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LIMITED ENTRY POLICY AND THE
BRISTOL BAY, ALASKA SALMON FISHERMEN

A report prepared for the Alaska State Legislature
Based on a survey conducted in Summer, 1979

by

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Institute of Marine Resources
IMR Reference No. 79-7

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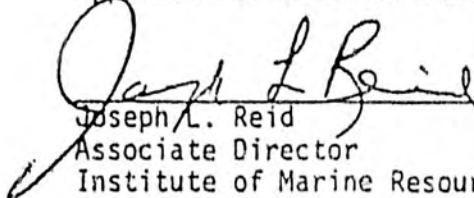

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Abstract

A systematic survey of Bristol Bay, Alaska salmon fishermen was conducted in summer 1979 to examine the impact of limited entry (LE) policy upon them. 56 fishermen and 57 Bristol Bay-area households were surveyed.

The fishery is composed predominantly of ethnic Italian and Scandinavian fishermen from California and the Pacific Northwest, native-Americans residing in the Bristol Bay area, and greater Alaska residents. Bristol Bay-resident and non-Alaskan ethnic fishermen tend to perceive themselves as being primarily fishermen, although they spend the greater part of the year in non-fishing activities. However, their ethnic roots and most of their annual income are from fishing. Non-Alaskan fishermen are often involved in other fisheries, as well as various forms of predominantly blue-collar employment. Local residents fish only in Bristol Bay, and their economic opportunities are extremely limited for the remainder of the year. However, while local fishermen are more dependent upon the Bristol Bay fishery, they tend to earn less from it. Local residents have markedly poorer gear and vessels.

Non-local fishermen -- particularly non-Alaskans -- view LE favorably. They generally believe the policy improves fishing conditions by restricting the amount of gear in the water, and that it enhances fishing income by limiting competition.

Local residents tend to view LE negatively. They perceive that LE limits their participation in the fishery and thus diminishes household income. LE effectively blocks transmission of the fishery to

the young: while 59% of local men 18-24 fish in Bristol Bay, only 15% have permits. Furthermore, a significant proportion of local residents of all ages failed to obtain LE permits. Apparently, social, cultural and economic factors related to life in rural Alaska were not given sufficient consideration by the LE Commission.

The present LE policy is seriously limiting access for many Bristol Bay residents to the area's primary economic resource. This unintended consequence of present policy has serious implications to already-marginal village economies. Steps are outlined whereby this situation may be corrected.

INTRODUCTION

Fisheries in western countries have traditionally been open to all who obtained the necessary license and gear. In recent decades resource economists have argued that this arrangement leads to economic inefficiency - namely, that the harvest of open-access resources tends towards an equilibrium where no profit is realized, since so long as there is a profit to be made additional persons will enter to exploit the resource (Gordon, 1955; Crutchfield and Pontecorvo, 1969). Impressed by this argument, fishery managers have placed a number of fisheries under a radically different regulatory regime known as "limited entry" (LE). Under LE management the number of fishermen harvesting a particular resource is limited, usually to present license-holders.

Various forms of LE have recently been introduced in Japan, Canada, South Africa and the United States. Similar systems were instituted long ago by native societies in western North America and Polynesia (Johannes, 1978). Each LE scheme has unique characteristics in terms of the criteria for granting licenses, transferring permits, and enforcement of the regulations. In most nations where LE has been implemented, emphasis has been placed on optimising the biological and economic factors of a given fishery, and less attention has been paid to the broader social and cultural impact of LE legislation. This study was undertaken to examine LE in the salmon fishery of Bristol Bay, Alaska, specifically taking into account its effect on the social structure of local fishing communities.

The salmon fisheries of Alaska were first developed in the late 1800's, with exploitation centering on red salmon. By the 1920's overfishing was sufficiently widespread to become generally apparent (Crutchfield and Pontecorvo, 1969), and the fisheries responded by diversifying to include the chum and pink salmon. Landings of salmon steadily declined from the 1930's through the 1950's, and were then followed by a mild recovery in the 1960's. However, in the early 1970's some of the poorest harvest in history were recorded, particularly in Bristol Bay, and the economy of coastal fishing villages seemed on the verge of collapse. At this time LE was introduced as a measure to ensure future stability of the salmon fishery.

In this study, I have examined the consequences LE policies may have on traditional fishing strategies and life-styles. In particular, there is concern that LE may adversely affect the transmission of the fishery to future generations. There also exist questions as to whether or not culturally disadvantaged groups have suffered excessively, and what impact LE has had on crewmen and the entrance of young people into the fishery.

The Bristol Bay salmon fishery is, for several reasons, ideally suited to a study of the social, economic, and cultural impact of LE. The social makeup of the fishery is a microcosm of American west coast fisheries: there are both full- and part-time fishermen, fishermen with and without alternative incomes, fishermen with Italian, Scandinavian,

and Croatian ethnic origins, and both native and non-native American fishermen. Because of the geographical isolation of Bristol Bay, its fishermen are dependent upon several centrally-located canneries located in two fishing villages, Naknek and South Naknek, for their market, services, and - most importantly - their housing. This situation greatly facilitated sampling the fishing population. LE has been in effect in Bristol Bay since 1974, giving sufficient time for its impact to emerge. This region seemed particularly apt for a study of the LE question since Crutchfield and Pontecorvo (1969) used the Bristol Bay salmon fishery as an example of a fishery in need of LE. Furthermore, I am personally familiar with the fishery, having fished the Bristol Bay sockeye run myself for two seasons (1970-71).

This study was conducted during the fishing season of 1979. The results show that changes have indeed taken place since the advent of LE. Not all of the effects of LE have been favorable, and I shall present recommendations as to how some of the present problems might be overcome.

METHODS

The survey was conducted using standard questionnaires administered to three groups of respondents: captains of fishing vessels; crewmen aboard surveyed vessels who had crewed for more than five years; and local villagers, most of whom were native Alaskans. The questionnaire was composed of questions that covered the respondent's basic demographic characteristics; his own and his family's involvement in fisheries, particularly in Bristol Bay; the impact of LE on his household's fishing income and fishing strategy; and his views on LE and its effect on various groups of participants in the fishery. A more detailed form of the questionnaire was used to interview captains, and contained questions concerning his vessel and gear used in Bristol Bay.

I obtained lists of the captains under contract with four of the eight major canneries in the Naknek area. Systematic sampling of the cannery lists was used to select approximately 1 out of every 3 captains to be interviewed. Of those selected, 47% - a total of 42 captains - were actually interviewed; this response rate reflected in large part the many "no shows" and fishermen on company lists who fished out of Egegik or Dillingham rather than Naknek. A small number of crewmen were also interviewed.

Households in four local villages were surveyed. The villages of Naknek, South Naknek, Mondalton, and Kokhanok represented a gradient

of proximity to the outside world. This survey in Naknek and S. Naknek was based upon the Borough Tax Assessor's maps and property lists; the surveys in Nondalton and Kokhanok were based on a mapping of all residences in the village prepared in conjunction with local residents. All village samples were based upon a systematic sampling procedure, surveying between 1 in 2 to 1 in 4 households. Of the 66 households selected, 57 were surveyed, giving an 86% response rate. The head of each household was the only person actually interviewed, but questions concerning all household members were asked. Thus the household survey actually covered 235 individuals. Between 10 and 20 households were surveyed in each village.

The survey team was composed of myself, Mary Gilliland (a graduate student in anthropology and logistical coordinator for the program), and six volunteers who jointly funded the program through the Center for Field Research. In addition to the questionnaires we also conducted less formal interviews with cannery superintendents, fishermen's union officials, local community leaders, and numerous fishermen and residents. Detailed field journals of these interviews and contracts were maintained by both Ms. Gilliland and myself.

Data analysis consisted of reviewing the journal material and statistically analysing the questionnaire results. The survey material was evaluated according to the total response, the response from captains and crew, and the response from local villagers. The data on fishermen were categorized according to ethnic grouping as well as according to place of residence (whether Bristol Bay, greater Alaska, or outside Alaska). Data obtained in village surveys were

separated village by village and the results were assessed according to age, sex and ethnic group.

RESULTS

The total resident population of Bristol Bay area is approximately 4600 (Kresge, *et al.*, 1974), and the salmon fleet is comprised of approximately 1500 vessels. A total of 113 questionnaires were completed. Of the respondents, 42 were captains, 14 were crew members, and 57 were heads of households in the villages of Naknek, South Naknek, Nondalton and Kokhanok. The average household contained 4.12 inhabitants; a total of 235 residents were included in the village survey. Of the 66 households selected for censusing 21 were located in Naknek, 14 in South Naknek, 17 in Nondalton and 14 in Kokhanok.

Demography

As seen in Tables I-II, there is a close relationship between the place of residence and ethnic origins of Bristol Bay fishermen. The Bristol Bay fishery is dominated by non-Alaskans, primarily Italian-Americans living along the coast of California, as well as Scandinavian-Americans living primarily in the Pacific Northwest. These ethnic groups (hereafter referred to as the ethnic fishermen) were among the first to commercially exploit the Bristol Bay runs. Local residents (80% of whom are native-Americans) notably comprise a minority of the fishing fleet -- only 10.6% of Bristol Bay captains who fish for the major canners (Table II). 21.6% of Bristol Bay captains are from other parts of Alaska. Overall, Californians predominate, making up 42.6% of all the fishing captains.

Crewmen are also largely from outside Alaska (66.6%) (Table II).

The Bristol Bay fleet is clearly dominated by older fishermen. Tables III-IV show the age composition of the respondents. The majority of captains are between the ages of 36 and 65, more than half of these being over the age of 50. The degree to which this age-distribution has been influenced by LE policy is not known, although as discussed below, LE policy appears to inhibit the entry of young fishermen into the fleet.

Involvement in Fishing

The survey of fishing captains examined the degree to which different fishery groups were involved in fishing and dependent upon it, and their relative standing in the Bristol Bay fishery.

As seen in Tables V-VII, most Bristol Bay fishermen are involved in non-fishing activities during most of the year, regardless of their ethnicity or residence. However, Bristol Bay residents tend to be involved during the remainder of the year primarily in bush-related activities, i.e., subsistence activities, guiding and trapping, while non-local fishermen tend to work in blue-collar jobs (Table V).

There appears to be little basis for the widely-held belief that the fishery is being overrun by vacationing professionals (i.e., teachers, lawyers, doctors). However, even as a small minority (5%) these relatively inexperienced fishermen are highly visible to the rest of the fishing community. But most Bristol Bay fishermen fish only 1-2 months of the year (Table VI), although non-Alaskans tend to spend more of the year involved in fishing. This is further borne out in

Table VII, which shows the extent to which captains are involved in fisheries other than the Bristol Bay salmon run. The large majority (>90%) of Alaskan captains, including Bristol Bay residents, fish only in Bristol Bay. By contrast, 28.9% of non-Alaskans are engaged in one other fishery, and 13.2% are involved in two other fisheries.

Despite the relatively little time devoted to fisheries, the overwhelming majority of Bristol Bay residents and non-Alaskans (but not the residents of greater Alaska) consider themselves to be primarily fishermen (Table VIII). No doubt this results in part from their traditional involvement in fishing. Furthermore, irrespective of residence, approximately 50% of captains depend upon fishing for more than two-thirds of their income, approximately 30% derive between one-third to two-thirds of their income from fishing, and the remaining 20% obtain less than one-third of their income from fishing (Table IX).

It is important to note, however, that local residents are far more dependent on the Bristol Bay fishery per se. As seen in Table X, more than half of the captains who are local residents are dependent upon the Bristol Bay fishery for more than two-thirds of their income. By contrast, only 20% of non-Alaskan captains are as dependent upon the Bristol Bay fishery. Non-local fishermen tend to be involved in other fisheries to a greater extent (Table VII).

When income from the Bristol Bay fishery is examined with respect to ethnic origin, similar patterns emerge. Table XI shows that 50% of natives acquire more than two-thirds of their income from the Bristol Bay fishery, whereas of the ethnic Italians, Croatians, and Scandinavians, only 9.5% fall into this category. However, when ethnic origin is considered against the percentage of income derived from all fishing activity, shown in Table XII, it can be seen that all groups are more or less equally dependent upon fishing as a whole.

Although local residents are more economically dependent upon the Bristol Bay fishery, their earnings from the fishery are significantly less. This conclusion follows both from the response to questions about income and from consideration of the gear and vessels used by local and non-local fishermen. Table XIII shows the breakdown of total annual income from the Bristol Bay fishery according to the place of residence. Due to the reluctance of captains to divulge information about their absolute annual income, there was a very low response to this question: 85.5% of local fishing captains and approximately 50% of non-local fishing captains would provide no information. However, of those responding, non-local captains appear to earn considerably more from the Bristol Bay fishery. Bristol Bay resident captains were distributed more or less equally among all income categories (i.e. <\$5,000, \$5,000-10,000, >\$10,000), while few non-locals make less than \$5,000 per year on the Bristol Bay fishery, and the largest fraction earn in excess of \$10,000 per year.

While the data on income from the Bristol Bay fishery is sparse, the apparent difference between local and non-local fishermen is

strongly supported by ancillary data on their vessels and gear. Table XIV shows that 97.6% of non-local fishermen have the standard 32' Bristol Bay gillnetter, while only slightly more than half the local residents have 32' fishing boats. Most other local residents have skiffs. While skiffs require a smaller capital investment, they hold fewer fish and, being less seaworthy, can be fished for fewer days of the season. Also, when the cannery impose limits on their fishermen due to limited capacity, the limit imposed upon skiffs is typically half the limit for the 32' gillnetters. Thus skiff-fishermen earn considerably less during a season than fishermen on larger vessels.

The difference in the fish capacity of the local and non-local fishing fleets can be seen in Table XV. Of the boats owned by Bristol Bay resident captains, 61.5% hold less than 3,000 fish, whereas 80% of boats owned by other Alaskans and 74.2% of boats owned by non-Alaskans hold more than 3,000 fish.

The difference in value between local and non-local fishing vessels is evident in Table XVI. 66.7% of local owners have boats whose estimated value was <\$10,000. By contrast, the majority of non-local fishermen (75% of other Alaskans, and 60% of non-Alaskans) have vessels whose purchase value exceeded \$21,000. It should also be noted from Table XIV that some local permit-holders, who were encountered during the village surveys, had formerly leased vessels from the cannery but had been recently cut off and are now without any vessel.

Residents of Bristol Bay also tend to have rather poorly-equipped vessels. Table XVII shows the numbers of shackles of net

owned by fishermen from different regions. Three shackles of gillnet may be fished at a time. A full 50% of local captains have only between 1-3 shackles, whereas the majority of non-local fishermen (60% of other Alaskans and 72% of non-Alaskans) have more than 3 shackles. Non-local fishermen thus have spare gear in case of loss or damage in mid-season.

I examined cultural as well as economic differences between groups of fishermen. LE places the fishery on a basis of individual ownership, which may be contrary to the cultural patterns of certain ethnic groups. As seen in Table XVIII most non-ethnic fishermen own their own vessels. Of the ethnic Italian, Croatian, and Scandinavian captains, the largest fraction (47.8%) lease their vessel, and only slightly more than half of the remainder own their vessel outright. Among native-Alaskan captains, approximately the same percentage (29.4%) own their vessel fully, but the remainder are almost equally split between those leasing (29.4%) and those involved in partnerships (23.5%). A smaller fraction of the ethnic captains are involved in partnerships (13.0%).

Transmission of fishing rights

The question of how the transmission of fishing rights to succeeding generations is influenced by LE was addressed in detail. The survey examined relative family size among different groups, since the LE permit may be transmitted to only one person; the career-goals of respondents for their children, particularly in relation to fishing; and the respondents' assessment of whether their children would be

able to obtain LE permits. The relative success of local residents to obtain LE permits was examined directly in the village surveys.

Table XIX shows the number of sons that respondents have by residence. Approximately the same percentage of respondents have one or two sons, irrespective of place of residence. However, the percentage having three or more sons is higher among local residents (19%) than among outsiders (ca. 8%). Native Alaskans are noted to have large families (Kresge, *et al.*, 1974). Among outsiders, almost half of the respondents have no sons whereas only 31% of local residents have no sons.

Table XX shows the number of sons of captains engaged in fishing according to the residence of the captain. The percentage of captains with no sons fishing is approximately 75%, irrespective of the place of residence (significance = .90). Among the captains whose sons are fishing, there is little difference according to the place of residence.

Captains were also asked whether they wanted their sons to fish or not. The response are shown in Tables XXI and XXII for sons under 18 and sons 18 and over, respectively. Local residents with sons were virtually unanimous in wanting their sons to fish. However, non-local fishermen were fairly evenly divided, approximately as many wanting their sons to enter another field as wanted their sons to fish. Non-local fishermen often indicated they wanted their sons to attend college; others indicated they would not mind if their sons fished, but did not want them to be fishermen.

Captains were also asked whether they thought that their young sons might have trouble obtaining permits, but so few captains had young sons that the results of this question may not be significant. Respondents appeared to be split on the issue, as shown in Table XXIII, there was approximately equal division among captains who thought that their young sons would be able to obtain permits by one means or another and captains who thought their sons would not be able to obtain permits. This issue is further explored below in relation to the village survey.

Survey of local villages

In addition to conducting interviews of fishing captains, surveys of four local villages were also carried out. The heads of households were asked questions concerning all members of the household, but only results dealing with the male population are presented here since it is the males who are predominantly involved in the fishery.

Table XXIV shows the percentage of males in each of seven age groups who are presently fishing in Bristol Bay for some time in the year. The percentage of fishermen increases with age, being highest in the 25-35 year-old age group (66.7%). Approximately one-third of males under the age of 18 and one-third of those over the age of 51 are also engaged in fishing. Of the total male population, 45.4% fish in Bristol Bay.

Table XXV shows the type of employment in which males of working age (18-65) are engaged. The largest fraction of males (40.9%) depend upon part-time employment; many of these men are so employed in

addition to fishing. Of working-age males, 15.2% are dependent solely upon fishing as a source of income, and 18.2% are either unemployed or are receiving welfare. The remaining fraction of men (approximately 25%) are skilled workers of one type or another.

Table XXVI summarizes the fishing permit history of working-age males in the villages. Approximately one-third (34.9%) hold permits, the majority of these being drift permits. Of the permit holders, approximately one-half are entirely dependent upon fishing for their income (Table XXV). Only 30.3% of the population initially obtained permits when limited entry legislation came into effect, so there has been a very slight increase in the number of permit holders since 1974. However, a substantial percentage (28.8%) of working-age males have applied for permits since 1974, and approximately 75% of these permit applications have been denied. Furthermore, only a very small percentage (6.1%) have sought to appeal this denial.

The situation of local males 18-35 is particularly striking. Overall, 85% of local males 18-24 and 72% between the ages of 18-35 have no permits. 74% of males 18-35 have not applied for permits, although two-thirds of the men in this age group fish in Bristol Bay. Legal advisors who visited the villages apparently discouraged men from applying for permits if they did not have the requisite experience as captains prior to 1974. Young men have no doubt also been influenced by the poor success of those in that age bracket who have applied: of 9 applications filed besides those originally received (7 for drift permits, 2 for setnet permits), only one setnet permit was received in the four villages surveyed. This single instance of success only followed a highly determined and costly

pursuit of the case by the interested party and his family.

It became apparent through informal discussions with local residents that their considerable dependence on seasonal employment has in many instances actually placed them at a disadvantage in terms of gaining the requisite experience for a LE permit. The 1972-74 fishing seasons had particularly poor runs, and this was predicted well in advance. Local residents who had alternative forms of seasonal employment, such as firefighting for the Bureau of Land Management, often chose not to fish. Non-local fishermen, on the other hand, could "afford" to fish Bristol Bay during those years, since they have other sources of income. The LE Commission, however, weighted 1971-72 more heavily than other years. As a result, enterprising local fishermen who developed alternative forms of income for the poor salmon years now often find themselves unable to return to fishing. This pattern was seen clearly in the village of Nondalton, whose residents are locally renowned as firefighters. However, they consider themselves primarily to be fishermen. But largely as a result of their firefighting activity in the early 1970's, there are now only 7 permits in this entire village of 37 households.

Opinions on Limited Entry

All respondents were asked to evaluate the effect of LE on their household income (Table XXVII). There is a marked difference between local and non-local fishermen. Of the former, more than 40% consider that their income has decreased since the institution of LE, 35.5% perceive no change, and 6.4% feel that their income has

increased. By contrast, many non-Alaskans consider that they have profited from LE: although 42.1% see no change, more than 30% have experienced a rise in income. Discussions with local residents indicated that they perceived a decline in household income due to LE primarily because fewer members of each household are now able to fish.

These differences between local and non-local fishermen are reflected in their opinions as to whether LE should be modified. Table XXIV shows that only 6.5% of local residents are in favor of having LE continue in its present form, whereas approximately 40% of the non-local fishermen are in favor of the status quo. Approximately 50% of all respondents believed that LE should be modified, and almost 20% of Alaskans surveyed -- both local and non-local residents -- felt that the law should simply be repealed.

When asked what steps might be taken to modify LE, respondents replied as shown in Table XXVIII. The favored solutions were, in order of importance, to grant more local permits (36.4%); to provide more enforcement (31.8%) and to end the ability to sell or transfer permits (18.2%).

It is important to note, however, that local residents tend to want the present LE system modified in the direction of granting more permits to local people, whereas non-local fishermen tend to emphasize more enforcement of regulations and control of the sale of permits, as well as the issuance of more permits to experienced and local fishermen.

All persons surveyed were asked to identify aspects of LE that they considered favorable (Table XXIX). The most important

favorable aspects of LE were considered to be that LE limits competition (47.3%) and that it limits the amount of gear in the water (36.6%). Few responded that LE improves the fisherman's bargaining position (8.0%), that it secures his position with the cannery (8.0%), that it provides an investment toward retirement (6.3%), or that it keeps non-fishermen out of the fishery (11.6%).

On the other hand, the most criticized aspects of LE were that it inhibits the entry of young people into the fishery (45.5%), that it keeps local people out of the fishery (42.0%), and that it keeps out people with need (31.3%) (Table XXX). Between 67-83% of local residents voiced these three criticisms. Only 13.4% of the respondents had no criticism of the system.

Local residents seem to be at a significant disadvantage within the present LE system. The application procedure requires completion of a lengthy, complex form. Yet 24% of Bristol Bay residents have had no formal education (Kresge, *et al.*, 1974). Various documents (e.g. income tax records, bills of sale, old fish tickets or licenses, etc.) are required to document various parts of the application that are generally not maintained by village residents. In some cases, this may be due to the accidental destruction of records (such as by fire or flooding), but more often villagers have simply not seen the need in the past to maintain records of such documents.

Should an applicant complete and file his application, there is a strong possibility that he will nevertheless be denied the permit. Only a small fraction of those who have been denied permits have actually sought redress. Many villagers were discouraged by the

appeal procedure. Some knew other villagers who had been involved in lengthy and costly appeals to no avail; others indicated that the legal counsel available to them was not sufficiently interested or motivated to help them. In general, villagers are unfamiliar with government procedures.

It should also be noted that the saleability of permits has led to a steady drain of permits from the villages. Between 1975-77 there were 66 permit transactions involving net movement of a permit between Bristol Bay residents and non-local fishermen. Of these, 44 (67%) were permit transfers from local to non-local fishermen; only 23 (33%) were in the other direction (Langdon, unpubl. mss). The Bristol Bay economy is both poor and based on the seasonal salmon fishery. In winter, particularly during the long series of poor fishing years, local residents have often sold their permits in the face of real need. On the other hand, local residents rarely would have the resources to buy back a permit, which are currently advertised for \$75,000.

CONCLUSIONS

The Alaska LE system is having a significant impact on the fishermen and residents of Bristol Bay. Ironically, the policy is proving more deleterious to the marginal local fishing economies that it was ostensibly implemented to aid. While the system is helping to maintain higher fishing incomes in an era of better runs and improved market conditions, the present system is clearly in need of reform.

While fisheries in general are of equivalent importance to all the major fishery groups in Bristol Bay, local residents are most

dependent upon the Bristol Bay fishery in particular. However, non-local fishermen are clearly benefitting most from the present system. They tend to have larger, more expensive vessels than local fishermen; their boats are better equipped and tend to have a greater fish capacity. By limiting the entry of additional fishermen, LE at present greatly benefits the non-local fisherman.

On the other hand, almost half of the local male residents are involved in the fishery, and a large fraction of them derive their entire income from the Bristol Bay fishery. However, LE appears to be significantly restricting economic opportunity for local people. The majority of local households report either no change or a decline in income as a result of LE. This is typically ascribed to the LE system's excluding members of the household from operating their own boat or from being able to fish altogether. This results in large part from the local resident's being educationally and culturally disadvantaged in working with a complex form requiring extensive documentation. The LE point system also discriminates against fishermen who could not "afford" to fish during the poor years in the early 1970's and who were able to find alternative seasonal employment. Local poverty -- and the questionable provision that allows LE permits to be sold -- has furthermore led to a drain of permits out of the local fishing grounds.

Perhaps the most serious aspect of the present Alaskan LE system, however, is its impact upon young people in local communities, who find it difficult to obtain LE permits. This problem is

aggravated by the large size of the typical local household, the lack of alternative opportunities locally, and the inadequate preparation the people receive to compete in the outside world. Insofar as salmon fishing is the economic base for the village way of life, it is essential that adult members of the community have access to the fishery. In the past, young men served an apprenticeship under their father or other relative until they established themselves as adults in the community. They then obtained their own boat. However, without provision for new permits to be issued, there is no means by which young people can attain economic independence in the village under LE. This problem is evident today among those in their early twenties, who were serving their apprenticeships as crewmen in the fishery at the time LE was enacted and who, therefore, did not qualify for licenses under the LE point system. Today they are raising their own families but are barred from fishing their own vessels and must scramble to serve as crew members with friends and relatives. Local families are large. Clearly this problem will become more severe with time. If unalleviated, it must lead to the disintegration of village life through increased dependence on a debilitating welfare system and outmigration.

While most captains agreed that LE limits competition and also limits the amount of fishing gear in the water, and that these were favorable changes in the fishery, there was a great deal of criticism of LE. The central problems were perceived to be that LE prevents young people, local residents, and those who are in need from taking

part in the fishery. The most frequently-suggested solutions were that more local permits should be granted, and that the sale of permits be prohibited.

In closing, it should be noted that certain aspects of the present LE system could not be examined in the context of the present study. Discussions with fishermen revealed allegations of widespread use of illegal permits and of fishing without a permit. The extent of this problem could not be ascertained. However, some local residents admitted to fishing illegally and expressed the view that they were forced to do so because of the lack of alternatives and the difficulty involved in obtaining a legal permit. Clearly the LE system should be more strongly enforced only after the injustices have been removed.

RECOMMENDATIONS

The entry of young local people into the fishery presents the gravest problem with the current LE system. The system must make accommodations for local persons and young people who are committed to and dependent upon fishing as a way of life. Fishermen from outside the Bristol Bay region appear to be increasingly dominating the local fishery since LE legislation was enacted, yet it is the local people who most depend upon the resource. The following specific recommendations are proposed as steps towards correcting present problems with LE:

1. The transferrability of permits should be revoked. If a permit is not used within three years of its acquisition it then returns to the state.

2. The point system for granting permits should be revised to allow persons filing for a new permit to receive points for their experience as crewmen. This would encourage the continuation of the tradition of apprenticeship of young people in the fishery.
3. Provisions should be made for the issuance of interim permits granted on the basis of hardship, particularly to local residents. Otherwise persons currently faced with the prospect of no employment may resort to fishing illegally.
4. Bureaucratic procedures should be revised so that persons without records who live in rural areas but who are dependent on fishing may receive a permit.

If the above recommendations are instituted, the LE system would be improved. If the sale and transfer of permits is prohibited the present speculative market in the permits will cease. This should also end the present flow of permits out of local communities. By permitting a period of three years for the permit to lapse, fishermen will not be compelled to fish during periods when fish stocks are low.

If points are granted for experience as a crewman during recent years, the major problem of entry of young people into the fishery may be corrected. Encouraging a 3-5-year apprenticeship period would not only help young people enter the fishery, it would ensure that those persons receiving new permits had adequate experience in fishing the local waters. The benefits of such an apprenticeship

program, in terms of both efficiency and safety, are self-evident.

Hardship interim permits would serve a useful purpose. Persons who must depend upon fishing due to temporary unfavorable circumstances would not be forced to fish illegally. Infringement of the law could be prevented at the same time as providing a much-needed source of income for the temporary fisherman.

It is not clear how the present system could be altered to allow the granting of permits to those not having complete records of their fishing history. However, it is evident that some persons who have been largely dependent upon fishing in the past were denied permits due to the lack of sufficient documentation. These cases must not be overlooked, and some attempt should be made to allow for the entry of such persons into the fishery.

In conclusion, the outcome of the present LE system is sadly ironic. It is leading to the progressive deterioration of local economies and life-styles by diminishing local resident's access to the region's primary economic resource. This situation can -- and must be -- corrected.

ACKNOWLEDGMENTS

I thank the Center for Field Research, under whose auspices an EARTHWATCH team of six volunteers was formed for the purpose of funding the project and performing a large part of the work. F. Bristol, R. Higgins and M. K. Gilliland (logistical coordinator) proved invaluable field workers. Additional support was provided by the Institute of Marine Resources, University of California.

I also thank Drs. D. Philips and F. Bailey, members of the Social Science faculties at University of California, San Diego, and Professor J. Isaacs, Director of the Institute of Marine Resources. The state legislature of Alaska provided continued support and encouragement. J. Star helped with the programming of interview data and M. Huntley assisted in writing the field report.

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NOTE ON THE PRESENTATION OF TABLES

Unless otherwise indicated, all tables are presented in the format shown in Table I. Using Table I as an example, the format can be explained as follows: Table I shows the ethnic origin of the questionnaire respondents, according to whether the ethnic origin was native-American, "ethnic", or "other", and according to whether the respondent was a captain, a crew member, or a village resident. For each combination of ethnic origin and questionnaire respondent, three numbers are shown. Taking the example of captains who are natives (left uppermost set of numbers in the table), the uppermost number shows the actual number of respondents falling into this category (8). The number below this (17.4) is the row percentage - in this case showing that 17.4% of the captains are native-Americans (note that in the "captains" row 50% are "ethnic", and 32.6% are "other"). The bottommost number (14.3) is the column percentage - in this case showing that 14.3% of the native-Americans are captains (note that in the "native" column, 3.7% are crewmen, and 81.5% are village residents). The column totals are shown below each column, the uppermost number being the actual number of respondents (54 "natives", 29 "ethnic", and 27 "other"), and the lowermost number being the percent total (49.1% of respondents are "natives", 26.4% are "ethnic", and 24.5% are "other"). Similarly, the row totals are shown at the far right of the table in the same format. The row totals show that, of all the respondents, 46 (41.8% are captains, 9 (8.2%) are crewmen, and 55 (50.0%) are village residents. At the bottom right of the table the total is shown - i.e., 110 respondents made up 100% of the total.

Some tables are shown in simpler format. In these, the actual numbers of respondents are shown in parentheses above the percentages (see Table XXIV for example).

Table I. Ethnic origins of the questionnaire respondents. "Native" refers to native-Americans and "ethnic" refers to persons with Italian, Croatian, or Scandinavian ancestry.

<u>QUESTIONNAIRE TYPE</u>	<u>ETHNIC ORIGIN</u>			<u>ROW TOTAL</u>
	<u>NATIVE</u>	<u>ETHNIC</u>	<u>OTHER</u>	
Captain	8	23	15	46
	17.4	50.0	32.6	41.8
	14.8	79.3	55.6	
Crew	2	5	2	9
	22.2	55.6	22.2	8.2
	3.7	17.2	7.4	
Village Survey	44	1	10	55
	80.0	1.8	18.2	50.0
	81.5	3.4	37.0	
Column Total	54	29	27	110
	49.1	26.4	24.5	100.0

Table II. Place of residence of the questionnaire respondents,
according to whether respondents were captains, crewmen, or
residents of one of the four local villages surveyed.

<u>RESIDENCE</u>	<u>QUESTIONNAIRE TYPE</u>			<u>ROW TOTAL</u>
	<u>CAPTAIN</u>	<u>CREW</u>	<u>VILLAGE</u>	
Bristol Bay	5	2	55	62
	8.1	3.2	88.7	54.9
	10.6	22.2	96.5	
Greater Alaska	10	1	1	12
	83.3	8.3	8.3	10.6
	21.3	11.1	1.8	
California	20	4	0	24
	83.3	16.7	0.0	21.2
	42.6	44.4	0.0	
Oregon/Washington	9	2	0	11
	81.8	18.2	0.0	9.7
	19.1	22.2	0.0	
Other	3	0	0	3
	100.0	0.0	0.0	2.7
	6.4	0.0	0.0	
Unknown	0	0	1	1
	0.0	0.0	100.0	0.9
	0.0	0.0	1.8	
Column Total	47	9	57	113
	41.6	8.0	50.6	100.0

Table III. Age distribution of respondents according to place of residence. Residence is shown according to whether it is local (Bristol Bay), in greater Alaska, or outside Alaska. Age categories are: 24 years or younger; 25-35; 36-50; 51-65; and >65.

<u>AGE</u>	<u>RESIDENCE</u>			<u>Row Total</u>
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
<u>≤ 24</u>	9	2	7	18
	50.0	11.1	38.9	16.7
	15.3	18.2	18.4	
25-35	14	1	7	22
	63.6	4.5	31.8	20.4
	23.7	9.1	18.4	
36-50	18	2	10	30
	60.0	6.7	33.3	27.8
	30.5	18.2	26.3	
51-65	9	4	12	25
	36.0	16.0	48.0	23.1
	15.3	36.4	31.6	
>65	9	2	2	13
	69.2	15.4	15.4	12.0
	15.3	18.2	5.3	
Column Total	59	11	38	108
	54.6	10.2	35.2	100.0

Table IV. Age distribution of respondents according to whether respondents were captains, crewmen, or local villagers. Age categories as in Table III.

<u>AGE</u>	<u>QUESTIONNAIRE RESPONDENTS</u>			<u>Row Total</u>
	<u>Captains</u>	<u>Crew</u>	<u>Villagers</u>	
≤ 24	7	2	9	18
	38.9	11.1	50.0	16.5
	15.2	22.2	16.7	
25-35	6	4	12	22
	27.3	18.2	54.5	20.2
	13.0	44.4	22.2	
36-50	14	0	17	31
	45.2	0.0	54.8	28.4
	30.4	0.0	31.5	
51-65	15	3	7	25
	60.0	12.0	28.0	22.9
	32.6	33.3	13.0	
> 65	4	0	9	13
	30.8	0.0	69.2	11.9
	8.7	0.0	16.7	
Column Total	46	9	54	109
	42.2	8.3	49.5	100.0

Table V. Occupations of captains during that part of the year when they are not fishing, according to the place of residence (Bristol Bay, Alaska, or outside Alaska).

Occupation when not fishing	RESIDENCE			Row Total
	Bristol Bay	Greater Alaska	Outside Alaska	
Vacation	8	1	4	13
	61.5	7.7	30.8	12.4
	14.3	9.1	10.5	
Fishing	1	1	6	8
	12.5	12.5	75.0	7.6
	1.8	9.1	15.8	
Rural	16	0	1	17
	94.1	0.0	5.9	16.2
	28.6	0.0	2.6	
Own business	3	2	4	9
	33.3	22.2	44.4	8.6
	5.4	18.2	10.5	
Blue Collar	7	4	15	26
	26.9	15.4	57.7	24.8
	12.5	36.4	39.5	
White Collar	7	0	3	10
	70.0	0.0	30.0	9.5
	12.5	0.0	7.9	
Student	1	2	2	5
	20.0	40.0	40.0	4.8
	1.8	18.2	5.3	
Profession	3	1	1	5
	60.0	20.0	20.0	4.8
	5.4	9.1	2.6	
Other	6	0	0	6
	100.0	0.0	0.0	5.7
	10.7	0.0	0.0	
Not known	4	0	2	6
	66.7	0.0	33.3	5.7
	7.1	0.0	5.3	
Column Total	56	11	38	105
	53.3	10.5	36.2	100.0

Table VI. Number of months out of the year spent fishing by captains,
according to place of residence.

<u>Months spent fishing</u>	RESIDENCE			<u>Row Total</u>
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
1	13 56.5 68.4	4 17.4 36.4	6 26.1 16.2	23 34.3
2	1 7.1 5.3	3 21.4 27.3	10 71.4 27.0	14 20.9
3	1 11.1 5.3	3 33.3 27.3	5 55.6 13.5	9 13.4
4	1 33.3 5.3	0 0.0 0.0	2 66.7 5.4	3 4.5
5	1 50.0 5.3	0 0.0 0.0	1 50.0 2.7	2 3.0
6	1 33.3 5.3	0 0.0 0.0	2 66.7 5.4	3 4.5
7	0 0.0 0.0	0 0.0 0.0	3 100.0 8.1	3 4.5
8	0 0.0 0.0	0 0.0 0.0	1 100.0 2.7	1 1.5
10	0 0.0 0.0	0 0.0 0.0	2 100.0 5.4	2 3.0
11	1 100.0 5.3	0 0.0 0.0	0 0.0 0.0	1 1.5
12	0 0.0 0.0	1 16.7 9.1	5 83.3 11.5	6 9.0
Column Total	19 28.4	11 16.4	37 55.2	67 100.0

Table VII. Number of fisheries other than Bristol Bay in which captains are involved, shown according to place of residence.

<u>Number of other Fisheries Involved in</u>	<u>RESIDENCE</u>			<u>Row Total</u>
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
None	16	10	21	47
	34.0	21.3	44.7	71.2
	94.1	90.9	55.3	
1	0	1	11	12
	0.0	8.3	91.7	18.2
	0.0	9.1	28.9	
2 or more	0	0	5	5
	0.0	0.0	100.0	7.6
	0.0	0.0	13.2	
Not Known	1	0	1	2
	50.0	0.0	50.0	3.0
	5.9	0.0	2.6	
Column Total	17	11	38	66
	25.8	16.7	57.6	100.0

Table VIII. Self-perception of captains as fishermen, according to place of residence.

Do you Consider Yourself a Fisherman?	RESIDENCE			Row Total
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
Yes	13	4	25	42
	31.0	9.5	59.5	62.7
	72.2	36.4	65.8	
No	3	7	12	22
	13.6	31.8	54.5	32.8
	16.7	63.6	31.6	
Not known	2	0	1	3
	66.7	0.0	33.3	4.5
	11.1	0.0	2.6	
Column Total	18	11	38	67
	26.9	16.4	56.7	100.0

Table IX. Fraction of captains' annual income derived from all fishing activity, according to the place of residence.

Fraction of Income Derived From All Fishing	RESIDENCE			Row Total
	Bristol Bay	Greater Alaska	Outside Alaska	
<1/3	2	2	6	10
	20.0	20.0	60.0	18.9
	15.4	22.2	19.4	
1/3-2/3	4	3	10	17
	23.5	17.6	58.8	32.1
	30.8	33.3	32.3	
>2/3	7	4	15	26
	26.9	15.4	57.7	49.1
	53.8	44.4	48.4	
Column Total	13	9	31	53
	24.5	17.0	58.5	100.0

Table X. Fraction of captains' annual income derived from the Bristol Bay fishery alone, according to the place of residence.

Fraction of Income Derived from Bristol Bay	RESIDENCE			Row Total
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
<1/3	2	2	12	16
	12.5	12.5	75.0	31.4
	15.4	25.0	40.0	
1/2-2/3	4	3	12	19
	21.1	15.8	63.2	37.3
	30.8	37.5	40.0	
>2/3	7	3	6	16
	43.8	18.8	37.5	31.4
	53.8	37.5	20.0	
Column Total	13	8	30	51
	25.5	15.7	58.3	100.0

Table XI. Fraction of captains' annual income derived from the Bristol Bay fishery alone, according to ethnic origin. (Ethnic origin as in Table I).

Fraction of Income Derived from Bristol Bay	ETHNIC ORIGIN			ROW TOTAL
	<u>NATIVE</u>	<u>ETHNIC</u>	<u>OTHER</u>	
<1/3	4	8	4	16
	25.0	50.0	25.0	32.0
	25.0	38.1	30.8	
1/3 - 2/3	4	11	3	18
	22.2	61.1	16.7	36.0
	25.0	52.4	23.1	
>2/3	8	2	6	16
	50.0	12.5	37.5	32.0
	50.0	9.5	46.2	
Column Total	16	21	13	50
	32.0	42.0	26.0	100.0

Table XII. Fraction of captains' annual income derived from all fishing activities, according to ethnic origin.

Fraction of Income Derived from All Fishing	ETHNIC ORIGIN			ROW TOTAL
	NATIVE	ETHNIC	OTHER	
<1/3	3	4	3	10
	30.0	40.0	30.0	19.2
	18.3	18.2	21.1	
1/3 - 2/3	4	9	4	17
	23.5	52.9	23.5	32.7
	25.0	40.9	25.5	
>2/3	9	9	7	25
	36.0	36.0	25.1	48.1
	56.3	40.9	50.1	
Column Total	16	22	14	52
	30.8	42.3	26.9	100.0

Table XIII. Annual income of captains derived from the Bristol Bay fishery, according to the place of residence. Categories of annual income are: less than \$5,000, \$5,000-10,000, and greater than \$10,000.

INCOME FROM BRISTOL BAY FISHERY					
	<u>\$5,000</u>	<u>\$5,000- 10,000</u>	<u>>\$10,000</u>	<u>Not Known</u>	<u>Row Total</u>
Bristol Bay	2	3	4	53	62
	3.2	4.8	6.5	85.5	55.4
	40.0	30.0	22.2	67.1	
Greater Alaska	0	2	3	7	12
	0.0	16.7	25.0	58.3	10.7
	0.0	20.0	16.7	8.9	
Outside Alaska	3	5	11	19	38
	7.0	13.2	28.9	50.0	33.9
	<u>60.0</u>	<u>50.0</u>	<u>61.1</u>	<u>24.1</u>	<u> </u>
Column Total	5	10	18	79	112
	45	8.9	16.1	70.5	100.0

Table XIV. Types of fishing vessels operated by captains, according to whether they are local or non-local residents. Captains either had a Bristol Bay gillnetter (32'), a skiff (less than 32'), or no vessel at all.

<u>Type of Fishing Vessel</u>	<u>Local Residents</u>	<u>Non-Local Resident</u>
No Vessel	(2) 14.3	0
Standard (32)	(8) 57.1	(41) 97.6
Skiff (<32')	(4) 28.6	(1) 2.4

Table XV. Capacity of captains' fishing vessels, in terms of the number of fish the vessel can hold, according to the place of residence.

Boat Capacity (# of Fish)	RESIDENCE		
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>
<3000	(8)	(2)	(8)
	61.5	20.0	25.8
>3000	(5)	(8)	(23)
	38.5	80.0	74.2

Table XVI. Value of captains' vessels, in 1,000's of dollars,
according to place of residence

<u>Value of Vessel</u> <u>(1000's of \$)</u>	RESIDENCE			<u>Row</u> <u>Total</u>
	<u>Bristol</u> <u>Bay</u>	<u>Greater</u> <u>Alaska</u>	<u>Outside</u> <u>Alaska</u>	
0	2	0	0	2
	100.0	0.0	0.0	4.4
	16.7	0.0	0.0	
1-10	8	1	2	11
	72.7	9.1	18.2	24.4
	66.7	12.5	8.0	
11-20	1	1	8	10
	10.0	10.0	80.0	22.2
	8.3	12.5	32.0	
21-40	1	2	11	14
	7.1	14.3	78.6	31.1
	8.3	25.0	44.0	
>40	0	4	4	8
	0.0	50.0	50.0	17.8
	0.0	50.0	16.0	
Column Total	12	8	25	45
	26.7	17.8	55.6	100.0

Table XVII. Number of shackles of gear possessed by captains,
according to the place of residence.

<u>Number of Shackles</u>	RESIDENCE			<u>Row Total</u>
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
None	2	0	0	2
	100.0	0.0	0.0	3.6
	14.3	0.0	0.0	
1 - 3	7	4	5	16
	43.8	25.0	31.3	28.6
	50.0	40.0	15.6	
More than 3	5	6	23	34
	14.7	17.6	67.6	60.7
	35.7	60.0	71.9	
Not known	0	0	4	4
	0.0	0.0	100.0	7.1
	0.0	0.0	12.5	
Column Total	14	10	32	56
	25.0	17.9	57.1	100.0

Table XVIII. Breakdown of the ownership of vessels according to the place of residence of the captain. Ownership is either 100% self-owned, leased from a local cannery, owned by a partnership, self-owned but not yet completely paid for, leased from another fisherman, or owned by a corporation.

<u>Ownership of Boat</u>	<u>Native</u>	<u>Ethnic</u>	<u>Other</u>	<u>Row Total</u>
No Boat	2 100.0 11.8	0 0.0 0.0	0 0.0 0.0	2 3.6
100% Self	5 29.4 29.4	6 35.3 26.1	6 35.3 40.0	17 30.9
Leased	5 27.8 29.4	11 61.1 47.8	2 11.1 13.3	18 32.7
Partnership	4 44.4 23.5	3 33.3 13.0	2 22.2 13.3	9 16.4
Self-Owned not paid off	0 0.0 0.0	1 33.3 4.3	2 66.7 13.3	3 5.5
Lease - other person	0 0.0 0.0	2 50.0 8.7	2 50.0 13.3	4 7.3
Corporation	1 100.0 5.9	0 0.0 0.0	0 0.0 0.0	1 1.8
Not Known	0 0.0 0.0	0 0.0 0.0	1 100.0 3.1	1 1.8
Column Total	17 30.9	23 41.8	15 27.3	55 100.0

Table XIX. Number of sons which respondents have, according to the place of residence of the respondent. This table included the respondents to all questionnaires.

<u>Number of Sons</u>	RESIDENCE			<u>Row Total</u>
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
None	15	6	16	37
	40.5	16.2	43.2	33.0
	24.2	50.0	42.1	
1	15	3	14	32
	46.9	9.4	43.8	28.6
	24.2	25.0	36.8	
2	9	2	5	16
	56.3	12.5	31.3	14.3
	14.5	16.7	13.2	
3	9	1	3	13
	69.2	7.7	23.1	11.6
	14.5	8.3	7.9	
Not known	14	0	0	14
	100.0	0.0	0.0	12.5
	22.6	0.0	0.0	
Column Total	62	12	38	112
	55.4	10.7	33.9	100.0

Table XX. Number of sons of captains who are involved in fishing,
according to the residence of the captain.

<u>Number of sons fishing</u>	RESIDENCE			<u>Row Total</u>
	<u>Bristol Bay</u>	<u>Greater Alaska</u>	<u>Outside Alaska</u>	
None	14	9	27	50
	28.0	18.0	54.0	74.6
	77.8	81.8	71.1	
1	2	0	5	7
	26.6	0.0	71.4	10.4
	11.1	0.0	13.2	
2	2	2	4	8
	25.0	25.0	50.0	11.9
	11.1	18.2	10.5	
3	0	0	1	1
	0.0	0.0	100.0	1.5
	0.0	0.0	2.6	
Not known	0	0	1	1
	0.0	0.0	100.0	1.5
	0.0	0.0	2.6	
Column Total	<u>18</u>	<u>11</u>	<u>38</u>	<u>67</u>
	26.9	16.4	56.7	100.0

Table XXI. Response of captains to the question "Do you want your young sons, less than 18 years of age, to be fishermen?", according to the residence of the captain. Answers were either "yes", "no", "I don't care", or "I want him to fish, but I don't necessarily want him to be a fisherman."

Do you want your young sons (<18) to be fishermen?	RESIDENCE			Row Total
	Bristol Bay	Greater Alaska	Outside Alaska	
No young sons	7 16.7 38.9	8 19.0 72.7	27 64.3 71.1	42 62.7
Yes	5 55.6 27.8	1 11.1 9.1	3 33.3 7.9	9 13.4
No	1 14.3 5.6	0 0.0 0.0	6 85.7 15.8	7 10.4
Don't care	3 75.0 16.7	1 25.0 9.1	0 0.0 0.0	4 6.0
Want him to fish, but not necessarily to be a fisherman	0 0.0 0.0	1 50.0 9.1	1 50.0 2.6	2 3.0
Not known	2 66.7 11.1	0 0.0 0.0	1 33.3 2.6	3 4.5
Column Total	18 26.9	11 16.4	38 56.7	67 100.0

Table XXII. Response of captains to the question "Do you want your older sons, older than 18 years of age, to be fishermen?", according to residence of the captain. Responses as in Table XXI.

Do you want your older sons (>18) to be fishermen?	RESIDENCE			Row Total
	Bristol Bay	Greater Alaska	Outside Alaska	
No sons over 18	11 25.6 61.1	8 18.6 72.7	24 55.8 63.2	43 64.2
Yes	3 42.9 16.7	0 0.0 0.0	4 57.1 10.5	7 10.4
No	0 0.0 0.0	0 0.0 0.0	2 100.0 5.3	2 3.0
Don't care	2 33.3 11.1	1 16.7 9.1	3 50.0 7.9	6 9.0
To fish, not to be fishermen	0 0.0 0.0	1 100.0 9.1	0 0.0 0.0	1 1.5
Not known	2 25.0 11.1	1 12.5 9.1	5 62.5 13.2	8 11.9
Column Total	18 26.9	11 16.4	38 56.7	67 100.0

Table XXIII. Response of captains to the question "Will your young sons be able to obtain permits?", according to the residence of the captain. Answers were "yes, he could buy one", "yes, he will receive my permit", "no, probably not", or "no, he doesn't want to fish."

Will your young sons be able to obtain permits?	RESIDENCE			Row Total
	Bristol Bay	Greater Alaska	Outside Alaska	
No young sons	7 15.6 38.9	8 17.8 72.7	30 66.7 78.9	45 67.2
Yes: buy one	1 33.3 5.6	2 66.7 18.2	0 0.0 0.0	3 4.5
Yes: mine	2 40.0 11.1	1 20.0 9.1	2 40.0 5.3	5 7.5
No, or probably not	2 66.7 11.1	0 0.0 0.0	1 33.3 2.6	3 4.5
Don't want to fish	3 100.0 16.7	0 0.0 0.0	0 0.0 0.0	3 4.5
Not known	3 37.5 16.7	0 0.0 0.0	5 62.5 13.2	8 11.9
Column Total	18 26.9	11 16.4	38 56.7	67 100.0

Table XXIV. Age distribution of male villagers who fish in Bristol Bay for some portion of the year.

Age categories are: less than 11, 12-17, 18-24, 25-35, 36-50, 51-65 and >65.

	AGE-GROUP							<u>Total Percentage</u>	<u>Total Respondents</u>
	<u>0-11</u>	<u>12-17</u>	<u>18-24</u>	<u>25-35</u>	<u>36-50</u>	<u>51-65</u>	<u>> 65</u>		
% of Males in Age-Group who fish Bristol Bay	(2)	(6)	(16)	(8)	(12)	(3)	(2)	(49)	
	10.5	40.0	59.3	66.7	63.2	37.5	25.0	45.4	108

Table XXV. Type of employment in which male villagers of working age (18-65) are engaged during that time of the year when they are not fishing.

TYPE OF EMPLOYMENT	% OF AGE GROUP IN MALE POPULATION				TOTAL
	18-24	25-35	36-50	51-65	
Fishing only	18.5	33.3	5.3	(0) 0.0	15.2
Unemployed/ Welfare	18.5	8.3	10.5	50.0	18.2
Part-Time	48.1	41.7	36.8	25.0	40.9
White Collar	3.7	8.3	10.5	25.0	9.1
Blue Collar	3.7	(0) 0.0	21.1	(0) 0.0	7.6
Other (Student, Professional, Self-Employed)	7.4	8.3	15.8	(0) 0.0	9.1

Table XXVI. Permit history of working age male villagers, showing the number of permits held, the numbers of permits obtained at the initiation of LE, permits since transferred or sold, permits since bought or received, permits applied for, permits denied, and permits on appeal.

	% of Age Group in Male Population				<u>Total</u>
	<u>18-24</u>	<u>25-35</u>	<u>36-50</u>	<u>51-65</u>	
Permits Held	14.8	50.0	47.4	50.0	34.8
Permits Initially Obtained	3.7	50.0	36.8	75.0	30.3
Permits Sold or Transferred	3.7	8.3	10.5	37.5	10.6
Permits Bought or Received	11.1	8.3	5.3	12.5	9.1
Permits Applied For	25.9	25.0	36.8	25.0	28.8
Permits Denied	22.2	25.0	15.8	25.0	21.2
Permits on Appeal	<u>7.4</u>	<u>0.0</u>	<u>5.3</u>	<u>12.5</u>	<u>6.1</u>
Total Number of Respondents	27	12	19	8	66

Table XXVII. Effect of limited entry on the household income,
according to the place of residence. Effects are shown
as significant or slight decreases, no change, or
significant or slight increases.

Effect of LE on household income	RESIDENCE			Row Total
	Bristol Bay	Greater Alaska	Outside Alaska	
DECREASE	Significant	20	0	20
		100.0	0.0	17.9
		32.3	0.0	
	Slight	5	1	7
		71.4	14.3	6.3
		8.1	2.6	
NO CHANGE		22	4	42
		52.4	9.5	37.5
		35.5	33.3	
INCREASE	Slight	2	3	12
		16.7	25.0	10.7
		3.2	25.0	
	Significant	2	5	7
		28.6	71.4	6.3
		3.2	13.2	
Unknown		11	4	24
		45.8	16.7	21.4
		17.7	33.3	
Column Total		62	12	112
		55.4	10.7	
			33.9	100.0

Table XXVIII. Modifications to LE suggested by respondents.

Modification Suggested	% of Respondents Suggesting Modification		
	Local Residents	Non-Local Residents	Total
Grant more Local Permits	(12) 27.3	(4) 9.1	(16) 36.4
Provide more Enforcement	(6) 13.6	(8) 18.2	(14) 31.8
End Ability to Sell or Transfer Permits	(4) 9.1	(4) 9.1	(8) 18.2
Issue no more Permits	(1) 2.3	(5) 11.4	(6) 13.6
Total	(23) 52.3	(21) 47.7	(44) 100

Table XXIX. Categories of responses given to question, "What aspects of LE do you favor, if any?"

Aspect Favored	% of Respondents Favoring Aspects of LE
Limits competition	(53) 47.3
Limits gear	(41) 36.6
Improves fisherman's bargaining position	(9) 8.0
Secures position with cannery	(9) 8.0
Provides investment towards retirement	(7) 6.3
Keeps out non-fishermen	(13) 11.6
Nothing advantageous	(15) 13.4

Table XXX. Categories of responses given to question, "What aspects of LE are you opposed to, if any?"

Aspect Criticised	% of Respondents Critical of Aspects of L.E.
No criticism	(15) 13.4
Keeps out local people	(47) 42.0
Keeps out people with need	(35) 31.3
Inhibits entry of young people	(51) 45.5

A Sociological Study of Limited Entry in the
Bristol Bay Salmon Fishery:

A Preliminary report on field work conducted
in Summer 1979

by

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(This is a preliminary report -- not to be quoted or cited without
permission of the author)

villages, Naknek and South Naknek, for their market, services and, most important, their housing, which greatly facilitates sampling the fishing population. LE has been in effect in Bristol Bay since 1974, giving sufficient time for its impact to emerge. Bristol Bay seemed particularly apt for a study of this question since Crutchfield and Pontecorvo (1969) used this salmon fishery as their prime example of a fishery particularly in need of LE. I am also personally familiar with the fishery, having fished the Bristol Bay sockeye run myself for two seasons (1970-71).

The Center for Field Research seemed ideally suited to enable me to undertake this project. The Bristol Bay sockeye run is not only the world's largest -- it is also one of the most intense, taking place in less than a month's time. I therefore required additional personnel if I was to interview a sufficient number of fishermen during the brief fishing season. Also, while I was able to enlist additional support from the Institute of Marine Resources, University of California, San Diego, most traditional funding agencies were wary of supporting a marine ecologist undertaking his first project in the social sciences. It should be noted, however, that this work has received continued support and encouragement from Drs. David Phillips and Frederick Bailey, members of the Social Science faculties of the University of California, San Diego, and Prof. John Isaacs, Director of the Institute of Marine Resources. Through the Center for Field Research, an EARTHWATCH team of six volunteers was formed, who funded and helped perform the greater part of the work during the 1979 field season in Bristol Bay.

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Fisheries in western countries have traditionally been open to all who obtained the necessary license and gear. In recent decades resource economists have argued that this arrangement leads to economic inefficiency -- namely, that the harvest of open-access resources tends toward an equilibrium where no profit is realized, since so long as there is a profit to be made, additional persons will enter to exploit the resource (Gordon 1955, Crutchfield and Pontecorvo 1969). Impressed by this argument, fishery managers have placed a number of fisheries under a radically different regulatory regime known as "limited entry" (LE). Under LE management, the number of fishermen harvesting a particular resource is limited, usually to the present license-holders. However, the broader socioeconomic impact of this change in the structure of fisheries has not yet been examined. In particular, questions arise as to how LE policies will affect the transmission of fisheries to succeeding generations, particularly in traditional fishing communities, as well as to the general relationship between such policies and traditional fishing strategies and life-styles.

I proposed a survey of the Bristol Bay salmon fishermen in order to examine some of the social, economic, and cultural implications of LE. This fishery was particularly appropriate for study for several reasons. Several of the major fishery groups in America are well represented there; both full- and part-time fishermen, ethnic Italian, Scandinavian, and native-American fishermen, as well as many non-ethnic fishermen. Because of its isolation, the fishermen in Bristol Bay are dependent upon a relatively few canneries located in two fishing

7

Ten days prior to the arrival of the volunteers, I flew to Naknek with my logistical coordinator for the summer, Mary Kay Gilliland, a first-year graduate student in anthropology at the University of California, San Diego, in order to lay the groundwork for the summer's field work. I had earlier written the various canners there about the possibilities of obtaining housing with them and of enlisting their cooperation with my research, but my queries had all gone unanswered. Mary and I therefore had to obtain housing and establish working relationships with the canners and fishermen, as well as to pre-test and revise the questionnaire.

I obtained complete lists of the fishermen under contract with six of the eight major canners in the Naknek area. These lists were divided into those fishermen with original permits and those whose permits were obtained later, primarily through sale or transfer. Stratified random samples were then based upon these lists. Fishermen were interviewed at five of the canneries -- the list from the sixth cannery was obtained too late in the season to be of real value. However, the same ethnic and demographic groups of fishermen were generally found at the different canneries.

The interviews with the fishermen were based upon a standard questionnaire with both open- and close-ended questions that covered the respondent's basic demographic characteristics; the characteristics of the vessel and gear he used in Bristol Bay; his own and his family's involvement in fisheries, particularly in Bristol Bay; the impact of LE on his household's fishing income and fishing strategy; and his views on LE and its impact on various groups of participants. The

questionnaire form was critically reviewed initially by Drs. D. Phillips and F. Bailey and was pre-tested, revised, and partially re-printed in Naknek. The interviews took approximately one hour to administer. Cooperation from the fishermen was generally excellent, although some of the local villagers found the questions difficult. However, this may be indicative of some of the very problems local residents encountered with the complex LE system itself.

I originally intended to limit the study to fishing captains (i.e. permit holders). However, I found during the initial ten-day period prior to the arrival of the volunteers that the most serious problems of the Alaskan LE system were found among old-time crew-members, who were not eligible to receive the permits, and the Bristol Bay residents, many of whom considered themselves, their families and communities deprived of full access to the resource. An ancillary questionnaire was therefore developed to be administered to all crew members on vessels chosen for the survey, who had fished in Bristol Bay for five years or longer. It was also found that the Bristol Bay residents formed a minority of the Bristol Bay fishing fleet. In order to represent their views adequately -- and also to determine the extent to which their claim of deprivation was justified -- another questionnaire was developed to be administered as a household survey. This latter survey was first conducted in Naknek and South Naknek, where it was based upon the Borough Tax Assessor's maps and property lists. At the end of the main sockeye run, when most fishermen returned to their homes, I administered this questionnaire in two

upriver villages as well -- Nondalton and Kokhanok. Funds for this latter work were provided by the Institute of Marine Resources. All village surveys were based on systematic samples -- censusing between one in two to one in five households -- based upon complete lists or maps of the area. At least ten households were surveyed in each of the four villages.

Just over 50 fishermen and over 50 local households were surveyed during the field season. The field samples were carefully drawn, so I am confident we interviewed a representative cross-section of the residents and legitimate fishermen. The different groups engaged in the fishery each appear to be remarkably homogeneous in their outlooks on the LE system. I hope this will permit me to generalize with some confidence about the different group characteristics, despite the relatively small sample size. However, I cannot determine this until the interviews are analyzed. The data from the interviews are now being computerized for statistical analysis. A number of less structured interviews and informal discussions were also conducted with representatives of the salmon industry and fishermen's marketing associations, as well as with numerous fishermen and residents on a casual basis. Field journals of these interviews and contacts were maintained by Ms. Gilliland and myself. The final report on the project will synthesize the quantitative and qualitative aspects of our study and should be complete before the end of the year.

Preliminary Results

Eligibility for a permit under the Alaskan LE system was based

on a point system. Points were obtained for ownership of gear and vessel, residence in a rural area of Alaska, and income dependence on the fishery, as well as participation in the fishery. Twice as many points were allotted for having been the captain (i.e., the gear license holder) of a fishing vessel than for having served as a crew member. Points could only be obtained for the years fished between 1965 and 1972, with the latter years being weighted more heavily. Applications had to be documented by records, such as income tax forms, old licenses, etc. Generally, to be eligible required having been a captain on a fishing vessel in the years immediately prior to the institution of the LE system, provable by written documentation. A strict deadline was established within several months of the promulgation of the system, although applications were accepted again several years later. No new permits are being issued at this time. Without an LE permit one cannot operate a fishing vessel in the particular fishery. While it must be renewed each year it is fully saleable and transferrable. Once sold, of course, it cannot be obtained again.

The fishing community can be divided into several groups clearly characterized by certain interests and views on LE. The non-local (i.e., non-Bristol Bay resident) fishermen overwhelmingly favor the LE system. This group includes the ethnic Italian fishermen, predominantly from California, Scandinavian-American fishermen from the Pacific Northwest, and fishermen from other parts of Alaska. Fishing is viewed by these fishermen as a business and LE serves predominantly to protect their financial position in the fishery in several ways.

On the other hand, fishing provides the economic base for the village way of life for many Bristol Bay residents -- predominantly native-Americans. Many local residents now find this way of life threatened by the LE system.

Non-local fishermen are committed to LE in large part as a result of a variety of conditions external to the LE system, which have greatly improved the biological and economic condition of the Bristol Bay salmon resource (and many other Alaskan fisheries as well). LE serves primarily to protect these gains. Climatic conditions have ameliorated in recent years leading to better runs following the worst runs of the century earlier in the decade. Competition for the resource has been reduced following the exclusion of foreign fishing fleets in general -- and the Japanese salmon fishing fleet in particular -- from within 200 miles of the coast. Furthermore, this latter act has led to the development of a strong Japanese market for a different, higher-priced product -- fresh-frozen as opposed to canned salmon. The 1979 Bristol Bay sockeye run was the best since 1970 -- over 30,000,000 of the 5-6 pound fish -- and the price offered the fisherman in 1979 was approximately four times that offered in 1970. These factors have led to greatly increased earnings for the Bristol Bay fisherman. LE holds forth the promise that the increased profit margin will not be dissipated among a host of new fishermen who would otherwise certainly enter the fishery at this time.

Many fishermen, particularly non-villagers, now find themselves heavily financially committed to the LE system because of the intrinsic value of the permits themselves. As a result of the improved outlook

for the Bristol Bay fishery (among others), a highly speculative market has developed for the permits. The going price for a drift net permit for Bristol Bay in 1979 was on the order of \$75,000. To many fishermen this represents a ready retirement fund in an industry with little other financial security -- especially to those fishermen who anticipate selling the permit upon leaving the fishery rather than passing it on in the family. Clearly, permit holders now have a great deal at stake in the system.

Given these advantages of the LE system, it is noteworthy that Bristol Bay residents are overwhelmingly opposed to it, although the system was ostensibly instituted in large part to enhance local fishing economies. In fact, however, LE significantly restricts the access of local people to the commercial fishing industry. There are several reasons for this.

For the native-Americans, who compose approximately two-thirds of the local population (Kresge *et al.* 1974), fishing is the economic base for their village way of life. It is therefore of primary concern that adult members of the community have access to the fishery. Families in Alaskan villages are typically large -- native-Americans in Alaska, and in Bristol Bay in particular, have one of the highest birth-rates in the United States (Kresge *et al.* 1974). In the past, young men served an apprenticeship under their father or other relative until they established themselves as adults in the community. They then obtained their own boat. However, without provision for new permits to be issued, there is no means by which young people can attain economic independence in the village under LE.

This problem is evident today among those in their early twenties, who were serving their apprenticeships as crewmen in the fishery at the time LE was enacted and who, therefore, did not qualify for licenses under the LE point system. Today they are raising their own families but are barred from fishing their own vessels and must scramble to serve as crew with friends and relatives. Clearly this problem will become more severe with time. If unalleviated, it must lead to the disintegration of village life through increased independence on a debilitating welfare system and outmigration.

It is significant that local persons are virtually unanimous in viewing the exclusion of the young as a major problem, but that other fishermen, even those raised in traditional fishing families, tend to be little concerned. In fact, it appears that non-local fishermen, including the ethnic Italian and Scandinavian fishermen, are on the whole not unhappy if their children leave fishing; indeed, many would prefer that their sons went to college and left fisheries. Also, non-local families are generally smaller, and the Bristol Bay fishery provides only supplementary income, so the problems of sharing a license are less acute. The LE system, by limiting the transmission of the fishery to future generations, thus threatens the economic base of the local way of life, but only serves to enhance the value of the fishery for most non-local fishermen.

The remoteness of the villages and the villagers' lack of familiarity with administrative procedures apparently also caused many Bristol Bay residents to fail to qualify for permits by missing application deadlines; failing to maintain adequate past records of

income and involvement in the fishery, which were required to document LE applications; or simply not understanding how best to complete the long, complex application. A substantial proportion of local residents who were interviewed, both formally and informally, had not been able to obtain a fishing permit despite a long-standing history of involvement in the fishery and dependence on it. While these cases could not be reviewed with the LE Commission, it is hard not to question the wisdom of this bureaucracy in its administration of the system. It was not an easy task to inform local villagers of the workings of such a complex system so they would have an equal opportunity to enter it -- but it is apparent that the Alaska LE Commission failed to do so adequately. It should be noted that 24% of native-Americans in Bristol Bay have had no formal education (Kresge *et al*, 1974).

It was at first surprising that many residents who had been long-time fishermen in fact failed to qualify for permits, particularly since the point-system adopted by the LE Commission gave special allowance for both rural applicants and those dependent upon fishing. However, the points for participation in the fishery were allocated so that the years immediately prior to the institution of the system were given the greatest weight. Some of these years were poor salmon years, as forecasted by the Department of Fish and Game. Non-local fishermen with alternative incomes could "afford" to fish on these poor years. But because local economies are in fact so dependent on summer earnings, some local residents turned to alternative employment during these years. For example, the residents of Nondalton have a

long-standing history of fishing the Bristol Bay run. However, on poor years they often turn to fire-fighting for the Bureau of Land Management. As a result, only a handful of households in Nondalton could qualify for even a single permit. Those local residents who were forced to turn to such short-term alternatives now find themselves unable to return to fishing.

Furthermore, a significant proportion of local residents who originally qualified have since sold their permits, largely as a result of the economic difficulties experienced during the long series of poor salmon years. The unrestricted saleability of the permits is a distinct feature of the Alaskan LE system. This creates a one-way flow of permits out of native-American hands, particularly now that the price of a LE permit has soared to over \$75,000 -- well out of reach of a villager.

While we were unable to quantify this, there appear to be a significant number of non-local, long-time fishermen who failed to qualify for LE permits under the Alaskan system. Bristol Bay gillnetters are traditionally fished by two men, who, in the past, were often friends or relatives and full partners. However, prior to the LE system, only one person on a vessel would purchase (and have in his name) the gear license. Possession of the license later became the sole criterion of full participation in the fishery as a captain, which generally proved necessary to obtain sufficient points to qualify for a permit. We encountered Bristol Bay fishermen whose fishing record goes back to the pre-1950 sailboat era, who now find themselves dependent on their fishing partner in order to remain in the fishery.

Other problems and complaints with the Alaskan LE system became apparent during the study. For one, the cost of the permits has led to some permits being bought by the very non-fishermen investors that the system was originally intended to exclude. However, our survey of cannery fishermen indicates this is not happening to the extent that it is commonly reported.

More seriously, the value of the fishery has led to various abuses of the system. Fishermen and residents commonly reported that there were more fishermen this past season than ever previously. This was commonly attributed to the widespread illegal duplication and counterfeiting of permits; to persons fishing and marketing their fish on another's permit or otherwise circumventing the system. Clearly such activity must be checked if the system is to remain viable. Our study was unable to determine the extent to which such activity was occurring. However, while much of it is no doubt simply criminal, we did find instances where local residents without viable alternatives and unable to obtain permits were engaged in illegal fishing. Clearly the LE system should be more strongly enforced only after the system's injustices have been removed. The local sentiment commonly expressed was: "We have only the fishing. What do they expect us to do?"

DISCUSSION

The Alaska LE system is having a significant impact on the fishermen and residents of Bristol Bay. Ironically, the policy is proving most deleterious to the marginal local fishing economies that

it was ostensibly implemented to aid. While the system is helping to maintain higher fishing incomes in an era of better runs and improved market conditions, the present system is clearly in need of reform.

The entry of young local people into the fishery presents the gravest problem with the current LE system. To facilitate this, the system should have incorporated an "apprenticeship period", after which crewmen can obtain their own permits; perhaps greater preference should be given to those living in rural areas who are most dependent on the fisheries. If points were allowed for fishing activity as crewmen since 1973, or as captains with interim permits, many local people would probably become eligible for permits. The LE Commission must also come to grips with its responsibility to the local fishing villages: the fact that villagers simply do not maintain consistent records of past activities does not justify their exclusion from the fishery. The freer use of interim, non-transferable permits would seem called for in many instances where economic need and dependence on the resource are apparent.

This summer's field work proved to be exceptionally timely. Upon returning, I learned that the Alaska legislature has undertaken a major review of its LE system. Considerable discontent with the present system has been expressed in numerous local hearings and the approximately 70 lawsuits concerning it (1978 Annual Report Commerical Fisheries Entry Comm.). I have arranged to bring my findings to the attention of the Alaska legislators -- Senator Hohman and Representative Nelson -- who represent the Bristol Bay area.

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INSTITUTE OF MARINE RESOURCES, A-018

LA JOLLA, CALIFORNIA 92093

October 14, 1979

Mr. David Gray
Representative Nelse Anderson
Pouch V
Juneau, Ak. 99811

Dear Mr. Gray:

I spoke with you on the phone some time ago about the field work I performed this summer in surveying the fishermen and residents of Bristol Bay concerning the impact of Limited Entry. I have enclosed a preliminary report that I wrote to the Center for Field Research, which helped support the project. In order to complete this work -- that is, in order to analyze the interview data statistically -- in the next few months, I will require some support. At this time, the project has no funding, and I am striving to complete my doctoral dissertation prior to assuming a position as assistant professor at Dalhousie University January 1. At this time, the interview data has been coded and is ready to be entered into the computer. However, I must bring in some help to complete this work for you before the end of the year. I wrote a request for funds to Mr. Chip Toma of Senator Hohman's office. Perhaps your office and his could support this work together. I believe that it will be of considerable value to you in your efforts to improve the situation in Bristol Bay. The value of my study should be apparent upon reading the enclosed preliminary report.

Sincerely,

Anthony Koslow
J. Anthony Koslow

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A Preliminary report on field work conducted
in Summer 1979

by

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questionnaire form was critically reviewed initially by Drs. D. Phillips and F. Bailey and was pre-tested, revised, and partially re-printed in Naknek. The interviews took approximately one hour to administer. Cooperation from the fishermen was generally excellent, although some of the local villagers found the questions difficult. However, this may be indicative of some of the very problems local residents encountered with the complex LE system itself.

I originally intended to limit the study to fishing captains (i.e. permit holders). However, I found during the initial ten-day period prior to the arrival of the volunteers that the most serious problems of the Alaskan LE system were found among old-time crew-members, who were not eligible to receive the permits, and the Bristol Bay residents, many of whom considered themselves, their families and communities deprived of full access to the resource. An ancillary questionnaire was therefore developed to be administered to all crew members on vessels chosen for the survey, who had fished in Bristol Bay for five years or longer. It was also found that the Bristol Bay residents formed a minority of the Bristol Bay fishing fleet. In order to represent their views adequately -- and also to determine the extent to which their claim of deprivation was justified -- another questionnaire was developed to be administered as a household survey. This latter survey was first conducted in Naknek and South Naknek, where it was based upon the Borough Tax Assessor's maps and property lists. At the end of the main sockeye run, when most fishermen returned to their homes, I administered this questionnaire in two

upriver villages as well -- Nondalton and Kokhanok. Funds for this latter work were provided by the Institute of Marine Resources. All village surveys were based on systematic samples -- censusing between one in two to one in five households -- based upon complete lists or maps of the area. At least ten households were surveyed in each of the four villages.

Just over 50 fishermen and over 50 local households were surveyed during the field season. The field samples were carefully drawn, so I am confident we interviewed a representative cross-section of the residents and legitimate fishermen. The different groups engaged in the fishery each appear to be remarkably homogeneous in their outlooks on the LE system. I hope this will permit me to generalize with some confidence about the different group characteristics, despite the relatively small sample size. However, I cannot determine this until the interviews are analyzed. The data from the interviews are now being computerized for statistical analysis. A number of less structured interviews and informal discussions were also conducted with representatives of the salmon industry and fishermen's marketing associations, as well as with numerous fishermen and residents on a casual basis. Field journals of these interviews and contacts were maintained by Ms. Gilliland and myself. The final report on the project will synthesize the quantitative and qualitative aspects of our study and should be complete before the end of the year.

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The fishing community can be divided into several groups clearly characterized by certain interests and views on LE. The non-local (i.e., non-Bristol Bay resident) fishermen overwhelmingly favor the LE system. This group includes the ethnic Italian fishermen, predominantly from California, Scandinavian-American fishermen from the Pacific Northwest, and fishermen from other parts of Alaska. Fishing is viewed by these fishermen as a business and LE serves predominantly to protect their financial position in the fishery in several ways.

On the other hand, fishing provides the economic base for the village way of life for many Bristol Bay residents -- predominantly native-Americans. Many local residents now find this way of life threatened by the LE system.

Non-local fishermen are committed to LE in large part as a result of a variety of conditions external to the LE system, which have greatly improved the biological and economic condition of the Bristol Bay salmon resource (and many other Alaskan fisheries as well). LE serves primarily to protect these gains. Climatic conditions have ameliorated in recent years leading to better runs following the worst runs of the century earlier in the decade. Competition for the resource has been reduced following the exclusion of foreign fishing fleets in general -- and the Japanese salmon fishing fleet in particular -- from within 200 miles of the coast. Furthermore, this latter act has led to the development of a strong Japanese market for a different, higher-priced product -- fresh-frozen as opposed to canned salmon. The 1979 Bristol Bay sockeye run was the best since 1970 -- over 30,000,000 of the 5-6 pound fish -- and the price offered the fisherman in 1979 was approximately four times that offered in 1970. These factors have led to greatly increased earnings for the Bristol Bay fisherman. LE holds forth the promise that the increased profit margin will not be dissipated among a host of new fishermen who would otherwise certainly enter the fishery at this time.

Many fishermen, particularly non-villagers, now find themselves heavily financially committed to the LE system because of the intrinsic value of the permits themselves. As a result of the improved outlook

for the Bristol Bay fishery (among others), a highly speculative market has developed for the permits. The going price for a drift net permit for Bristol Bay in 1979 was on the order of \$75,000. To many fishermen this represents a ready retirement fund in an industry with little other financial security -- especially to those fishermen who anticipate selling the permit upon leaving the fishery rather than passing it on in the family. Clearly, permit holders now have a great deal at stake in the system.

Given these advantages of the LE system, it is noteworthy that Bristol Bay residents are overwhelmingly opposed to it, although the system was ostensibly instituted in large part to enhance local fishing economies. In fact, however, LE significantly restricts the access of local people to the commercial fishing industry. There are several reasons for this.

For the native-Americans, who compose approximately two-thirds of the local population (Kresge *et al.* 1974), fishing is the economic base for their village way of life. It is therefore of primary concern that adult members of the community have access to the fishery. Families in Alaskan villages are typically large -- native-Americans in Alaska, and in Bristol Bay in particular, have one of the highest birth-rates in the United States (Kresge *et al.* 1974). In the past, young men served an apprenticeship under their father or other relative until they established themselves as adults in the community. They then obtained their own boat. However, without provision for new permits to be issued, there is no means by which young people can attain economic independence in the village under LE.

This problem is evident today among those in their early twenties, who were serving their apprenticeships as crewmen in the fishery at the time LE was enacted and who, therefore, did not qualify for licenses under the LE point system. Today they are raising their own families but are barred from fishing their own vessels and must scramble to serve as crew with friends and relatives. Clearly this problem will become more severe with time. If unalleviated, it must lead to the disintegration of village life through increased independence on a debilitating welfare system and outmigration.

It is significant that local persons are virtually unanimous in viewing the exclusion of the young as a major problem, but that other fishermen, even those raised in traditional fishing families, tend to be little concerned. In fact, it appears that non-local fishermen, including the ethnic Italian and Scandinavian fishermen, are on the whole not unhappy if their children leave fishing; indeed, many would prefer that their sons went to college and left fisheries. Also, non-local families are generally smaller, and the Bristol Bay fishery provides only supplementary income, so the problems of sharing a license are less acute. The LE system, by limiting the transmission of the fishery to future generations, thus threatens the economic base of the local way of life, but only serves to enhance the value of the fishery for most non-local fishermen.

The remoteness of the villages and the villagers' lack of familiarity with administrative procedures apparently also caused many Bristol Bay residents to fail to qualify for permits by missing application deadlines; failing to maintain adequate past records of

income and involvement in the fishery, which were required to document LE applications; or simply not understanding how best to complete the long, complex application. A substantial proportion of local residents who were interviewed, both formally and informally, had not been able to obtain a fishing permit despite a long-standing history of involvement in the fishery and dependence on it. While these cases could not be reviewed with the LE Commission, it is hard not to question the wisdom of this bureaucracy in its administration of the system. It was not an easy task to inform local villagers of the workings of such a complex system so they would have an equal opportunity to enter it -- but it is apparent that the Alaska LE Commission failed to do so adequately. It should be noted that 24% of native-Americans in Bristol Bay have had no formal education (Kresge *et al*, 1974).

It was at first surprising that many residents who had been long-time fishermen in fact failed to qualify for permits, particularly since the point-system adopted by the LE Commission gave special allowance for both rural applicants and those dependent upon fishing. However, the points for participation in the fishery were allocated so that the years immediately prior to the institution of the system were given the greatest weight. Some of these years were poor salmon years, as forecasted by the Department of Fish and Game. Non-local fishermen with alternative incomes could "afford" to fish on these poor years. But because local economies are in fact so dependent on summer earnings, some local residents turned to alternative employment during these years. For example, the residents of Nondalton have a

long-standing history of fishing the Bristol Bay run. However, on poor years they often turn to fire-fighting for the Bureau of Land Management. As a result, only a handful of households in Nondalton could qualify for even a single permit. Those local residents who were forced to turn to such short-term alternatives now find themselves unable to return to fishing.

Furthermore, a significant proportion of local residents who originally qualified have since sold their permits, largely as a result of the economic difficulties experienced during the long series of poor salmon years. The unrestricted saleability of the permits is a distinct feature of the Alaskan LE system. This creates a one-way flow of permits out of native-American hands, particularly now that the price of a LE permit has soared to over \$75,000 -- well out of reach of a villager.

While we were unable to quantify this, there appear to be a significant number of non-local, long-time fishermen who failed to qualify for LE permits under the Alaskan system. Bristol Bay gillnetters are traditionally fished by two men, who, in the past, were often friends or relatives and full partners. However, prior to the LE system, only one person on a vessel would purchase (and have in his name) the gear license. Possession of the license later became the sole criterion of full participation in the fishery as a captain, which generally proved necessary to obtain sufficient points to qualify for a permit. We encountered Bristol Bay fishermen whose fishing record goes back to the pre-1950 sailboat era, who now find themselves dependent on their fishing partner in order to remain in the fishery.

Other problems and complaints with the Alaskan LE system became apparent during the study. For one, the cost of the permits has led to some permits being bought by the very non-fishermen investors that the system was originally intended to exclude. However, our survey of cannery fishermen indicates this is not happening to the extent that it is commonly reported.

More seriously, the value of the fishery has led to various abuses of the system. Fishermen and residents commonly reported that there were more fishermen this past season than ever previously. This was commonly attributed to the widespread illegal duplication and counterfeiting of permits; to persons fishing and marketing their fish on another's permit or otherwise circumventing the system. Clearly such activity must be checked if the system is to remain viable. Our study was unable to determine the extent to which such activity was occurring. However, while much of it is no doubt simply criminal, we did find instances where local residents without viable alternatives and unable to obtain permits were engaged in illegal fishing. Clearly the LE system should be more strongly enforced only after the system's injustices have been removed. The local sentiment commonly expressed was: "We have only the fishing. What do they expect us to do?"

DISCUSSION

The Alaska LE system is having a significant impact on the fishermen and residents of Bristol Bay. Ironically, the policy is proving most deleterious to the marginal local fishing economies that

it was ostensibly implemented to aid. While the system is helping to maintain higher fishing incomes in an era of better runs and improved market conditions, the present system is clearly in need of reform.

The entry of young local people into the fishery presents the gravest problem with the current LE system. To facilitate this, the system should have incorporated an "apprenticeship period", after which crewmen can obtain their own permits; perhaps greater preference should be given to those living in rural areas who are most dependent on the fisheries. If points were allowed for fishing activity as crewmen since 1973, or as captains with interim permits, many local people would probably become eligible for permits. The LE Commission must also come to grips with its responsibility to the local fishing villages: the fact that villagers simply do not maintain consistent records of past activities does not justify their exclusion from the fishery. The freer use of interim, non-transferable permits would seem called for in many instances where economic need and dependence on the resource are apparent.

This summer's field work proved to be exceptionally timely. Upon returning, I learned that the Alaska legislature has undertaken a major review of its LE system. Considerable discontent with the present system has been expressed in numerous local hearings and the approximately 70 lawsuits concerning it (1978 Annual Report; Commerical Fisheries Entry Comm.). I have arranged to bring my findings to the attention of the Alaska legislators -- Senator Hohman and Representative Nelson -- who represent the Bristol Bay area.

They are actively involved in the review of the LE system and are considering drafting the legislation required to reform the system.

I will also have several opportunities to present this work before fisheries conferences and I intend to submit the completed work to a professional journal related to fisheries or marine management. I will certainly forward you copies of this work. A grant proposal has been submitted to the National Science Foundation to continue work along these lines. At the end of the volunteers' field period, we were fortunate to be visited by Mr. Larry Rosenberg, Program Manager of the appropriate section of the NSF, who showed considerable interest in the project.

It is certainly my hope that we come to understand better the social systems of the dominant groups involved in American fisheries today, particularly in relation to the major changes many fisheries are presently experiencing. This season's project clearly shows the consequences of effecting sweeping structural changes in a fishery without sufficient awareness of their possible consequences. Once again, I thank you for providing me the opportunity to launch an important research project, which I believe will have considerable significance to the fishermen of Alaska and elsewhere.

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A Sociological Study of Limited Entry in the
Bristol Bay Salmon Fishery:
A Preliminary report on field work conducted
in Summer 1979

by

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(This is a preliminary report -- not to be quoted or cited without
permission of the author)

villages, Naknek and South Naknek, for their market, services and, most important, their housing, which greatly facilitates sampling the fishing population. LE has been in effect in Bristol Bay since 1974, giving sufficient time for its impact to emerge. Bristol Bay seemed particularly apt for a study of this question since Crutchfield and Pontecorvo (1969) used this salmon fishery as their prime example of a fishery particularly in need of LE. I am also personally familiar with the fishery, having fished the Bristol Bay sockeye run myself for two seasons (1970-71).

The Center for Field Research seemed ideally suited to enable me to undertake this project. The Bristol Bay sockeye run is not only the world's largest -- it is also one of the most intense, taking place in less than a month's time. I therefore required additional personnel if I was to interview a sufficient number of fishermen during the brief fishing season. Also, while I was able to enlist additional support from the Institute of Marine Resources, University of California, San Diego, most traditional funding agencies were wary of supporting a marine ecologist undertaking his first project in the social sciences. It should be noted, however, that this work has received continued support and encouragement from Drs. David Phillips and Frederick Bailey, members of the Social Science faculties of the University of California, San Diego, and Prof. John Isaacs, Director of the Institute of Marine Resources. Through the Center for Field Research, an EARTHWATCH team of six volunteers was formed, who funded and helped perform the greater part of the work during the 1979 field season in Bristol Bay.

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Fisheries in western countries have traditionally been open to all who obtained the necessary license and gear. In recent decades resource economists have argued that this arrangement leads to economic inefficiency -- namely, that the harvest of open-access resources tends toward an equilibrium where no profit is realized, since so long as there is a profit to be made, additional persons will enter to exploit the resource (Gordon 1955, Crutchfield and Pontecorvo 1969). Impressed by this argument, fishery managers have placed a number of fisheries under a radically different regulatory regime known as "limited entry" (LE). Under LE management, the number of fishermen harvesting a particular resource is limited, usually to the present license-holders. However, the broader socioeconomic impact of this change in the structure of fisheries has not yet been examined. In particular, questions arise as to how LE policies will affect the transmission of fisheries to succeeding generations, particularly in traditional fishing communities, as well as to the general relationship between such policies and traditional fishing strategies and life-styles.

I proposed a survey of the Bristol Bay salmon fishermen in order to examine some of the social, economic, and cultural implications of LE. This fishery was particularly appropriate for study for several reasons. Several of the major fishery groups in America are well represented there; both full- and part-time fishermen, ethnic Italian, Scandinavian, and native-American fishermen, as well as many non-ethnic fishermen. Because of its isolation, the fishermen in Bristol Bay are dependent upon a relatively few canneries located in two fishing

Ten days prior to the arrival of the volunteers, I flew to Naknek with my logistical coordinator for the summer, Mary Kay Gilliland, a first-year graduate student in anthropology at the University of California, San Diego, in order to lay the groundwork for the summer's field work. I had earlier written the various canners there about the possibilities of obtaining housing with them and of enlisting their cooperation with my research, but my queries had all gone unanswered. Mary and I therefore had to obtain housing and establish working relationships with the canners and fishermen, as well as to pre-test and revise the questionnaire.

I obtained complete lists of the fishermen under contract with six of the eight major canners in the Naknek area. These lists were divided into those fishermen with original permits and those whose permits were obtained later, primarily through sale or transfer. Stratified random samples were then based upon these lists. Fishermen were interviewed at five of the canneries -- the list from the sixth cannery was obtained too late in the season to be of real value. However, the same ethnic and demographic groups of fishermen were generally found at the different canneries.

The interviews with the fishermen were based upon a standard questionnaire with both open- and close-ended questions that covered the respondent's basic demographic characteristics; the characteristics of the vessel and gear he used in Bristol Bay; his own and his family's involvement in fisheries, particularly in Bristol Bay; the impact of LE on his household's fishing income and fishing strategy; and his views on LE and its impact on various groups of participants. The

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Look
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