritage, but also because she was a frequent visitor to the village and a respected representative of Tanana Chiefs Conference. With her role in planning and assisting in the direction of program activities, community members could be reasonably assured that the program was legitimate in terms of its

direct attention to their cultural, social, and economic needs. She also serves as a positive adult role model for the youth of Kaltag.

The cultural representation by TCC was key. We plan to do the same with the Kuskokwim Native Association in other parts of the state. No 'gussok' will ever be Native.

Respondent #6

Observer's Comment: The word "gussok" is a Native Alaskan slang term for "white person." Its context determines whether it is used in a derogatory manner.

The program's link with the University was also important to the community:

Collaboration with the University was important. The 4-H program is something credible for them to latch onto.

Respondent #9

Clearly, positive experience with the two primary organizations responsible for the program has benefitted its acceptance and adoption. By making the program a part of the school, and by association, a part of the community, support could be garnered without overt attempts to do so. The cultural link provided by Tanana Chiefs Conference, particularly that of the 4-H Director, has also been instrumental in generating and maintaining community support for the program.

Relevance to Community Needs

Linked to the program's acceptance by the community is its suitability to local circumstances. The goals and objectives of the

program are relevant to the community's development plans and its aspirations to provide educational and economic opportunities for the youth of the village:

These are a spirited people, wanting to take care of themselves.

It's a good learning experience. The technical assistance is needed.

Respondent #13

The development of the hatchery...is creating a feeling of ownership...which will have such an impact...that will change the economic situation of the Athabaskan People of this area.

Respondent #1

Nonformal programs in rural areas are driven by the need for change in a community and are often conceptualized by both formal and informal community leaders, as well as parents (Sherwood, 1989). The social and economic revitalization of rural communities depends on holistic programs that are developed at the community level and utilize indigenous knowledge, schools, and other agencies to be effective. This approach blurs the lines between formal, nonformal, and informal education.

At a meeting of the Kaltag Fisheries Association in May 1992, discussion of the 4-H Fisheries Program was a major agenda item. The twelve participants expressed their support for the program and discussed how the program would fit in with the work of the association. The local fisheries association represents the commercial fishers in

Kaltag in securing buyers for their products. They also worked to secure the approval and funding of the airstrip expansion and have been given preliminary approval on two grant applications from the Alaska Science and Technology Foundation which would assist the development of the fish processing plant. Many members of the local fisheries association are also involved with the Yukon River Drainage Fisheries Association.

Srinivasan (1977) pointed to the link between social reform and self-determination as the niche for nonformal education. Development through nonformal education is not addressed solely on a topical basis, such as an improved salmon fishery, but in terms of the whole person and their relationship with the environment. Nonformal education must be meaningful to the lives of the people it touches to be effective. The fundamental link between a culturally appropriate nonformal education program and the needs of the community were expressed by Seronde (1986) who stated: "Education should be re-integrated with life as a whole and responsive to aspirations and needs of Native communities" (p.10). The quest for economic development is a need of many Native communities, and the link between education and development will require participatory goal and objective setting as well as the re-integration of non-Native science and the traditional Native world view. To accomplish this, Colorado (1988) suggested utilizing participatory research as a means to build a bicultural research model to integrate Native and Western science. This would give indigenous knowledge systems a place in the teaching and understanding of scientific phenomena enabling all persons to learn from more than one

perspective. The 4-H Yukon River Fisheries Education Program has incorporated a certain degree of research in its activities. By performing these functions with and among the Athabaskan people of the region, the research base for Alaskan fisheries will become much more culturally integrated.

Adapting the program to local priorities and student needs are characteristics identified by Nelson (1982) that relate respectively to the dimensions of administration and curriculum. The interrelationship between these dimensions of cultural appropriateness and the themes that emerged from the study shows program development should not simply be a linear process with little or no involvement by the end user. It requires a continuous cycle of information exchange between program developers and clients, with both parties implementing, evaluating, and adjusting the program as needed. Woog, Kelleher, and Turner (1992) defined this people-centered approach to extension programs as "Systemic Action Research." This approach takes into consideration indigenous knowledge, values, and perceptions to empower the people whose lives are affected by introduction of new technology. The emphasis is less on the technology and more on facilitating the problem-solving and decision-making needed to find suitable solutions to the problems identified by the people in a certain area. The 4-H Yukon River Fisheries Education and Youth Development Program has incorporated these principles of systemic action research in its creation and implementation. Furthermore, the program's relevance to community needs is indicated by the practical

features of the people-centered approach. The program is:

- informed by relevant theory and knowledge
- supported by appropriate technology
- socially desirable
- ecologically sustainable
- economically acceptable
- ethically defensible (Woog, et al., 1992).

The balance between technical support and human services seemed to be key in the development of the program, particularly as it related to community needs. Orienting the program toward the natural resources of the area also added to its relevance and signified the program's responsiveness to the cultural traits of the people of Kaltag.

Program Integration with the School

The third element that has contributed significantly to the success of the program is its integration with the formal education system.

The program itself was wonderful. It's a real asset.

It's a great way to teach science.

It's good PR for us. I'd like to see it in all the schools.

Respondent #7

It's a good program. I was able to include more in the classes. It provided a focus.

Respondent #2

It's an easy program to work with. It's more than welcome.

School involvement, as opposed to none at all, helped make it successful.

We get support from the district for this program--a lot.
Respondent #1

Having it in the school involved parents and people.
Respondent #3

The school involvement was good.
Respondent #4

Evidence of the community's involvement with the fisheries education program at the local school indicates the importance of education to the Athabascans of interior Alaska. A review of the literature showed a history of involvement in local matters of educational concern. When the neighboring Yukon Flats school district of northeastern Alaska was created, the role of the community was viewed as essential in the development of instructional programs that integrated cultural traditions with basic education (Hirschi and Glass, 1977). In a study of school and community attitudes in the Athabascan village of Nulato, 40 miles upriver from Kaltag, teachers, students, and parents alike placed value on a good education in order "to have an enjoyable career" (p. 27). Students and parents, however, also considered learning about Athabascan traditions as an important purpose of schooling and wanted more Native activities in school (Ovando, 1984). These findings indicate the need for further integration

of traditional Athabascan ways in the school setting in order to provide a culturally appropriate and well-balanced education.

After a series of regional hearings held throughout the United States, the Indian Nations at Risk Task Force presented the issues that were most important to Native American communities in terms of education. High on the priority list was the need for the integration of Native language and culture in school curricula. To increase pride and achievement among Native American youth the task force recommended:

"Culturally appropriate instructional strategies [that] are based on a multi-generational approach that asks students to focus on their own culture, work collaboratively in small groups, seek the wisdom of their elders, learn from the environment and experience, and demonstrate their learnings from the work they actually produce" (National Advisory Council on Indian Education, p. 97).

This recommendation is similar to the concept of "lending intelligibility to general education" (Evans and Herr, 1978) which is an objective of vocational education. The 4-H Yukon River Fisheries Education and Youth Development Program provides relevance to science and mathematics courses through its hands-on approach in the classroom and the out-of-school work experience opportunity. Both of these components have incorporated learning and reinforcement of traditional cultural values.

Integrating traditional Native ways with Western technology in a collaborative learning process has also been used successfully to increase the educational attainment of Inupiat Eskimo youth in Alaska

(Okakok, 1989). McCarty, Wallace, and Lynch (1989) discussed the bilingual, bicultural curriculum of Rough Rock Demonstration School in Arizona that helped Indian students relate instruction to their lives and gave more meaning to their education. The curriculum was described as a "both-and" (p. 67) approach that prepared students for the future in both the Navajo culture and non-Navajo culture. The 4-H Yukon River Fisheries Education and Youth Development Program has a similar version of the "both-and" curriculum. The program focuses on providing opportunities for youth to be successful whether they choose to stay in the village or go on to receive postsecondary education or training.

Developing the curriculum for a cross-cultural audience is not an easy task, however. Most of the literature revealed effective curriculum for Native American students was based on traditional ties to nature. Understanding cultural influence on environmental concern is critical to the development and subsequent evaluation of environmental education programs that take place in a cross-cultural setting (Noe and Snow, 1989). Sharpes (1978) proposed a model curriculum for American Indian controlled schools which integrates a "traditional public school" curriculum with one that is culturally relevant by focusing on the environment. Five themes around which the curriculum should be developed include: 1) energy and matter; 2) language and culture; 3) spirit and life; 4) law and economics, and 5) physical development and health. Similarly, Kawagley (1990) proposed teaching science, math, and literacy based on the Yu'pik Eskimos' spiritual relation to nature and then introducing the same concepts from the Western

perspective, helping students to identify patterns of similarity and difference. A culturally appropriate science and mathematics curriculum for Mexican-American students described by Marinez and Ortiz de Montellano (1988) focused on the interdisciplinary nature of such a curriculum. Because of its anthropological and historical foundations, concepts can be taught beyond just the science classroom. The aims of the curriculum are to enable students to develop pride in their culture's contribution to science; to learn science from a familiar cultural base; to find a motivation to consider science as a career; and to recognize the importance of science in their lives.

The 4-H Yukon River Fisheries Education and Youth Development Program is similar in design to the educational programs described in the review of the literature. The expected outcomes are dependent upon the process which includes recognition, understanding, and appreciation of the culture. Nelson's (1982) study supported the literature which showed instructional methods that are based on cultural traditions are more responsive to the needs of the learners and result in improved self-esteem, academic achievement, and attendance rates. These findings are consistent with one of the guiding principles adopted by the Indian Nations at Risk Task Force:

Schools must provide for enriching curricula and assistance that allow for and encourage a student's personal best in academic, physical, social, cultural, psychological, and spiritual development.

Integration of the program with the school was facilitated by the teacher in-service training held in October, 1991. Many respondents

cited this as one of the most important parts of the program. The teachers' ability to carry out the work with the classroom incubators was aided greatly by the 4-H Fisheries Agent, who has a strong scientific background.

The teachers were very well qualified. The in-service in Galena was great.

Respondent #7

The teacher training was excellent.

Respondent #1

The teachers will be able to exchange information at the next in-service.

Having a scientist in charge was a real benefit.

Respondent #6

The local counterpart to the fisheries agent was the high school science and mathematics teacher. Her day-to-day interaction with students and the community helped to maintain the program's effectiveness. One of the recommendations put forth by Nelson's (1982) study was:

If Indian students are going to be successful in school, the instructional staff must demonstrate a unique array of skills, attitudes, and behaviors which are particularly effective in Native American education (p. 57).

Because she was responsible for the majority of the instruction related to the program, the high school teacher had a great deal of influence on

the success of the program by demonstrating the skills, attitudes, and behaviors which are deemed important in Native American education.

The integration of the 4-H Yukon River Fisheries Education and Youth Development Program with the formal school setting is, in effect, related to all of the dimensions of cultural appropriateness. With most of the fisheries education program concentrated in the school enrichment component, the curriculum, instructor, environment, administration, and evidence of effectiveness are all essential parts of the successful integration of what is considered a nonformal education program with a formal education program. The school, with its open door policy, is linked to community support for the program. It also serves as a conduit for community needs by allowing residents to discuss what they perceive as educational concerns. Therefore, the school represents the linch pin between the other two factors of community support and relevance to community needs that have contributed to the success of the 4-H Yukon River Fisheries Education and Youth Development Program in Kaltag.

Summary

In a broad look at Alaska Native education, Johnson and Suetopka-Duerre (1984) linked "direct attention to the specific educational needs of the Alaska Native and to the development of a cross-cultural education philosophy and to the system which attempts to meet these needs" (p. 44) as an underlying basis for educational research. Because Alaska Native groups are separated geographically and by ethnicity, research of culture-specific issues is encouraged. This study examined the Koyukon Athabascan culture and its educational needs.

Through describing and analyzing the process used in planning, implementing, and analyzing the program within the cultural context of a rural Athabascan village, other villages will be able to determine the transferability of the program to their specific locations and circumstances. In the case of the 4-H Yukon River Fisheries Education and Youth Development Program, it was the researcher's observation that cultural appropriateness was due to the idea that the culture is the community, and the community is the culture.

The themes of community support, relevance to community needs, and integration of the program with the school appear to have significant influence on the success of the program. The themes are interrelated and interdependent. They operate much like cogs on a wheel, with movement or changes in one influencing changes in the other two. This holistic view of the program should enable the community and the program's staff to correctly gauge the effects of any

proposed modifications. The importance of a highly trained staff that is sensitive to and functional in the the Athabaskan culture accompanied the themes and should not be overlooked in determining the effectiveness and cultural appropriateness of the program.

Understanding the context in which a program operates is critical to is long-term success. By identifying the school as an integral part of the 4-H Yukon River Fisheries Education and Youth Development Program, the door was opened to the community for their continued involvement in the program. This component of the program should assure that indigenous knowledge is recognized as important in the transfer of technology, as well as serving as a voice for the community and its changing needs.

The program has several important links between different levels of program administration and state agencies. Combined with representation from the community through the advisory council, support from the local government, and as a part of the regional economic development plan of the Yukon River Drainage Fisheries Association, the direction of the program is guided by the combined strength of each. This linkage should provide for program stability and sustainability over time and should be maintained.

This study has attempted to describe the 4-H Yukon River Fisheries Education and Youth Development Program from the viewpoint of the people of Kaltag and other persons who have direct involvement with the program. The relationship between culture, education, and the environment is critical to the sustainable development of communities. In seeking ways to achieve economic

growth in rural Alaskan communities, cultural values and traditions that are so closely tied to the environment need to be recognized as important factors in the education of the youth. Furthermore, only through the active participation of the community can educational programs be developed which appropriately address its needs. This provides a dynamic backdrop for the continued operation of the 4-H Yukon River Fisheries Education and Youth Development Program.

Assessment of the Methodology

Utilizing Nelson's "Descriptive Profile" and Coombs and Ahmed's "Guidelines for Case Studies" helped to guide data collection and analysis in an efficient and effective manner. Although data collection was not limited to the topic areas presented by these two frameworks, they served as good references throughout the study.

Background information and other descriptive data of the operation of the fisheries education program was organized with the use of Coombs and Ahmed's "Guidelines for Case Studies." The authors encourage adaptation of the guidelines as necessary for specific locations and circumstances. The guidelines allowed the researcher to gather information from a very broad perspective and present the information in a systematic fashion that should enable the reader to understand the program and the particular cultural context in which it was implemented. This should also allow the reader to draw his or her own conclusions about the program, its effectiveness, cultural appropriateness, and transferability to another setting.

The "Descriptive Profile of Culturally Appropriate Instructional Resources" (Nelson, 1982) was particularly useful in examining the nuances of the program. This complemented the information that was obtained through the larger case study framework. Although the instrument was designed for assessing programs within the formal education system, it was useful in this setting, which was a combination of formal, nonformal, and informal educational methods. As the three dominant themes associated with the fisheries education program emerged, the typology of the "Descriptive Profile" served as a base from which to analyze data, and begin making inferences about relationships, patterns, and effects of the dimensions of cultural appropriateness.

Recommendations

Recommendations for further action include:

1. Continue the program with a high level of community involvement to reflect the needs and culture of the people it serves. If the community chooses to introduce other educational programs, it is suggested the model described in this study be used for program development.
2. Develop a curriculum for staff training, particularly for local teachers and teacher aides, orienting them toward

the goals and objectives of the program and its link with the community, as well as the latest fisheries education technology. Staff development should also include teachers from other disciplines, such as English and social studies. This cross-discipline integration will provide a culturally appropriate focus for the school's curriculum. In Alaska, distance education technology can be used to complement the curriculum and facilitate staff training.

3. Create opportunities for youth to become involved in leadership capacities within the program. In addition to the one position on the village advisory council, youth can assume roles such as peer tutors and mentors during the school year, and crew leaders during the summer employment program. This will further the development of self-esteem and enhance the process of empowerment of the community.

Recommendations for further study include:

1. Conduct a longitudinal study of the program in Kaltag to determine the effects on youth, the village economy, and the stock of salmon returning to the river. Measures for the study might include rates of substance abuse, reports of community violence, levels of income, academic achievement, and the number of each salmon species returning to the Yukon River.

2. Conduct a comparative study in another village to determine if the same or other community generated patterns of cultural appropriateness exist.

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APPENDICES

APPENDIX A

Interview Guidelines

INTERVIEW GUIDELINES

The interview guidelines served as a reference for the researcher and were not necessarily followed exactly or limited to what is shown here.

PARENTS/COMMUNITY MEMBERS

What are your impressions of the program?

What is your involvement in the program?

How do you see this affecting the future of Kaltag?

What kind of culturally-related activities are there in the program?

Have you seen any changes in your son or daughter (youth) as a result of their participation in the program?

YOUTH

Why did you get involved in the program?

What have you learned in the program?

What did you like/not like the most about the program?

How does what you've learned relate to what you learned from your parents or elders?

What do you want to do after high school?

SCHOOL PERSONNEL/ADMINISTRATION

What is your impression of the program?

How is this program congruent with the school's (school district, university) goals or mission?

What kind of support do you get (receive) for the program?

Would the program continue without funding from Extension?

What did you do to make this program culturally appropriate?

APPENDIX B

Philosophy Statement of Kaltag School

PHILOSOPHY STATEMENT

KALTAG SCHOOL

The role of education is to provide young people with knowledge, skills, personal, and social qualities required to participate in their community and the ever-changing world.

Kaltag School endeavors to set a high standard of academic achievement and instill a productive work ethic and a sense of craftsmanship.

The school will provide an environment for the development of leadership.

Students will develop self-motivation, self-esteem, and the confidence to cope with personal and worldly problems.

Community members, faculty, and staff will provide guidance and encourage a sound moral foundation.

By emphasizing traditional values and introducing new cultural experiences, we aim to provide students with an appreciation of their own culture and individuality.

APPENDIX C

Salmon Stories and Excerpts from Welcome to Kaltag

MY LIFE AS A SALMON

I'm a chum salmon. I was hatched here in the Kaltag River and we have to travel to the Ocean which is about 2,000 miles downriver.

I was swimming along and a big fish was chasing me, so I took off but he was too slow. I hid under a rock and he swam right by me.

I will go to the Ocean and will spend about two or three years in the ocean as a small fry and I will feed on plankton and insects. Then when I become an adult, I will go back to the Kaltag River and reproduce.

□

My life begins as an egg in the dirt at the bottom of a stream fertilized with sperm. It is the month of October and I am just developing at a slow pace. A month has gone by and I have a black dot that is called my rudimentary eye. I begin to sense a picture of where I'm at and what I'm starting to look like.

Another month has gone by and I am developing more and more as I eat the remains of my yolk sac. I dream of someday becoming free and to keep developing more and more as I grow to become an adult salmon.

As I eat and realize that another month has gone by and it is the month of December, I am almost developed to the stage where I can be released.

Now it is the month of February and my body has released an enzyme that dissolved my yolk sac and now I am finally free.

As I continue my journey, I decide to stop off and spend a year in this beautiful lake that my eyes just so happen to catch. After my year is up, I decide to move on to bigger country so I run into this stream. Here I run

When my mother laid me in the Adams River, she knew she would afterwards soon die, but her journey was over and her goal accomplished. When I get out of this sack, I will feed on my mother's minerals for awhile until I start my journey downstream going through the same process my parents did.

Now that I am ready to reach the Sea, I shall begin my long endless journey to the Ocean. As my journey

into danger as I sense a fisherman luring his hook at me. I move on, not being taken in by the colorful hook.

As I continue I run into a bear that seems to be chasing me at a sneaky pace. I escape and continue on to a river where I encounter fishermen with fishnets. I have escaped them also, so I head for the ocean, crossing many miles with turbines and narrows hoping to reach my destination. I may live as all salmon do, and then a scary thing that must always take its course is death.

I have reached the ocean and it is as wonderful as I had dreamed it would be. Now that my four years have gone by I must return to where I was born so I may give life as God takes mine.

As I reach my birthplace I think of all the things that I had to overcome so I may have this special chance to give life as mine is taken. I have released my eggs and my companion has fertilized them with his sperm. Together we go off into a stream to die together as we have lived together.

□

begins I cover about 2 miles a day going through rough water with boulders in them. When it looks good I try go as fast as I can while watching some of my friends getting eaten by bears or birds of some sort. As I know, my journey will not be easy. I must try to survive using my mother's skills.

While travelling at day, I encountered a dark shadow almost standing over me all of a sudden, a bird dove in at me, but I go for cover under a rock where I can't be reached. Final my journey ends in the ocean.

I lived there for many years avoiding predators and humans. I am now ready to start up stream with my school.

I do not need a compass or map to know where I am going because I am much bigger. As I avoid fish trollers I made it to the Adams River where I shall find a mate and fertilize her eggs.

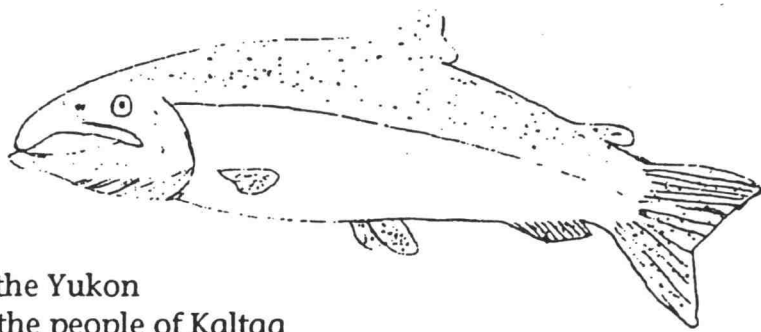
□

I am a female fish. On my journey back home there were a lot of animals and fishermen trying to catch me. I got caught in a fish net, but the holes were really big and I had a difficult time getting out. A big brown bear tried to grab me, but I was too fast although it made a little scar on my fin. The weather is very cold now and it will be icing up very soon and I will die if nobody catches me first.

I lived a happy life. I thought I would live through my four years, I will now have my eggs and then die. It's been really fun. But it was hard for me because I had to look around for food, and it was hard because we often had to fight for our own food.

□

Salmon Along the Yukon



Salmon is one of our most important sources of food and income along the Yukon River. During the summer the people of Kaltag commercial and subsistence fish for salmon. After catching the salmon most people smoke, freeze, or dry their fish. The fish that are preserved in the freezer are used for the long cold winter months.

The five different species of salmon (Chum, King, Silver, Chinook, and Humpy) that travel up the river all spawn in creeks that drain into the Yukon River. Salmon that we harvest for our own needs are King and Silver Salmon. The other 3 types of salmon are mainly used for dog food.

Salmon is eaten by people from all over the world. People who commercially fish sell the roe (eggs) and the fish to fish buyers who then transport them to canneries where they are put on the market.

Most of the salmon sold come from five species that live in the coastal waters of the North Pacific Ocean. Although salmon are born in fresh-water streams, they spend part of their life in the ocean.

Most salmon spawn during the summer or autumn after swimming upstream as far as 2,000 miles from the ocean. The journey may take several months. Female salmon lay their eggs in the gravel bed of a shallow rippling stream. A male salmon stands guard as the female turns on her side and digs a saucer shaped nest in the gravel by swishing her tail up and down or back and forth. The female then lays her eggs in the nest. and then the male fertilizes the eggs with his sperm. The female then swims forward a short distance, and digs another nest so she may lay more eggs.

The male and female may repeat the spawning process several times. The gravel dug from each nest normally washes back and covers the previously laid group of eggs. During spawning, the female lays a total 2,000 to 10,000 eggs.

The eggs hatch after a period of 3 or 4 months, and the baby salmon lie hidden in the gravel for several weeks. The eggs feed on their yolk sac which is attached to their stomach. Different species of salmon leave fresh water immediately after they come out of the gravel. Other species may spend up to three years in freshwater. They live off insects and small animal life such as plankton.

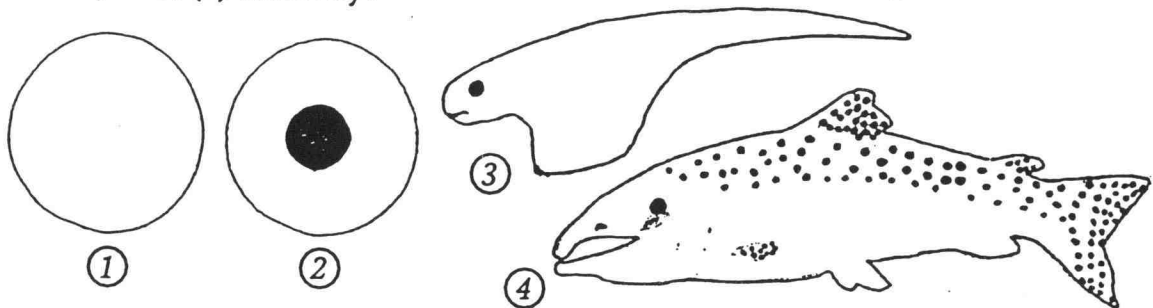
Spawning Salmon

The salmon incubator in Kaltag School is designed for the enhancement of the Chum Salmon in our region. The salmon were taken from the Kaltag Creek, a tributary of the Yukon River which flows down to the ocean.

Everyday the temperature is recorded to make sure the water is cold enough to allow normal development of the eggs (2° to 3°C).

Our chemistry class does chemical tests on the water in the incubator to see if everything is normal. The maintenance of the incubator includes tests on the amounts of: oxygen, carbon dioxide, hardness, nitrites, pH, chloride, alkalinity, and ammonia. We also have to exchange 50% of the water so the concentration of ammonia does not become too great.

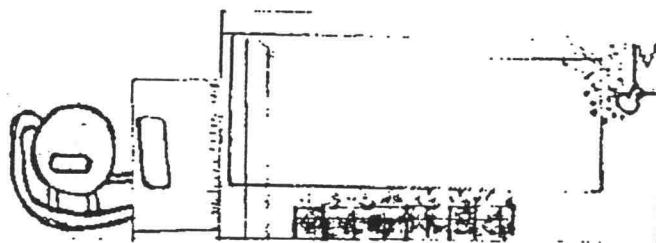
The salmon eggs will go through four stages of development: (1) round pink eggs, (2) black eyes will appear, (3) alevin- fry with attached yolk sac (food source) and, (4) small fry.



Once the eggs hatch we'll do chemical tests and water exchanges more often because the fish will be feeding and producing wastes.

As the small fry grow and develop they will be released into the natural environment of Swimming Hole Lake here in Kaltag.

Grade 11



Salmon Incubator and the eggs.