OCS Study MMS 2004-038

Final Report

A Study of the Drift Gillnet Fishery and Oil/Gas Industry Interactions and Mitigation Possibilities in Cook Inlet

Prepared for

U.S. Department of the Interior
Minerals Management Service, Alaska OCS Region

by

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1.0 Introduction

Cook Inlet in Southcentral Alaska is rich in oil and natural gas and marine fisheries resources. Offshore oil and gas production has been occurring in close proximity to fishing operations in the state waters of central and upper Cook Inlet since the mid-1970s. The geologic potential of submerged lands on the federally-administered Outer Continental Shelf (OCS) further to the south may eventually be explored and developed by the oil and gas industry. Research is being conducted to examine the feasibility, costs and benefits, and potential effects of such efforts. Portions of the Cook Inlet OCS are important fishing grounds, and research has been undertaken to examine potential interactions between fisheries and oil and gas activities in the region.

Oil and gas industry activity on the OCS is administered by the U.S. Department of the Interior, Minerals Management Service (MMS). MMS has prepared an Environmental Impact Statement (EIS) assessing the potential effects that oil industry activities on the Cook Inlet OCS could have on the region's human and physical environments. The EIS was conducted in advance of Lease Sales 191 and 199. The northerly portion of the lease sale area coincides with the southern range of the salmon drift gillnet fleet.[1] Scoping efforts associated with the EIS revealed that some participants in the fishery were concerned that prospective oil and gas industry activities on the OCS might affect their at-sea operations.

Some drift captains have reported that drilling platforms in the state jurisdiction waters of Cook Inlet have in the past presented navigational hazards to their operations. There are currently 15 platforms in Upper Cook Inlet, 12 of which remain operational. These are largely outside (north) of the most popular contemporary drift gillnet grounds. There are no platforms in the federal jurisdiction waters of Cook Inlet.

This report describes the process and results of research conducted for MMS to examine historic and potential future interactions between the drift gillnet fishery and the offshore oil and gas industry operating in Cook Inlet. Its focus is on objective definition and assessment of specific means for mitigating spatial conflicts between the fishery and the oil and gas industry if offshore platform-based exploration and development were to occur on the OCS in future years.

Project findings are based on a period of intense research conducted during and soon after the summer 2003 drift season, and into the spring months of 2004. The research and report have been completed under MMS Contract 1435-01-03-CT-71847 by Impact Assessment, Inc. (IAI), a firm specializing in maritime social science research.

In fulfillment of contract requirements, IAI has rigorously sought and identified options that could prove useful in mitigating spatial conflicts associated with the fisheries-oil and gas interface on the Cook Inlet OCS. These options and the associated description and analyses are intended as useful resources for MMS analysts and others with relevant responsibilities and

[1] Drift gillnets are also used to harvest herring in Cook Inlet. This study focuses on the more popular and productive salmon drift gillnet fishery.

interests in the region. We note at the outset, however, that our findings do not imply or in any manner obligate any local, state, or federal agency (including MMS) or other public or private institution to pursue or implement any action described or recommended.

1.1 Policy and Administrative Background

MMS is responsible for administering oil and gas development on the OCS under stipulations in the Outer Continental Shelf Lands Act of 1953[2] (OCSLA). An important provision of OCSLA authorizes MMS to conduct and sponsor studies of coastal and marine environments potentially affected by oil and gas industry activities occurring on the OCS.

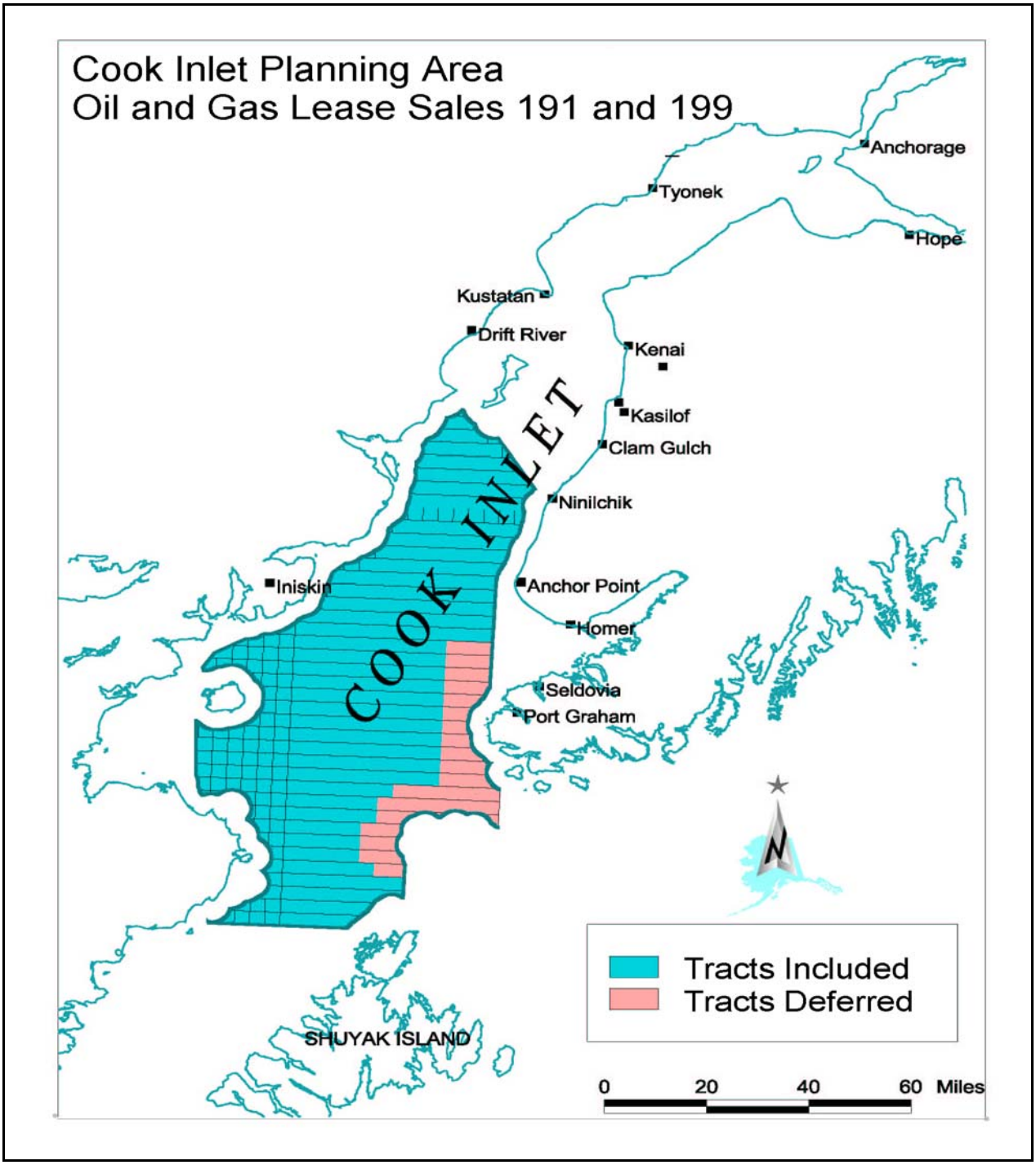
NEPA (the National Environmental Policy Act of 1969) calls for use of natural and social science to contribute to decisions associated with major environmental policy around the United States. As such, federal agencies including MMS acquire, analyze, and use environmental, economic, and social information pertinent to decisions associated with resources on the OCS.

MMS Offshore Program-Alaska Region oversees oil and gas activities on the OCS throughout Alaska, including the Cook Inlet OCS (see Map 1-1 below). As part of its functions under OCSLA and NEPA, the agency's Environmental Studies Section (ESS) administers the Alaska Environmental Studies Program. Its purpose is to "define information needs and implement studies to assist in predicting, projecting, assessing, and managing potential effects on the human, marine, and coastal environments of the OCS and coastal areas that may be affected by gas and oil development" (MMS 2002c:1). Information from MMS studies is used for various decision-making and planning purposes, including use in agency Environmental Assessment (EA) and EIS documentation.

1.2 The Research Problem and Purpose of the Study

This report provides focused description of the drift gillnet fishery and its historic and potential future interactions with the offshore oil and gas industry in Cook Inlet. The question of whether spatial interactions between the industries have or may present significant problems for the drift gillnet fleet is treated as the primary area of inquiry for the research. Analysis of findings under this frame of inquiry is necessary for defining and assessing options for mitigating potential interface problems on the OCS. As described in this and later subsections, both industries have long and productive histories in the region.

[2] As amended through P.L. 105-580, December 29, 2000



Map 1-1 Lease Sale Areas 191 and 199 in the Cook Inlet Planning Area

1.2.1 Coexistence as Context

Fishing and extraction of oil and gas resources occur in close proximity in various parts of Alaska. This is certainly the case in Cook Inlet where communities have developed in association with involvement in both forms of enterprise. Cook Inlet is a geologic basin characterized by varied and extensive oil and gas reserves, and a large embayment encompassing some 8,000 square-miles of tidal water and extensive marine fisheries resources.

The drainage area associated with Cook Inlet includes approximately 39,000 square-miles of Southcentral Alaska (Cook Inlet Keeper 2003). Large runs of salmon move in from the ocean to return to their native streams in this region each summer, typically ending the migration by late August. Silver salmon (*Oncorhynchus kisutch),* also known as Coho salmon, continue spawning in the Kenai River well into October.

The region's first salmon cannery was opened at Kasilof in 1882 (Sherwood 1974:105), and the Alaska Petroleum Company initiated drilled in Oil Bay in 1901 (Moffitt 1974:133-137). Discovery of the gas-rich Swanson Field occurred in the mid-1950s at about the same time drift gillnet fishing methods were introduced in the region.

Drift gillnet fishing involves the laying out of long gill nets in targeted areas and at calculated times to harvest Sockeye salmon, also known as Red salmon (*Oncorhynchus nerka*), and other salmon species. Reds are the primary target given a relatively high market value. King or Chinook salmon (*Oncorhynchus tshawytscha*) are also valuable, though the species generally constitutes only about 2.5 percent of Upper Cook Inlet ex-vessel salmon value (Alaska Department of Fish and Game 2003a). Each of the salmon species are taken incidentally (and on occasion by design) by drift gillnet methods, depending on the timing and location of coincidental runs, and the market value of the moment.

Drift gillnet vessels are typically between 28 and 44 feet in length. Many experienced captains set their nets in rip tide zones where salmon are said to congregate. Others opt for less turbulent areas. Rip tides are areas of unusual current movement, often characterized by unique patterns of surface flow and flotsam (readers are referred to LGL Alaska Research Associates (2000) for detailed analysis of rip tides in Cook Inlet). The vessel drifts in the vicinity of the net prior to retrieval. A more detailed description of the operation is provided in Section 3.0 of this report.

Fishing in Cook Inlet is unique insofar as participants encounter some of the most challenging current conditions of any Alaska fishery. Currents can sometimes reach seven and eight knots, and wind waves are characteristically steep. Water depth in the fishing zone is typically in the range of 25 to 50 fathoms. Local weather is affected by orthographic flow associated with terminal end of the high and glaciated Alaska Range on the western shoreline of the Inlet. Four active volcanic peaks are visible. Smoke and steam are often seen above Mt. Redoubt, which towers 10,198 feet above Cook Inlet.

There are numerous adjacent fisheries. Among the important fleets and fisheries with which participants in the drift gillnet fishery interact (and in some cases participate) are: (1) the purse seine and set net salmon fisheries[3]; (2) the halibut sport, charter, and commercial fisheries; (3) the herring fisheries; (4) various subsistence fisheries; and (5) the salmon sport and charter fisheries (see Hermann et al. 2001 for description of the latter).

The operating range and efficiency of the drift fleet increased dramatically during the late 1960s and into the 1970s in proportion with improving efficiency of vessels, engines, and gear. This occurred during the same era when offshore drilling activity was initiated in earnest in Cook Inlet. The first offshore oil platform was developed in Cook Inlet in 1964, the same year as a large discovery near the McArthur River (Kenai Peninsula Borough 2003). Industry activity was extensive during the 1960s and 1970s, with 15 offshore facilities moving into production mode in Upper Cook Inlet during the period (State Of Alaska 1999a:6-14).

By the mid-1970s, offshore production was occurring in close proximity to vessels pursuing pink or humpback salmon (*Oncorhynchus gorbuscha*), and chum or dog salmon (*Onchorynchus keta*) in the more northerly reaches of the Inlet.[4] The 1980s were boom years for oil development and fisheries production and value in the region, and reportedly it was not uncommon for Kenai Peninsula oil industry workers to take time off from their jobs to participate in the drift gillnet fishery.

1.2.2 Trends of Diminishing Production

Salmon production in Cook Inlet is extensive, though it has varied over time. Total salmon harvest in 1975, the first year documented by Alaska Department of Fish and Game (ADF&G), was 9.5 million pounds, with fleet-wide gross earnings totaling $4.5 million. Production peaked in 1992 at 45.3 million pounds, with fleet earnings totaling $66.4 million. There were 580 active permits that year. Decline in productivity since the peak was precipitous and lasted through the 1990s, averaging 12.2 million pounds between 1994 and 2001, across an average of 539 active permits. Production in 2002 was 12.6 million pounds, with fleet-wide gross earnings totaling $5.7 million across only 409 permits.

Market conditions underlie a significant decline in drift gillnet activity in recent years. Many Cook Inlet operators have chosen not to fish their permits, opting to wait until prices improve. Part of the problem relates to saturation of the domestic seafood market with pen-reared salmon from domestic and foreign sources. Some pen-reared salmon was recently found to contain relatively high levels of dioxin (Hites et al. 2004:226-229; Stokstad 2004:154-155). Public

[3] There were 743 active/viable Cook Inlet set net permits in 2002 (Alaska Commercial Fisheries Entry Commission 2003). Many participants in this fishery are members of the Kenai Peninsula Fishermen's Association. As of February 2003, the official position of the Association on Lease Sales 191 and 1999 was "cautious concern" (Kenai Peninsula Fishermen's Association 2003).

[4] Participants report that formerly favorable prices for pink salmon and the migration patterns of pinks historically lead some vessels to work in areas near the existing platforms. There reportedly is now little market incentive to fish in those areas and hence little interaction between the vessels and industry infrastructure.

concerns about farmed salmon may actually benefit Alaska market conditions, if marketing strategies can capitalize on the attractive attributes of salmon caught in the state. Some drift gillnet participants in the region look to the apparent success of "Copper River wild" as a model for marketing Cook Inlet salmon.

As noted in Table 1-1 below, participation in the drift gillnet fishery occurs at varying levels of involvement across the Kenai Peninsula and other communities. Of note in the table, many of the communities along the Peninsula are experiencing some measure of population growth. Total population in Kenai Borough in 2000 was 49,691 persons, or roughly about eight percent of the year 2000 statewide population of 626,932 persons.

Table 1-1 Population Trends and Year 2000 Permits and Landings: Kenai Borough Communities

Community or CDP	1990 Pop./ 2000 Pop.	Households/ Permit Holders	% Drift Gillnet Households	Permits Fished	Total lbs. Landed	Est. Gross Earnings $
Kenai	6,327/6,942	2,622/66	2.5	61	768,418	521,666
Sterling CDP	3,802/4,705	1,676/5	.2	5	74,565	49,527
Nikiski CDP	2,743/4,327	1,514/17	1.1	*	*	*
Homer	3,660/3,946	1,599/102	6.3	92	1,245,730	842,620
Soldotna	3,482/3,759	1,465/55	3.7	53	635,643	438,598
Anchor Point CDP	866/1,845**	711/15	2.1	15	212,644	147,124
Ninilchik	485/757	320/11	3.4	9	122,697	81,733
Kasilof	316/477	180/32	17.0	30	380,014	266,164
Nikolaevsk CDP	371/345	96/5	5.2	4	54,787	36,922
Clam Gulch	62/186	67/3	4.4	3	†	†

Source: State of Alaska, Department of Fish & Game, ACFEC, and U.S. Census Bureau 2000;
*Data included with the City of Kenai; ** Growth is related in part to allocation of $22 million to construct the North Pacific Volcano Learning Center near Anchor Point; † Reporting would violate the "rule of three."

With regard to interest in the Cook Inlet region oil and gas resources, over 40 lease sales have been held in the region by the State of Alaska since a 77,000 acre area in Upper Cook Inlet was leased during the first bidding in 1959. The most recent sale in May 2004 resulted in successful sale of 72 tracts sold, a significant increase over the 27 tracts sold in 2003. Cook Inlet OCS lease sales have been held in 1977, 1981, 1982, and 1997, though again, there has never been production on the OCS in this region. No companies expressed immediate interest in OCS Lease Sale 191 tracts in May 2004, leading to its cancellation. Lease Sale 199 is scheduled for 2006.

As of 2002 - the most current year for which total production had been calculated at the time of this writing - the Kenai Peninsula and offshore fields had produced since initial days of production some 1.293 billion barrels (bbl) of crude and 6.421 trillion cubic feet (cf) of natural gas. The year 2002 production level in the Cook Inlet basin was 11.284 mbbl of oil and 209 bcf of natural gas. Natural gas is exported for as liquid natural gas and fertilizer, and used to produce electricity and heat throughout the region, including Anchorage. As noted in Figures 1-1 and 1-2 below, oil production levels peaked in the 1970s, but gas production has only just peaked, with indication of a impending steep decline (Alaska Division of Oil and Gas 2003).

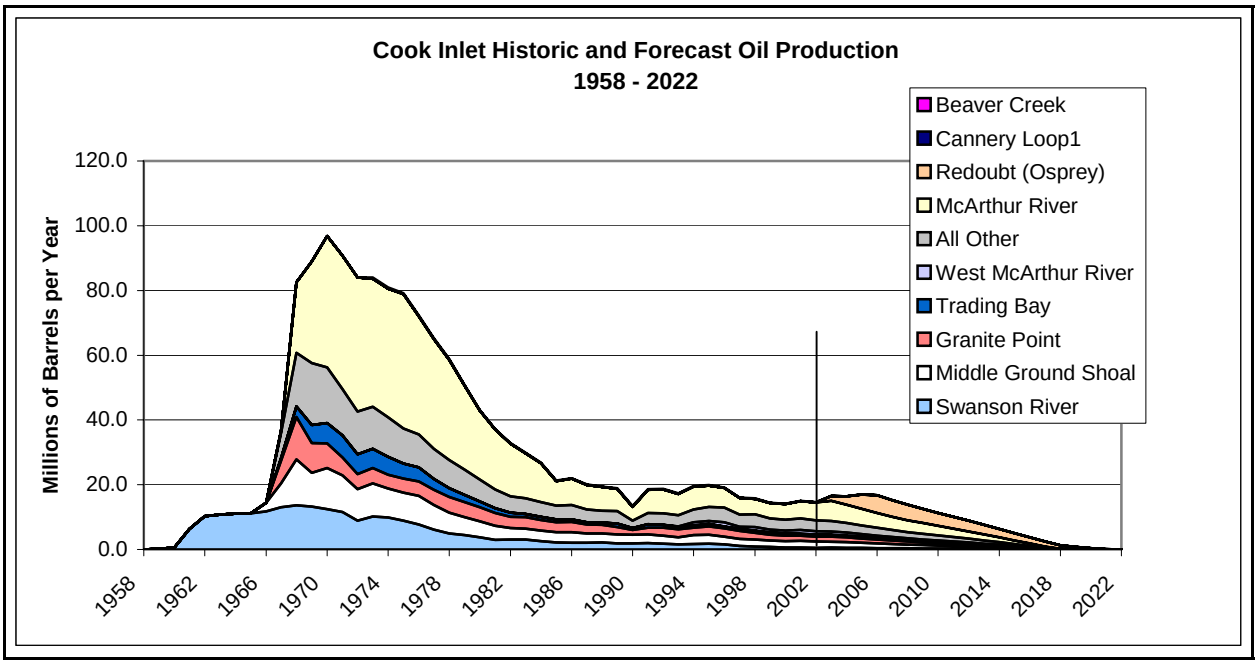


Figure 1-1 Oil Production Trend Line for Cook Inlet Region (from Alaska Division of Oil and Gas)

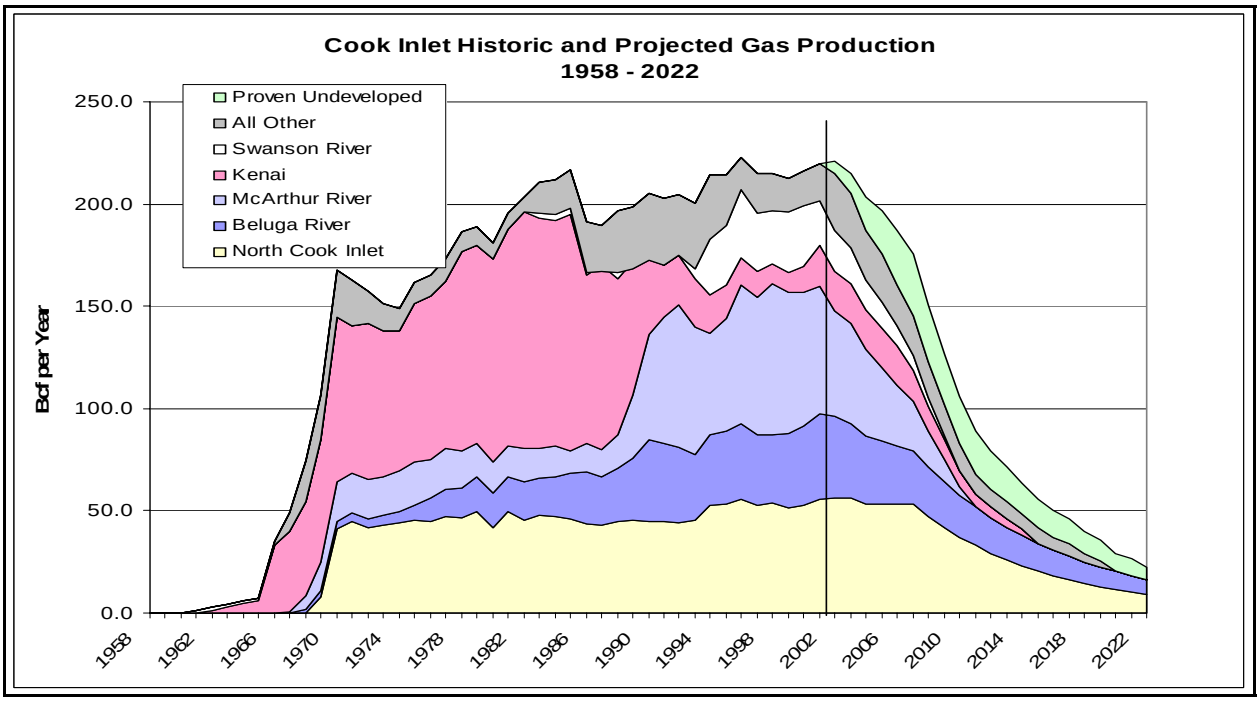


Figure 1-2 Gas Production Trend Line (from Alaska Division of Oil and Gas)

The trend of diminishing oil and gas resource development in Cook Inlet (State of Alaska Division of Oil and Gas 1999:6-20) is reflected in the regional employment figures depicted in Table 1-2. While numbers of persons working in the extraction sector have increased, increasingly fewer persons are employed in manufacturing.

Table 1-2 Oil and Gas Employment, Persons by Sector, Kenai Peninsula Borough

Sector	1990	1995	2000
Oil and Gas Extraction	1,175	1,104	1,622
Oil and Gas Manufacturing	444	482	408
Chemicals and Allied Products	N/A	N/A	N/A
Petrolem and Coal Products	N/A	N/A	N/A
TOTAL	1,619	1,586	2,030

Source: State of Alaska, Department of Labor and Workforce Development

Moreover, oil and gas industry employment has declined in recent years relative to other forms of employment in the region. Kenai Borough employment figures for 1980 indicate employment in the industry reached 16 percent, but by the end of the 1990s the figure had dropped to 8.9 percent.

The fishing and oil and gas industries have and been and remain important throughout the Kenai Peninsula. But both appear to be waning in terms of production and economic return. Diminishing production has led residents to report concern about the future economic well-being of their families and communities, though many such concerns also relate to national economic trends and challenges experienced at the local level.

1.2.3 Interactions and Challenges

Geologists are optimistic that northeasterly portions of the Cook Inlet OCS (southwest of Ninilchik) could yield significant volumes of oil and natural gas. Many Kenai Peninsula residents recognize the benefits of offshore exploration and development, while others voice concern about potential environmental problems.

There *have* been incidents of discord between the fishing and oil and gas industries and their participants and representatives in the region. This was the situation following the grounding and spillage of crude oil by the *Glacier Bay* in Cook Inlet 1987, and the *Exxon Valdez* in Prince William Sound in 1989. In the former case, the drift gillnet fishery was disrupted by the local presence of oil at the height of a particularly productive season and when market prices for salmon were particularly high. The fishery was closed entirely during the 1989 season due to fears of tainting from the *Exxon Valdez* accident. The protracted nature of litigation associated with the *Exxon Valdez* spill has led to dissatisfaction among fishers[5] involved in the situation.

The United Cook Inlet Drift Association (UCIDA) formally represents drift gillnet fishery participants in the region. Its leadership has officially alternated in recent years between opposition to and support of oil and gas industry activity in Cook Inlet. Opposition was particularly strong after the oil spills, but has shifted in recent years to guarded support based on concerns about the regional importance of the oil industry. Concern about the probabilities of a

[5] There are relatively very few women active in the Cook Inlet drift gillnet fishery. While we use the gender-neutral phrases “fishery participants,” or “drift gillnetters” throughout most of this report, the term “fishermen” is most accurate in terms of rate of participation by gender, and is also used.

significant spill resulting from activities on the Cook Inlet OCS appear to underlie the beginnings of a shift in official stance back toward politically cautious opposition to offshore drilling and related activities.

The stated concerns of drift gillnet fishery participants are highly focused on three potentialities: (1) fishing and navigation would be physically compromised by placement of an oil platform in the fishing grounds; and (2) an oil spill in the region would potentially damage the resource, and disrupt fishing and market conditions, and (3) increased vessel traffic due to offshore activity could affect fishing and navigation, and reduce the total allowable fishing area.

1.2.4 Areas of Inquiry

Given the stated concerns of drift gillnet fishery participants, and the interest of MMS in mitigating problems on the OCS, the agency has sponsored this study to more fully examine the issues, to identify viable mitigation options, and to assess the issues and options given the social, economic, and ecological context of the region. IAI's approach to the research has thus been designed to address two basic areas of inquiry.

First, we seek to fully understand and describe the drift gillnet-oil industry interface in Cook Inlet. The intent of the sponsored research to investigate mitigation strategies logically pre-supposes that oil and gas industry activities on the OCS *would* indeed disrupt the drift fleet. Claims and concerns of this nature have been asserted by drift gillnetters in the region for some years. Our research treats the assertion as a working hypothesis, and uses various research methods to "ground-truth" the claims. In short, we seek to answer whether establishment of platform drilling and associated activities (for example, movement of support vessels, acoustic testing, transport, release of contaminants) on the OCS could actually cause problems for drift gillnetters. As part of this effort, we examine the historical interface between the fleet and oil and gas operations in the state jurisdiction waters of Cook Inlet.

If the study shows that there is potential for problems, the research moves on to explore and define specific ways to mitigate them. In order to do this, we systematically identify a sample of seasoned drift fishery participants with whom to discuss individually and in group settings (a) the range of problem interactions that could occur between the fleet and oil and gas industry on the OCS, and (b) feasible means for reducing or solving those problems.

The mitigation analysis draws heavily on our literature search of offshore interface problems and solutions developed in various other places around the world (Appendix A). Of particular note in this review is the work of Cormick and Knaster (1986), Fusaro (1991), and Knaster *et al*. (1998), who describe a *Fisheries/Oil Committee and Liaison Office* that addresses the concerns of fishery participants and oil and gas industry firms active on and around the California OCS west of Santa Barbara County and Ventura County. The work of the *Faroe Islands Hydrocarbon Planning Commission* (1997) is also relevant. Like the newly commissioned Canadian group called *Ocean One*, it advocates the participation of fishing and oil and gas industry representatives in various think-tank and decision-making processes. Finally, the research and analysis provided in the MMS Final EIS for Lease Sales 191 and 199 (MMS 2003a,b,c), and in

the Final Findings of the Director for the Cook Inlet Areawide Oil and Gas Lease Sale (State of Alaska Division of Oil and Gas 1999) are topically and geographically highly relevant to the current project.

1.3 Project Objectives and Research Methods Employed

A series of interrelated objectives were formulated by MMS ESS to gather the range of information needed to satisfy the primary goals of the project. IAI subsequently designed a research plan and used various social science research methods to meet those objectives and to collect and analyze the various data needed to address the research questions outlined above.[6] The project objectives, rationale, and corresponding research methods used during the course of the project[7] are depicted in Table 1-1 below:

Table 1-3 Project Objectives and Associated Research Methods

Objective	Purpose	Method/Approach
Conduct Full Literature Search	Investigate how similar conflicts have been handled around world	Collect/analyze all relevant data from extant secondary sources
Synthesize Relevant Secondary Source and Archival Information	Integrate existing information about: conflict mitigation; social, economic, and demographic conditions in the region; and regional drift gillnet and oil/gas operations	Synthesize into single database searchable by topic, location environmental factor, group or other relevant characteristic
Collect Data on Drift Gillnet Operations, Preferred Fishing Locations, and Salmon Migration Patterns	Identify areas of competing use and basic operational aspects of the drift fleet including issues of navigation, safety, fishing strategies.	Use social network sampling approach to identify seasoned drift fishery participants for purpose of interviewing
Construct a Geographic Information System (GIS)	Depict/analyze spatial elements of historic, current, and future interactions between drift gillnet fleet and oil/gas industry	Use existing baseline and new data collected through interviews and mapping exercises with key informants
Conduct Ethnographic Work on Drift Gillnet Vessels	Develop insight into contemporary drift gillnet operations and potential interaction with oil/gas industry vessels and/or infrastructure	Observe/interview key informants on their vessels and record behaviors and strategies of drift operators and operations
Conduct Ethnographic Work on the Oil Platforms	Develop insight into contemporary oil platform operations and potential interaction with drift gillnet vessels	Observe/interview platform operators, record relevant information about operations
Meet and Consult with Fishery Participants and Groups	Refine information about drift operations and mitigation issues; provide opportunity for commentary on preliminary research findings	Hold meetings with seasoned drift gillnet operators in the study region.

[6] The project research design is described in the deliverable titled "Guide to Field Activities: Driftnet Fishery Research," submitted early in the period of contract performance.

[7] Preliminary findings have been provided in the previously submitted Literature Review and Mid-Fieldwork Progress Report deliverables.

1.4 Organization of the Report

This introductory chapter has outlined the project background and the overarching goals of the project. Section 2.0 describes the research design developed to satisfy those goals and supporting objectives. These materials are supplemented with technical discussion of social network methods and findings in Appendix B. An interview protocol used to organize discussions with our core sample of drift gillnetters is provided in Appendix G.

Section 3.0 describes the Cook Inlet drift gillnet fishery and oil and gas industry, and aspects of both as needed to communicate the nature of their historic and potential future interactions on the OCS. A description of the 2003 drift gillnet regulatory season supplements this discussion, and is provided in Appendix C. Appendices D, E, and F also supplement the section. Appendix D summarizes relevant aspects of the OCS regulatory framework, Appendix E reviews media reports of oil and gas industry accidents on Cook Inlet between 1960 and 2003, and Appendix F describes a fishing career on Cook Inlet as told by a retired drift gillnetter.

Industry interaction issues are discussed at length in Section 4.0, and mitigation alternatives are discussed in Section 5.0. Section 5.0 draws from each of the previous chapters and on the annotated bibliography provided in Appendix A.

Section 6.0 summarizes the project and key research findings. Section 7.0 provides the references cited in the body of the report.

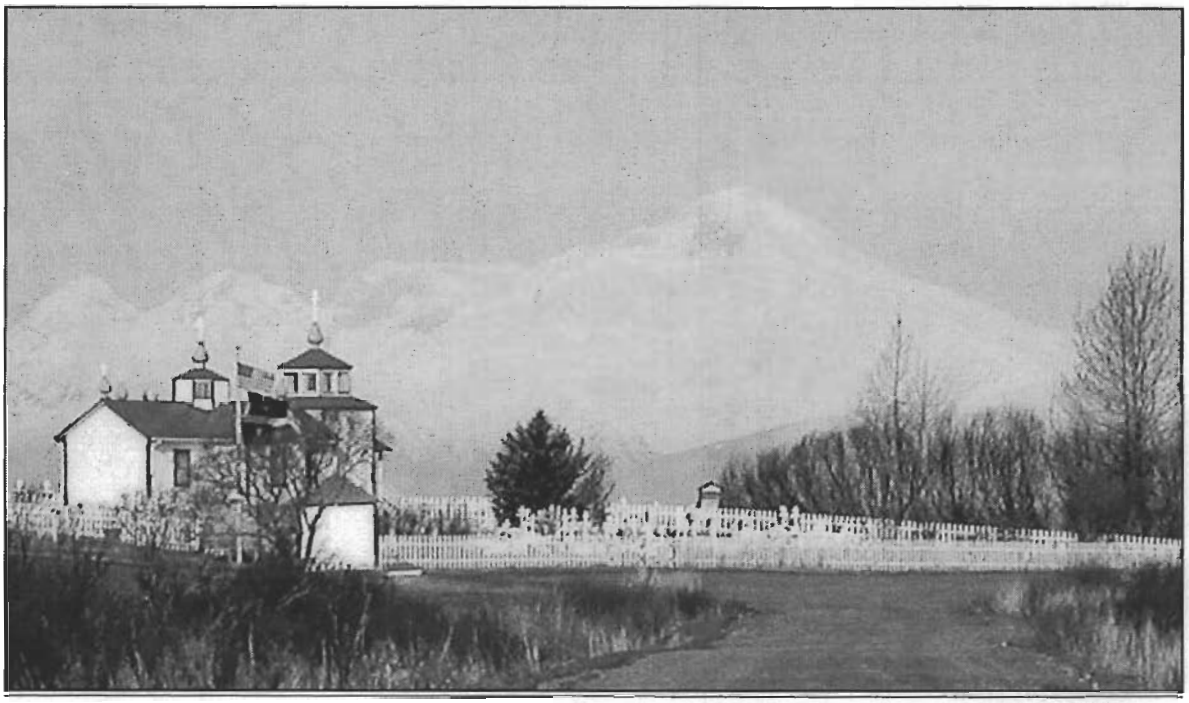


Figure 1-4 Mt. Iliamna, a Glaciated Volcano, Soars above the OCS on the Western Shore of Cook Inlet

2.0 Research Methods

This section describes the research methods and design used to meet the project goals and objectives. A social network methodology is emphasized and described at the level of detail necessary for understanding our sampling rationale and subsequent analysis of the perspectives and experiences of seasoned drift gillnetters. Additional aspects of our approach to primary and secondary source data collection are reviewed in brief. Appendix A of this report provides further detail regarding the social network methodology and its results.

2.1 Overview of Research Methods and Data Analysis

Meeting the goals and objectives of the project required that IAI attend to three basic research priorities. These were: (1) in-depth attention to the socio-political nature of the Cook Inlet drift gillnet fishery, (2) development of a scientifically sound and objective approach to the topics of inquiry, and (3) collection of reliable information for purposes of valid and meaningful analysis. The following reviews the most pertinent elements of the research design based on these needs.

Multiple research methods were used during the course of the project, as described below. Interview sampling was systematic, thoroughly documented, and designed to allow for testing of pertinent research hypotheses. We sought to observe activities in a range of geographic and social settings. Interview and observational data were organized by topical category and by informant, and the resulting databases were systematically consulted to build the analyses. Wherever possible, the analyses were based on information gathered through multiple research methods or measures. This helped ensure that the information collected was reliable, and the analyses were valid and meaningful.

2.2 Summary of Research Interaction in the Study Area

As summarized in Table 1-1, the study team conducted various forms of social research during the 2003 drift gillnet season. The information generated through these methods contributed to the various analyses needed to meet project goals and objectives, including thorough description of the fishery and the OCS interface issues, and identification of feasible mitigation alternatives. This work involved:

a) Compiling, analyzing, and synthesizing various relevant secondary source information;

b) Developing a literature review of fisheries and oil/gas interactions and mitigation issues from maritime contexts around the world; [8]

c) Observing and documenting fleet activities in and around the region's harbors throughout the season;

[8] Findings are provided in the Literature Review project deliverable, and in Appendix A of this report.

d) Systematically identifying 149 drift gillnet fishery participants through social network sampling, and conducting preliminary phone interviews with a majority of these persons;

e) Conducting in-depth interviews with 52 seasoned drift gillnetters, many of which included mapping exercises to determine and depict spatial aspects of fleet activities, and 31 of which were guided by an ethnographic protocol (Appendix F);

f) Conducting some 25 unstructured interviews with persons active in the fishery processing and support sector;

g) Engaging in scores of in-depth discussions with local, state, and federal government officials involved in marine fisheries management and/or oil and gas industry activities in the region;

h) Engaging in participant observation case studies with five different drift gillnet operators on five drift gillnet trips in Cook Inlet;

i) Engaging in interview and observational work on a drilling platform above Cook Inlet;

j) Identifying a group of (19) highly recommended and seasoned drift gillnet fishery participants; and

k) Conducting, facilitating, and documenting a series of in-depth interviews, focus group meetings, and follow-up interviews with those key informants.

2.3 Interview Sampling and Social Network Analysis

A social network sampling process was used and rigorously documented to identify persons with extensive experience in the Cook Inlet drift gillnet fishery, and to better understand the social structure of the fishery. Experienced captains were initially identified through our discussions with ADF&G staff, and each was subsequently asked to identify other highly experienced fishery participants. This process was repeated until no new seasoned participants were named by peers.

This work was conducted in all of the main communities along the Kenai Peninsula. Field staff made directed efforts to contact and interview otherwise potentially obscured groups, including persons of Russian ancestry (most of whom live in the Nikolaevsk and Ninilchik areas), and fishery participants who live in the Pacific Northwest, but who travel to drift fish in Cook Inlet in the summers. Given that members of the out-of-state (termed “Outside” in Alaskan vernacular) fleet typically make a quick exit south at season’s end, the field team focused on working with these participants in Alaska during the early part of the drift gillnet season.

Groups of highly recommended and socially integrated participants were ultimately identified through social network analysis. The core of the sample is depicted in Figure 2-1 below. Incoming arrows in the figure depict incoming and outgoing nominations, proxies for

interpersonal social connections. We emphasize the value of the social network method for identifying and consulting with persons of extensive achieved status.[9] Scores of fishermen were consulted for their fishing knowledge and expertise during the course of the project, but these were the most highly recommended, and those with whom we worked most extensively.

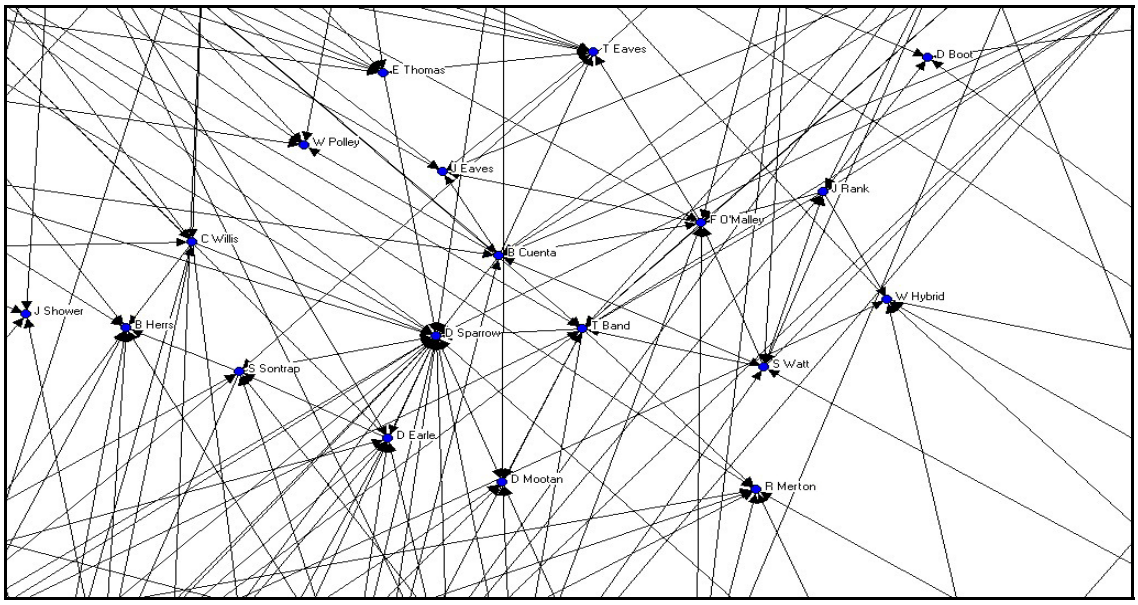


Figure 2-1 The Most Frequently Recommended Drift Gillnetters

Given our interest in using the reported perspectives and experiences of seasoned drift gillnetters to aid in describing and explaining the issues and processes of relevance to this study, we provide in Table 2-1 the pseudo-identities of the core group. Readers may thus "locate" the status of the informants within the core network.[10] Based on the respect given the core participants by their peers, and their heightened level of integration with the overall sample, we emphasize the importance of their experiences and perspectives in this report, and refer to them by pseudonym throughout relevant portions, especially in Sections 4.0 and 5.0. For purposes of additional reference, the table also depicts the fisherman's general area of residence (north or south of Ninilchik), and whether or not he is affiliated with UCIDA.

[9] This reputation-based method may be seen as introducing sampling bias in that it does not include beginners whose experiences are useful for understanding the issues addressed by this study. Some beginners were included in the more generalized sample, however, and moreover we submit that the seasoned fishermen were once also beginners and remember in empirical terms that earlier phase. They are therefore uniquely situated to and do report both their own period of learning, and their observations of novice captains active in the fishery today. It may also appear that the sample does not include highly independent and/or asocial participants. This is not necessarily the case since aloof and independent participants can also be highly productive fishery participants, and are often well-respected by peers (Glazier 2002).

[10] Of note in the table, and speaking to the value of the social network sampling method weighed against more traditional but less systematic methods for identifying ethnographic informants, Mr. D. Sparrow was contacted early in the study on a tip that he was highly knowledgeable and experienced. Subsequent interaction gradually proved this to be true and he was eventually judged also to be a highly analytical insider – in short, an ideal informant. The more systematic method subsequently supported that assessment.

As revealed in the table, through the hypothesis-testing investigations described in Appendix B, and throughout the course of this project, UCIDA is an important institution for fishery participants in the region. While many fishermen also speak for themselves, the Association serves an important coalescing and representative function. This may ultimately prove to be critically important in implementing strategies to mitigate potential fishery-industry problems on the Cook Inlet OCS.

Table 2-1 The Core of the Network Sample: The Most Highly Recommended Seasoned Drift Gillnetters

Drift Gillnetter	Residence	UCIDA Afffiliation	Nominations	Normalized In-degree**	Rank
D. Sparrow	North	Yes	23	15.54	1
T. Band	North	Yes	11	7.43	2
B. Herrs	North	Yes	9	6.08	3
D. Earle	North	Yes	8	5.4	4
T. Eaves	North	Yes	8	5.4	4
R. Merton	North	Yes	8	5.4	4
F. O'Malley	Interface*	Yes	8	5.4	4
B. Cuenta	North	Yes	7	4.73	5
D. Mootan	North	Yes	7	4.73	5
E. Thomas	North	Yes	7	4.73	5
C. Willis	North	Yes	7	4.73	5
J. Eaves	North	No	6	4.05	6
W. Hybrid	South	Yes	6	4.05	6
W. Polley	North	Yes	6	4.05	6
S. Sontrap	North	Yes	6	4.05	6
D. Boot	South	Yes	5	3.38	7
J. Rank	South	No	5	3.38	7
J. Shower	North	No	5	3.38	7
S. Watt	North	Yes	5	3.38	7

* This informant is relatively well-integrated with drift gillnetters in both parts of the study area.
** An indicator of peer-reported achieved status in the fishery

2.4 Group and Focus Group Meetings

Research staff held a series of meetings with UCIDA representatives. These were held on three different occasions in order to: (a) document the perspectives of group leadership on fleet activities, operational economics, and other factors of importance, (b) elicit spatial information that would aid in depicting the historic and contemporary range of the drift gillnet fleet in the region, and (c) document perspectives on issues associated with mitigation of potential problems between the fleet and offshore industry on the OCS.

Focus group meetings were held with our sample of core participants late in the course of the study. These served to: (a) refine our understanding of drift operations and spatial aspects thereof, (b) provide a venue for in-depth discussion of mitigation issues, and (c) enable the participants review and comment on study findings to date. A series of follow-up phone calls was conducted with the core group and other knowledgeable fishermen through the analytic and report-writing phases of the project as needed to further investigate or refine our understanding of specific issues and questions.

Figure 2-1 Photo of Tanker Traffic Taken *en Route* from Ethnographic Work on Shell Platform A

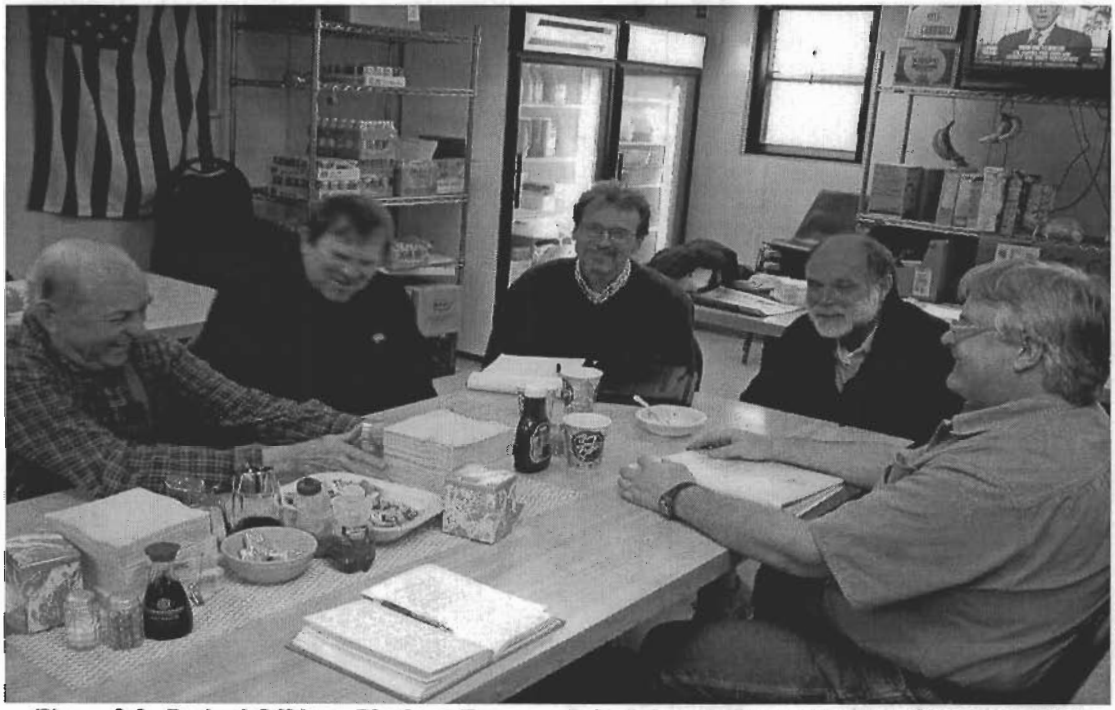


Figure 2-2 Retired Offshore Platform Foreman (left) Relates a Humorous Story from Days Past

3.0 The Oil and Gas Industry and the Drift Gillnet Fishery in Cook Inlet

This section reviews in brief the history and current status of the Cook Inlet oil and gas industry, and provides a more in-depth description of the drift gillnet fleet. The description is based on archival research, interview data, and participant observation. It is provided as context for understanding the historic involvement of Kenai Peninsula communities in marine fisheries and oil and gas industry, and for examining physical interactions between the industry and fleet on the OCS should oil and gas exploration move forward in future years. By extension, the section also provides materials needed to gauge the implications of mitigation options for the region, as developed in later sections.

3.1 Oil and Gas Industry Operations in Cook Inlet

Production of oil and gas resources in the state jurisdiction waters of Cook Inlet now has a lengthy history. Current interest in portions of the Cook Inlet OCS actually relates to a series of exploratory efforts conducted in the 1970s and 1980s, and to industry activities associated with the Cosmopolitan Unit. Cosmopolitan straddles state and federal waters northwest of Anchor Point (MMS 2003a:I-2). This subsection describes some of the history and contemporary characteristics of oil and gas development in the region. While production in the upper reaches of the Inlet has peaked, the potential for significant new findings underlies the industry's current interest in the area.

3.1.1 History and Overview

Oil was observed in Cook Inlet as early as 1853. Seepage around Inishkin and Chinitna Bays, and what was subsequently called Oil Bay, made the increasingly valuable resource readily visible. A formal claim was first made near the town of Kenai on the eastern side of the Inlet in1892, though no work was done to recover the oil. Pomeroy and Griffin are said to have staked claims near the head of Oil Bay in 1896. The Alaska Petroleum Company was organized to work the site in 1897, and drilling was underway by 1901. Some 50 barrels of oil were recovered daily until the well was abandoned in 1903. Similar efforts were undertaken in adjacent areas during the same period by the Alaska Oil Company. Outcomes also were similar, and though some oil was recovered, the wells were soon abandoned (Moffitt 1974:133-137).

World War I and particularly World War II led to increased demand for petroleum products in Alaska and across the U.S. But oil and gas exploration yielded little product until 1957 when extensive deposits were discovered by Richfield Oil Company at what was subsequently called the Swanson River Oil Field. The first gas field discovery at the site is still producing. This find led to a leasing boom in the Alaska Territory. The State of Alaska held fifteen competitive lease sales between 1959 and 1965 (Naske and Slotnick 1994:242-247). By 1958, over 100 oil companies were actively leasing 18 million acres in Anchorage (Roderick 1997:83). A pipeline was constructed in 1960 to transport natural gas from the Kenai Peninsula to Anchorage where it could be sold and transported to various locations in the state and to other states to the south.

Another pipelinewas built during the same year to move oil from the Swanson River field to Nikiski.

The State of Alaska held its first offshore lease sale in 1959, a 77,000 acre area in Upper Cook Inlet. The first offshore oil discovery was made in 1962 at Middle Ground Shoals, soon followed by discovery at Beluga River. During this same period, Standard Oil broke ground for the first Alaskan refinery since the Katalla operation closed in the 1930s. The first offshore oil platform arrived in Cook Inlet in 1964, the same year during which a large discovery was made offshore the McArthur River (Kenai Peninsula Borough 2003). Industry activity was extensive during the 1960s and 1970s, with 15 active offshore facilities in Upper Cook Inlet (State Of Alaska 1999a:6-14).

The State's oil lease areas in Upper Cook Inlet cover approximately 4,400 square miles. There are now seven producing oil fields in the basin. Reserves are estimated at 76 million barrels of oil and three trillion cubic feet of natural gas. Recent industry operations include activity at the Tyonek Deep oil platform, the Westfork gas project in the Swanson River field, and the Osprey platform on Redoubt Shoals (Kenai Peninsula Borough 2003). Oil and gas field lease units in state jurisdiction waters include, from north to south: the South Middle Ground Shoal Unit (UNOCAL); the Kenai River Unit (Marathon Oil Company); the Kasilof Unit (Marathon); the Ninilchik Unit (Marathon, UNOCAL, Anadarko, ConocoPhillips AK, Inc., Aurora Gas, Inc., and ConocoPhillips Company); and the South Ninilchik Unit (UNOCAL).

The Spark and Spurr platforms were shut-in in 1992 following decline in production. The Dillon platform stopped production in January 2003, and Baker was scheduled for the same in April 2003, with shut-in mode likely to follow. Some analysts suggest that shut in costs are in the range of $1.5 to $2 million and that full abandonment is significantly more costly. Such costs are therefore factored into operational plans amidst conditions of diminishing resources in the upper regions of the Inlet.

3.1.2 The Economic Importance of the Oil and Gas Industry in the Cook Inlet Region

The offshore petroleum industry has been central to the economies of Kenai Peninsula Borough, Southcentral Alaska, and Alaska itself since offshore production was initiated in 1967. As noted above, production peaked in the 1970s, and while the number of persons employed in the industry has been consistent or growing, the industry has employed a smaller percentage of the regional population. The industry reported taxable properties approaching $500 million in the 1990s, a major source of municipal revenues through property taxation (State Of Alaska 1999; Kenai Peninsula Borough, 2003; Terry et al. 1980:374-386). Given the importance of the oil and gas industry to the region and State of Alaska, and the ongoing national demand for petroleum products and by-products, the industry is likely to remain active in state jurisdiction waters of Cook Inlet, and in future years perhaps on the OCS as well. Thus, the potential for future interaction with the region's drift gillnet fleet is equally likely.

3.1.3 Prospects

Cook Inlet is a geologic basin with a relatively well-understood yield potential notable in state waters and on the OCS within a line from about Falls Creek southwest to the COST well[11] at 153°10′ N. Increased sediment thickness and associated source rock potential here are correlated with enhanced potential for oil and gas (Alaska Division of Oil and Gas 1999a). There is a large submerged acreage of particular interest in this regard on the OCS in the southerly portions of Upper Cook Inlet and northerly reaches of Lower Cook Inlet. The entire Cook Inlet OCS planning area extends far to the south and west of this particular zone, and in total encompasses about 2.5 million acres. Industry activities may occur in other Cook Inlet OCS areas in future years, but current commercial attention is focused particularly on the northeast OCS described above (Craig 2004).

For the purposes of EIS analysis, MMS assumes some 140 mbbl of oil and 190 bcf of natural gas may be recoverable from any given single development potentially resulting from lease sales on the Cook Inlet OCS (MMS 2003a:ES-I). Various companies continue to show interest in exploring and developing State lease areas in the vicinity of the northeastern OCS such as the Cosmopolitan Unit. Both traditional offshore platform and evolving shore side directional drilling technologies are being considered for use in the area of particular interest.

3.1.4 Relevant Aspects of the MMS Scenario for Cook Inlet OCS Development

This sub-section describes the nature of OCS operations under proposed scenarios of limited and site-specific exploration and potential production. As stated in the Cook Inlet EIS (MMS 2003a:ES-1), MMS does indeed anticipate that if exploration and production activity is to occur on the Cook Inlet OCS, it will be limited in scope and highly focused in area:

> The proposal for each sale is to offer for leasing 517 whole or partial lease blocks in the Cook Inlet OCS Planning Area, an area encompassing approximately 2.5 million acres. The proposed sale area is seaward of the State of Alaska submerged lands boundary in Cook Inlet and extends from 3-30 miles offshore from Kalgin Island south to near Shuyak Island. The proposed sale area excludes Shelikof Strait. Although water depths may exceed 650 feet, Minerals Management Service (MMS) expects most, if not all, exploration and development activities will take place in shallower water. For purposes of analysis, we assume that 140 million barrels of oil and 190 billion cubic feet of natural gas could be discovered and produced from a single development as a result of either or both sales. Only a small percentage of the blocks available for lease under the Proposed Action for Sales 191 and 199 likely would be leased. Of the blocks that would be leased, only a portion would be drilled. Of these, only a very small portion, if any, likely would result in production.

[11] Continental Offshore Strategic Test Wells were OCS exploratory wells drilled in the mid-1970s in Lower Cook Inlet and northeast Gulf of Alaska (see Minerals Management Service 1980).

If activities are to move forward, a range of industrial activities would be associated with exploration, production, and post-production phases of a drilling operation on the OCS. Of these, five types of prospective activities or potential events present the possibility of affecting the drift fishery and its participants. These potential impacting agents are: (1) emplacement of a drilling platform in an area where drift gillnet fishing occurs or has historically occurred and could disrupt navigation and/or fishing, (2) oil spills or blowouts that could affect the resource or disrupt the fishery, (3) increased vessel traffic in the Inlet, (4) discharge of drilling muds or other drilling-related materials into the water column in a manner that would affect salmon, and (5) seismic testing during periods and in locations that could affect salmon behavior,

MMS has drawn on the best available research and monitoring information to address each of these impacting agents in its EIS. Relevant EIS findings are depicted in summary form in Table 3-1 below.

Table 3-1 Summary of EIS Analysis by Issue of Concern for Drift Gillnetters

Agent/Concern	Summary MMS EIS Analysis Based on Proposed Scope of Action
Emplacement of Drilling Platform in Fishing Grounds Could Affect Drift Gillnet Operations	"Offshore construction, platforms, and pipelines are expected to result in some space-use conflicts; however, these are expected to be few in number and minor in scope."[1]
Oil Spills or Blowouts Could Affect the Resource and the Drift Gillnet Fishery	"Small oil spills are not expected to result in closures, or reduced market values over the life of the proposal." "Based on the losses from a closure and the annual average value of the Cook Inlet commercial fishery (about $41 million), the unlikely 4,600 bbl oil pipeline in Lower Cook Inlet could cause closure of the fishery over tainting concerns and result in an estimated loss of about 22% to 37% per year for two years. It is possible that the fishery could be closed for a whole year, resulting in a 100% loss for that year . . These effects are considered unlikely given the chance of a spill occurring." [1]
Oil and Gas Industry Activities on the OCS could Increase Vessel Traffic in Cook Inlet	"Space conflicts associated with the transportation of platforms or logistics (supplies or personnel) between construction or production sites and shore bases will need to be coordinated between the lessees and operators and the commercial-fishing industry . ." [2]
Discharge of Drilling Muds Could Affect Salmon Migration Patterns	"Drilling discharges from exploration are not expected to affect commercial fishing due to the limited area affected near the platform discharge point." [1]
Seismic Testing Could Affect Salmon Behavior	"Seismic surveys, planned and coordinated with the commercial-fishing industry, are expected to have a minimal effect on the Cook Inlet commercial-fishing industry." [1]
[1] Analysis of potential effects from MMS (2003c: Table II.B-2) [2] Analysis of potential effects from MMS (2003a:IV-137)	

Under conditions of what is projected to be a limited production scenario, MMS (2003a:IV-43) reports that operations would require construction of one drilling platform, up to 50 miles of offshore pipeline, and up to 75 miles of onshore pipeline. The latter pipeline would connect offshore pipe at the Anchor Point landfall to the Nikiski oil and gas complex.

3.2 The Cook Inlet Drift Gillnet Fishery

The drift gillnet salmon fishery has a long tenure in Cook Inlet and remains an important aspect of the region's economy and way of life. The treacherous nature of Cook Inlet, and the productive nature of its fisheries lend both challenge and reward to its participants. While drift gillnetters have expressed concern about the potential for new oil and gas activity in the vicinity of their fishing grounds, they face more certain challenges as well. This section describes the history of the fishery, and the range of environmental challenges encountered by the fleet at the beginning of this new century.

3.2.1 Early History

The salmon fishery of Cook Inlet has been an important aspect of life on Kenai Peninsula for centuries. The Dena'ina Indian village of Skitok at the mouth of the Kenai River was a prime fishing locale centuries before the arrival of Russian fur traders (Osgood 1974:9). The Russians later relied heavily on salmon at their trading posts throughout the region. But the commercial fishing era did not begin until the United States purchased Alaska from the Russians (Naske and Slotnick 1994:101).

Cook Inlet's commercial salmon fishery was established in 1882 when a cannery was built on the north bank of the Kasilof River (Sherwood 1974:105). The fishery has always been a dangerous one, and in 1898 the Fish Commission described commercial pursuit of salmon here as extremely hazardous given its "swift currents." During the early era, much of the harvest was taken by trap. In 1896, the Kasilof cannery reported that 87 percent of the red salmon catch was taken with traps. The cannery employed about 35 harvesters during that period (Fribrock 1999).

By the turn of the twentieth century, the salmon fishery had become the economic mainstay of the region. It remained so up until the Second World War. Salmon harvest during the first half of the century peaked in 1939 throughout Alaska, then entered a long period decline until it was temporarily halted by the institution of conservation measures following establishment of statehood in 1959 (Colt 1999:7).

In the early days of the drift gillnet fishery, canneries leased vessels to the fishermen. A woman contacted during the field phase of this project recalled that her father and his friends paid their cannery 22 percent of earned revenue for use of the boat, and 11 percent more if they used company-owned gear such as nets and line. Different canneries purchased and leased different types of boats. For instance, Kenai Packers bought and leased metal boats, while Ward's Cove and R. Lee purchased and leased wood vessels.

The high rate of efficiency of fish traps preceded the conservation measures. Use of traps was widespread as they enabled canneries to maximize yield while minimizing labor and equipment costs. Pile-type traps required a large initial investment to drive piles into the Inlet bottom. This limited competition from small independent operations and required little maintenance, but was

accompanied by strong opposition from independent operators and reportedly led to fierce debate in Congress about its effects on the sockeye salmon stock and local employment:

> Representative John Rankin of Mississippi said that in traveling along the coast of British Columbia he saw a large number of people out in small fishing boats making their living from the sea, but that in Alaska he found the traps had virtually driven the little man from the fishery (Cooley 1963:120).

The U.S. House of Representatives passed the White Bill of 1924 in response to outcry from independents. The Bill included the following provisions: (a) it outlawed "exclusive fishing privileges," (b) established that "no fixed gear could be set in waters where the distance from shore to shore was less than one thousand feet, or within five hundred yards of any salmon stream, (c) made "it unlawful to place traps in bays, inlets, or estuaries less than three miles wide or within one mile of the mouth of any stream," and (d) did the same for purse seines (Cooley 1963:120-121).

With accumulation of capital and clout, cannery operators were relatively more capable than independents of attaining their interests through politics. Despite arguments to the contrary offered by independents, cannery representatives successfully argued that the resource could sustain contemporary harvest levels. Restrictions on traps and purse seines were eventually removed under pressure from cannery operators.

But the trend shifted in 1930 when the Commissioner of Fisheries introduced restrictions by which "both the number of traps and the number of operating canneries were reduced by around 50 percent" (Cooley 1963:135). The measure was aimed both at easing pressure on the resource and reducing production levels that at the time were driving down salmon prices.

Federal conservation measures were nevertheless unable to reduce declining salmon runs throughout the 1940s. As the resource diminished, market prices encouraged further exploitation. This situation continued essentially until management of the fishery was turned over to the State in 1959 (Cooley 1963:165-166). In the last year of federal control of the fishery, "fishermen [in Cook Inlet] caught the fewest salmon taken since the earliest days of the fishery - only 1.3 million" (Rearden 1983:77). Once the state took control of the fishery, the stock began to slowly rebuild until 1982 when the Cook Inlet fishery had its largest year ever, with 3.1 million landed salmon.

Figure 3-1 Old Wooden-Hulled Drift Boat, Long High and Dry at Ninilchik

3.2.2 Labor History

One of the events that has some bearing on the course of history of the drift gillnet fishery was the action of the Federal Trade Commission in 1954 to enforce a 1942 Supreme Court decision that "held that fishermen were businessmen and not the employees of the cannery to whom they sold the fish." The argument was that "fishermen's unions, being composed of independent producers and not employees, could not negotiate with the packers to establish the price that the fishermen would receive for their catch" (Roppel 1986:111). This effectively rendered illegal any concerted action on the part of harvesters to affect market conditions. But the ruling did have the indirect effect of opening up the area's fisheries to more localized participation since it broke the hold of the Alaska Fishermen's Union, historically dominated by persons residing outside the region. The labor situation would gradually change over time, as noted in subsequent sections.

3.2.3 Into the Contemporary Fishery

Increased drift gillnet activity followed naturally the trend of increasingly efficient and readily available outboard engines and hulls. The latter were and are typically steel and aluminum in Alaska. This era preceded another decline in the resource base in the 1970s, which apparently served to promote establishment of a limited entry program in 1973. The fishery gradually rebounded, eventually reaching record production and profit during the late 1980s. Increasingly efficient navigation and other marine electronics have become widely used with positive results.

Canneries used to lease boats to the fishermen (as noted above), but today virtually all contemporary participants own and maintain their own. There are loan arrangements and close affiliations between modern processors and harvesters, but the arrangements are generally more flexible today and mediated by external financiers. While there are several boat builders active in the region, many of the boats currently operating on Cook Inlet today are several decades old. Boats used by participants residing in other parts of Alaska or in other states are typically left for the off-season in the storage yard of the processor with which they are affiliated. Some local participants also store their boats in such yards, while others store them on their own property.

Figure 3-2 Drift Gillnet Vessels in Kenai Area Storage Yard, Spring 2003

Significantly, many drift fishery participants have in recent years opted not to fish their permits, apparently recognizing the probability of poor return against capital outlay. There were 572 active/viable Cook Inlet drift gillnet permits in 2002, but the number actually fished was 409. According to key informants, the trend of non-use does indeed reflect strategy rather than a level of desperation that would lead to the forfeit of permits since participants "who've been around long enough, know the game."

Despite current trends, many fishermen clearly love the lifestyle. As one noted optimistically, "as soon as prices pick up, you better believe those permits are gonna' get fished, and it's just a matter of time." In the meantime, however, marketing problems abound, and many participants are reportedly relying on other skills and opportunities to earn a living.

The State of Alaska Commercial Fisheries Entry Commission administers Cook Inlet drift gillnet permitting. Permits are transferable, and therefore there is extensive turnover and changing participation in the fishery over time. Permit values have varied dramatically in recent years, peaking at $202,058 in 1990, and falling to their lowest value of $11,500 in 2002.

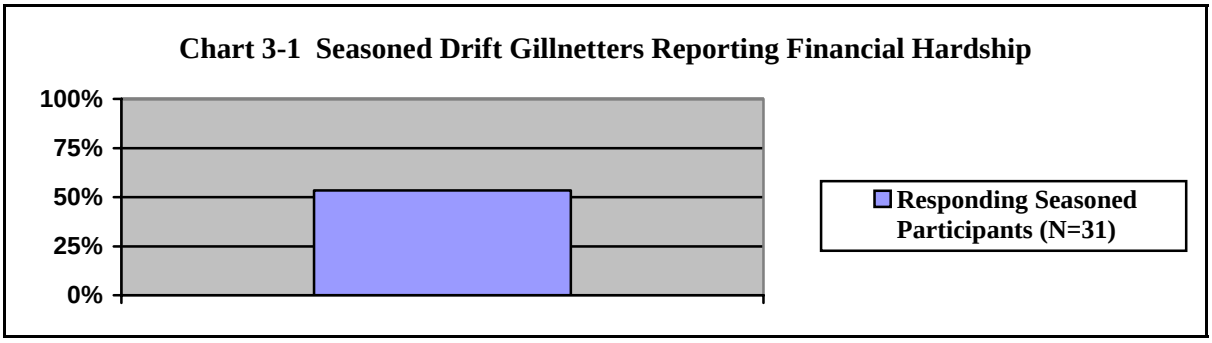
Salmon fisheries are in widespread decline across Alaska. This is blamed partly on poor prices that are, in turn, related to competition with farmed salmon product. But as noted by McGoodwin (1990), a host of factors underlay the difficulties of small vessel fishing fleets around the world, including, but not limited to: frequent market fluctuations, rising fixed and trip costs, competing fleets, and demanding regulatory regimes.

While this research project involved some limited assessment of change in salmon migration and abundance patterns, there was little evidence that these factors are or are perceived as important sources of change in the contemporary fishery. While pink and chum salmon are no longer pursued in the northerly reaches of the Inlet as in years past, the shift is probably more closely associated with diminished market prices than with migratory changes, although both fishery participants and biologists agree that the species is not being tracked.

The common sentiment regarding general patterns of abundance and migratory patterns is that these are cyclic. This is expressed by F. O'Malley, one of the highly recommended fishermen in our sample:

> "No big change in the migration of the salmon that I've noticed. There may be fewer fish earlier in the season than in years past. But it's cyclical. In the '60s, we had good fishing and then in the '70s it was poor. We had some really lousy years in mid-70s due to poor catch and escapement. Then the stocks were rebuilt, and they got back to normal and in '86 to '92 they were good. Now we are in a decline again."

As described throughout this report, drift fishery participants blame their fishing problems primarily on the market. These have wide ranging effects, and problems in the fishery are not without apparent effects at the household level. As depicted in Chart 3-1 below, over half of the 31 drift gillnetters participating in our protocol-driven interviews reported experiencing household finance problems. These problems may or may not be fully and directly related to participation in marine fisheries in Alaska, but in any case it may be correctly inferred that such participation is not *solving* money problems as it did for some, for quite some time, in the boom years of the late 1980s and early 1990s.



In responding to the current economic situation, certain processors and other fishing interests in Kenai Peninsula Borough have begun to market Cook Inlet salmon as a uniquely "wild" product, similar to a program undertaken by marketers active in the Copper River fishery. Although processing plants in the regions are still routinely called canneries, in fact most fish is frozen prior to distribution. The industry as a whole is focusing increasingly on the production of high-quality and value-added products. There is a growing perception that adding value to salmon through smoking, de-boning, and filleting will lead to increased profits. While such efforts may bear some positive results, it should be noted that improved economic conditions in the fishery may have the effect not only of heightening profits in the distribution sector, but may also improve the chances that marginally situated harvesters can perpetuate a much valued fishing lifestyle.

3.2.4 Geographic Aspects of the Cook Inlet Drift Gillnet Fishery

Extensive effort was applied during the course of this project to determine and document spatial aspects of drift gillnet operations in Cook Inlet. The in-depth interviews we conducted involved general and specific questioning about spatial aspects of drift fishing, and a series of mapping exercises. The latter required that drift gillnetters indicate on specially designed maps where they used to fish, where they fish now, and other spatial aspects of their operations and those of the fleet in its entirety. We compiled this information and developed a draft composite map of the historic and contemporary range of the fleet, areas of contemporary focus across the drift season, areas and locations of concentrated runs and associated harvest areas now and over time, and areas of known interaction with other fleets. This map was subsequently used for discussion with, and repeatedly revised by, our sample of highly recommended drift gillnetters.

The essential finding of the geographic analysis is that strategy varies so extensively across the fleet that documentation of its overall range over time is the only information that can be provided with confidence. For instance, it was not possible to pinpoint areas where "the fleet" focuses effort during specific parts of the season since some experts report fishing in certain

areas during certain parts of the season, and others report more favorable conditions in specific locations elsewhere. Still others report the best fishing occurred at different times during a given season, and at disparate locations. Reports about migratory patterns of the resource over time were similarly mixed. While there was general agreement that salmon abundance and migration patterns were cyclic in nature, questions about specifically "where" and "when" variation has occurred led to highly variable accounts across the sample. In sum, questions about specific spatial patterns in the fishery tended to yield little consensus.[12]

Less specific questioning, and analysis of interview and mapping data with less concern for geographic specifics, allowed documentation of fleet operations with more confidence. Subsequent review of simplified maps depicting the range of the fleet, general areas of historic activity, and general areas of interaction were finally confirmed by the experts. For sake of clarity, Map 3-1 emphasizes the general range of the fleet. General areas of historic fishing activity and general areas of interaction with other fleets are provided, but with the caveat that these parameters should be considered more approximate than the overall range.

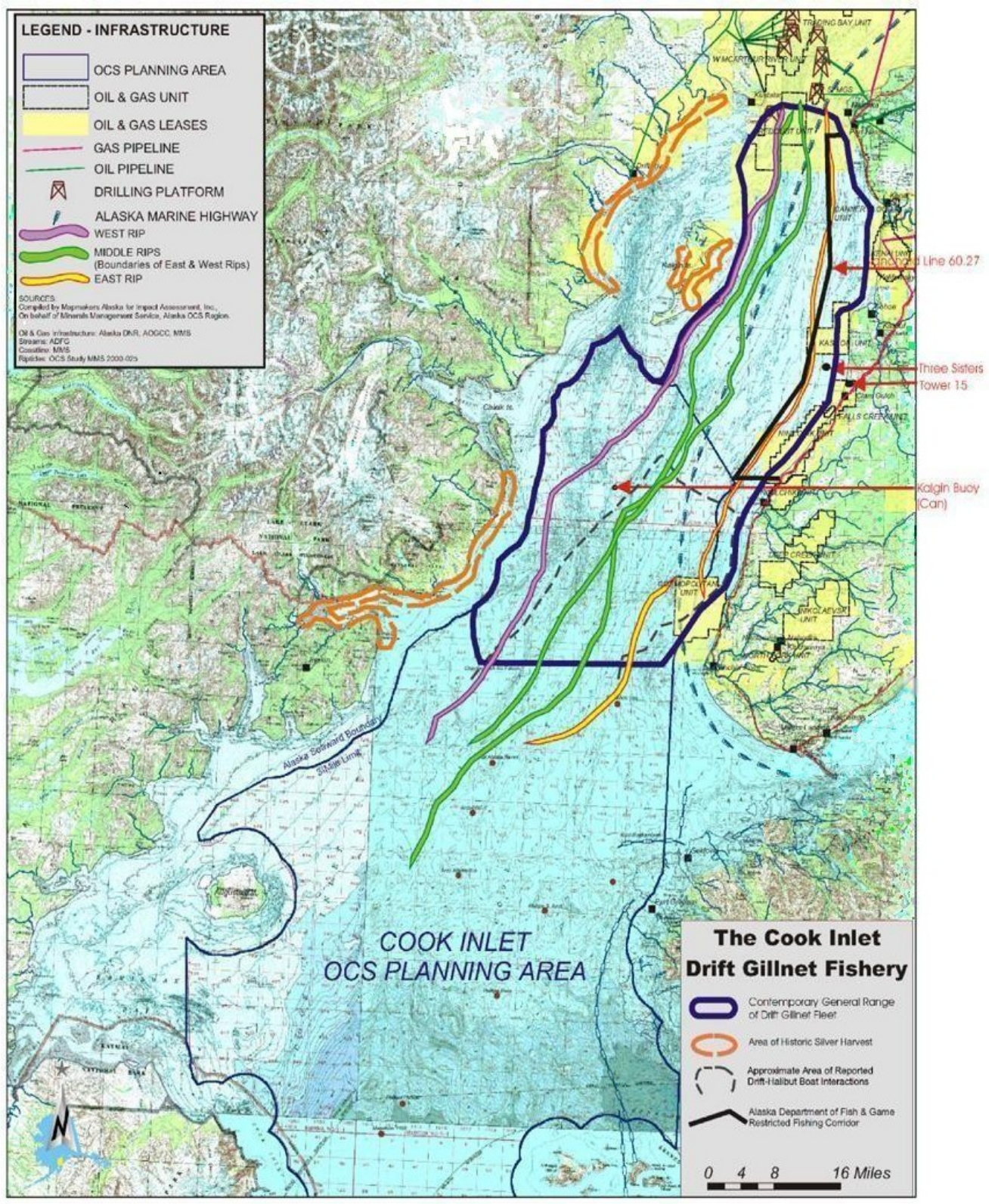
Thus, Map 3-1 is a finalized composite GIS map compiled to fulfill the spatial-descriptive objectives of the research. In reiteration, the product is based on: (a) extensive and detailed initial input offered by various drift gillnetters, (b) subsequent revision based on careful comparative analysis of interview and mapping data, and (c) repeated review and refinement by our panel of highly recommended drift gillnetters.

As noted in the legend, the dark blue line indicates the parameters of contemporary drift gillnet fleet activity. The southern boundary of activity approximates portions of the "Anchor Point line" (the APL). This is the ADF&G southern limit on the fishery, extending from the shoreline at Anchor Point along 59° 46.2' north latitude, to the shoreline on the west side of the Inlet south of Mt. Chinitna.

A combination of bottom conditions, salmon migration patterns, and other factors render the first six or so miles of the Inlet due west of the Anchor Point shoreline and northeastward to a point about three miles offshore Ninilchik largely unused by the drift gillnet fleet. The fishery starts in earnest further west along the APL. We term this zone an "Area of Special Consideration." The zone is highly significant for the purposes of this study given its proximity to areas of contemporary interest to the oil and gas industry. It is depicted and discussed in more detail in sub-section 5.2.1 of this report.

The black line depicted west of the eastern shore of the Inlet from south of Point Nikiski south to just north of Ninilchik and three miles offshore is also an ADF&G regulatory boundary. This is "the corridor," a highly regulated area of escapement managed via periodic openings and closures. The black line denoting the western boundary of the corridor is sometimes crowded with vessels fishing waters immediately east of the regulatory line.

[12] Significant exceptions to this rule are *very* specific point locations such as the Kalgin Buoy or "can."



Map 3-1 The Cook Inlet OCS and the Drift Gillnet Fishery

The northernmost area of drift gillnet activity necessarily coincides with the ADF&G northern regulatory boundary. Moving south and west, the fleet follows the bottom contours around Kalgin Island to the Kalgin Island Buoy (the Kalgin "can"), itself a favored location for many drift gillnetters. Shallow areas are avoided as vessel navigation hazards. Net snagging and tearing concerns further limit interest in the shallows, though a few adept captains may target certain such areas. Most fishing occurs in relatively deep water. The western limit of the fleet is also limited by the shallows along the western side of the Inlet. Much of the southwestern range of the fleet approximates the three-mile limit and thus the OCS Planning Area boundary.

As indicated in orange, shallow waters in Chinitna Bay northward along the coast to about the tip of Chisik Island were once popular areas for late season pursuit of silver salmon. This was also the case for portions of the Kalgin Island coastline, and for the stretch of coastline west of Kalgin Island from Harriet Point to West Foreland. Given that the drift season is now limited to the early part of August, silver salmon can no longer be taken by the fleet during their late peak runs.

Of particular note on the map is the location of the east, middle, and west rip zones. While the location of these zones of interest to the drift fleet shifts somewhat with water volume and to a lesser degree with changes in subsurface strata, the symbols indicate their approximate locations over time. As noted throughout this report, these areas are highly favored for drifting.

3.2.5 The Drift Gillnet Season

The sockeye salmon season is essentially the month and a half it takes for the bulk of the salmon stocks to pass from Anchor Point to the mouths of their respective spawning grounds – the various streams and rivers along the Cook Inlet basin. In regulatory and management terms, the season usually lasts from mid-June to early August. Although salmon pass a given point along the Peninsula in waves rather than *en masse*, there is a general motion from the waters offshore Anchor Point up to the Forelands, where the run makes a broad clockwise turn and enters the Kenai and Kasilof rivers. While there are numerous exceptions to strategy, many drift gillnetters follow this general motion, typically fishing the first two or three openings near the southern line, then following the run or components of the run up past Kalgin Island toward the Forelands, then finally fishing along the shores of the Inlet above Kenai. Description of the 2003 regulatory openings is provided in Appendix C.

In the early days of the fishery, mobility was somewhat constrained by the horsepower of available motors. When boats were limited to eight or nine knots, Kenai and Kasilof captains fished primarily in the area around Kalgin and up at the Forelands. Ninilchik boats fished primarily in the middle of the Inlet, and Homer boats focused primarily on the southern reaches. Today, increased engine power and range enables captains to fish much larger portions of the Inlet during an opening. Some few captains with extensive horsepower and fuel capacity are now able to explore the full range of the drift zone in a single day.

Even in the earliest days there was strategic tendency to move with the fish from south to north as the season progressed. Kenai fishermen would sometimes spend the early portion of the

season down at Snug Harbor where there was a processor (after Snug Harbor closed, Kenai processors operated tenders in the southwest of the Inlet). Later in the season, the Kenai fleet would often fish northward. After the reds moved above Kalgin Island, the Kenai fleet would typically work from Kenai for the rest of the season. Likewise, late in the season, Homer and Ninilchik fishermen might fish periodically near the Forelands, but more typically around their own harbors. Again, the advent of faster boats has been important in increasing the range of the fleet. Reliable trailers, strong truck engines, and improved road conditions have also enabled expanded range, and some Homer drift gillnetters report transporting their vessels northward over the road system to follow the run.

Homer-based captains often start the season fishing the main rip offshore Anchor Point, returning to Homer at night. Many do this only for the first two or three openings, until the run has moved farther up the Inlet. Later, they may trailer or power their boats up-Inlet and moor in the Kenai, Ninilchik, or Kasilof harbors. If they travel by sea, a friend or family member may pick them up and drive them home. On subsequent openings, many drive to the harbor the night before and fish the opening in the morning. When the day is over and having delivered their fish, many tie up to a cannery buoy, take a cannery skiff in (or, if they are at Ninilchik, tie up to the dock and walk ashore), and drive back to Homer later.

Although contemporary Kenai and Kasilof participants generally moor their boats and deliver their fish throughout the season at their home port, they also tend to follow the general progress of the run from south to north. While some are highly mobile and fish the entire Inlet, many Kenai fishermen spend little time in the far south of the allowable fishing area, and Homer fishers rarely spend much time fishing off the Forelands.

3.2.6 Learning to Fish with Drift Gillnets

It is important to recognize at the outset that like any other enterprise, fishing, and especially fishing with nets in the treacherous waters of Cook Inlet, is an acquired skill. Seasoned veteran participants were once novices, and accumulated their expertise only through a long period of learning, some through interaction with experienced family members, others through fishing with friends, and others through trial and error on their own. Indeed, even the saltiest of our core group of fishermen spoke of learning something new every season.

Thus, while the experiences and perspectives of seasoned participants are emphasized in this report, it should be kept in mind that at any given time during the course of the drift gillnet season, the fleet is comprised both of persons who are highly experienced and who are passing into and through various stages of learning. As discussed in the subsequent section of this report, this variable level of experience has implications for potential interactions between the fleet and oil and gas industry infrastructure and support vessels on the OCS.

While the physical action of fishing a net alongside a drifting vessel is not a highly complex process in and of itself, there are many necessary actions and processes that lead up to, are associated with, and follow the activity. Among other actions and processes involved in the drift gillnet enterprise, one must learn to:

a) Navigate the vessel in the challenging waters of Cook Inlet,

b) Use the vessel's electronics and fishing gear with efficiency,

c) Acquire knowledge of and adhere to the changing general regulatory frameworks and specific rules used to manage vessel operations and the fishery itself,

d) Identify optimal tides and times for pursuing fish,

e) Understand the nature of rips and currents with regard to vessel safety and salmon behavior,

f) Assess the combined effects of wind, currents, and rips on the vessel and the behavior of the resource,

g) Detect potentially hazardous objects and obstructions in the water column that pose a threat to the vessel or nets,

h) Set, manipulate, and tow nets with and without fish and with and without obstructions and objects in the water column,

i) Pick salmon from the net and continue to navigate at the same time,

j) Navigate around other vessels including large tankers in treacherous conditions,

k) Develop relationships with buyer/processors, understand the nature of the local market and negotiate relationships with buyers as well as possible,

l) Maintain the vessel, engine, and gear, and/or develop ways to pay for others to do so,

m) Balance capital outlay in fixed and trip costs with revenue to keep the operation fiscally viable over time (if possible),

n) Identify, teach, manage, and pay skilled crew, and

o) Balance time spent preparing to fish, fishing, marketing or distributing the seafood product, and maintaining the operation with other forms of employment, with familial duties, and with other life activities and options.

Drift gillnet fishery participants thus operate with a base of accumulated knowledge, skills, and experience in a zone of activity involving others possessing varying levels of the same attributes. Knowledge of corridor and other openings and regulations, and effective strategic response to such changing conditions, is critical to success during the time-limited drift season.

3.2.7 The Drift Gillnet and its Use

Drift gillnets are usually in the range of 150 fathoms in length and 45 meshes or about 20 feet deep. A new net typically costs between $1,200 and $2,000 or more, depending on overall size, quality, number of floats, and so forth. Floats are positioned along a line on the top, and lead weights line the bottom. Mesh openings are designed to be just large enough to allow the male fish, which are usually larger than females, to get their heads stuck or "gilled" in the mesh. ADF&G (1999) provides a concise summary of drift gillnet operations in Alaska, with inherent similarities to all gill-netting:

> Gillnetters [set] curtain-like nets perpendicular to the direction in which the fish are traveling as they migrate along the coast toward their natal streams. Much larger fish and the smaller females are not so readily gilled. Gillnets work best in silty or turbid water which makes them difficult for the fish to see . . Gillnet vessels . . are easily recognized by the drum on either the front ("bow picker") or the stern ("stern picker"), on which the net is rolled. Net retrieval is by hydraulic power which turns the drum. Fish are removed from the net by hand "picking" them from the mesh as the net is reeled aboard . . Gillnet-caught salmon are usually iced and delivered to buyers and cold storages. Historically, their ultimate destination was the canned market, though a growing market for frozen product has developed overseas.

Figure 3-3 Drift Gillnet in Repair at Net Shop in Kasilof

The drift captain and crew typically target an area for fishing based on a combination of factors, including but not limited to: (a) present and predicted tide, weather, and sea conditions, (b) information gleaned from others fishing a specific zone on a previous day or tide during a given run, (c) previously accumulated knowledge of an area during specific times of the season or conditions, (d) the presence and activity of other vessels in a specific area, (e) purposefully communicated comments of friends, or overheard comments of others on the (VHF) radio about the location and/or behavior of fish, (e) the behavior of specific rip tide zones on a given time or tide, (f) visible signals indicative of the presence of fish such as logs, sticks, or other flotsam in the rips, numerous active birds, and jumping fish, and (g) regulatory factors. Again, rip tide areas are very often favored for setting a drift gillnet. Periods and places of extreme tidal flow are typically avoided for their dangers, but there are exceptions, and many experienced drifters focus on rips and other moderately hazardous areas during much of the season.

With one of the largest tidal ranges in the world,[13] current conditions change rapidly on Cook Inlet. The interaction of changing water volume with subsurface topographic features has a dramatic effect on the nature of currents and rips. An area that is relatively calm in ebb or maximum flood stages can become a torrent within a quarter change in the tide. Experienced drift gillnet fishery participants are very keen in their knowledge of tidal flow and how it affects surface and columnar water conditions and salmon behavior in specific areas. This knowledge and associated navigational and fishing strategies are essential aspects of the fishery.

Knowledge and ability to judge weather, wind, and wave conditions are also important. The destabilizing nature of choppy surface conditions can complicate the drift fishing process. Very high winds are not uncommon in the area and many captains avoid problems through careful monitoring of the weather band on the radio, the clouds, sky patterns over the mountains, and subtle clues of impending problems detected on distant waters by experienced eyes. Some winds, such as the strong southwesterly, are positive in that they can bring favorable currents and fish closer to the eastern side of the Inlet.

Knowledge of the resource, local conditions, and associated fishing strategies vary widely. There are tendencies to fish the tide-changes, and to focus on specific rips at certain lunar phases. But there are no hard and fast rules, and some captains avoid the challenging conditions around the rips. Moreover, for many participants, the demands of family and other forms of employment often impose more influence on when and where one can fish and for how long than do optimal conditions for fishing. On the other hand, many other participants arrange their lives around the drift season and make sure they are available to fish what they deem to be the best times, tides, rips, and other conditions.

3.2.8 The Process of Drift Gillnet Fishing

There are three primary rip zones of focused interest to drift gillnet fishery participants active in the region: the east, middle, and west rips. These span the eastern and central portions of Cook Inlet. Intermediate rip zones and more westerly rips are also areas of activity, though the westerly rips are more distant and so less popular. The fleet focuses extensively on the east and

[13] Cook Inlet high tides reach 39 feet and even higher at full and new moon phases during certain times of year.

mid-channel rips, but again, variability is common, and some owner-captains have invested in vessels that can reach distant locations fairly easily, while others operate relatively small vessels with more limited fuel capacity and range.

Some participants rely on information of others to inform their fishing strategies. As described further along in this section, many are consistently involved in radio groups in which information about movement of salmon and other important information is regularly transferred. Other persons assume a less social strategy and power out from the harbor straight to the edge of the middle rip, look around at the water, and drop their net if there are more than a few salmon breaking the water – "jumpers." Of course, seasoned fishermen hold knowledge that beginners are only developing, knowledge of favorite spots, special techniques, and a cultivated feel for where salmon are most likely to be given the date and patterns of salmon migration in years past, prior progress of the current run, wind direction, tide, and current.

Once an area is determined to hold some promise for high yield of salmon, the captain will direct and/or participate with the crew (or in some cases act alone) to lay out the net by releasing it from the hydraulically-operated rolling drum or reel. Operators of vessels with a stern-fed net (common) will typically idle or slowly motor bow-first into and across the current to facilitate the smooth unraveling of the net in and across the flowing water column. A bow-picker (relatively rare) will do the reverse. The vessel then accompanies and monitors the net as it floats in the rip or other target area, hopefully entangling fish as it goes. Occasionaly, as when the vessel is approaching the corridor boundary, or if the captain wants to "test" an area, only part of the length of net is released, ensuring more rapid retrieval.

There is often much worry about the movement of the net in the water as it is not unusual for it to ball up, twist, bend, or otherwise contort in a way that minimizes the surface area of mesh available to gill the fish. There is often extensive and strategic towing and tugging of the net to coax it to float in optimal fashion after it is set.

Minimal and even moderate action of fish in the target area can be hard to detect depending on the degree of chop on the surface, the position of the sun, and level of turbidity. In such cases it can take good judgment on the part of the captain to determine when the net has reached its maximum likely harvest in an area and thus when to start pulling it in. Sometimes a captain will insert a net in a rip and stand back from it a bit. But the net is rarely too distant and typically remains connected by line and buoy. If detached, the captain and crew will track the buoy and retrieve it with gaff when ready. When the fishing action is vigorous, the net naturally fills quickly and rapidly assumes a characteristic "V" shape, with numerous fish visibly breaking the surface as they crowd and splash against its sides. Length of set thus varies widely depending on the presence or absence of fish and the strategic success of the harvesters.

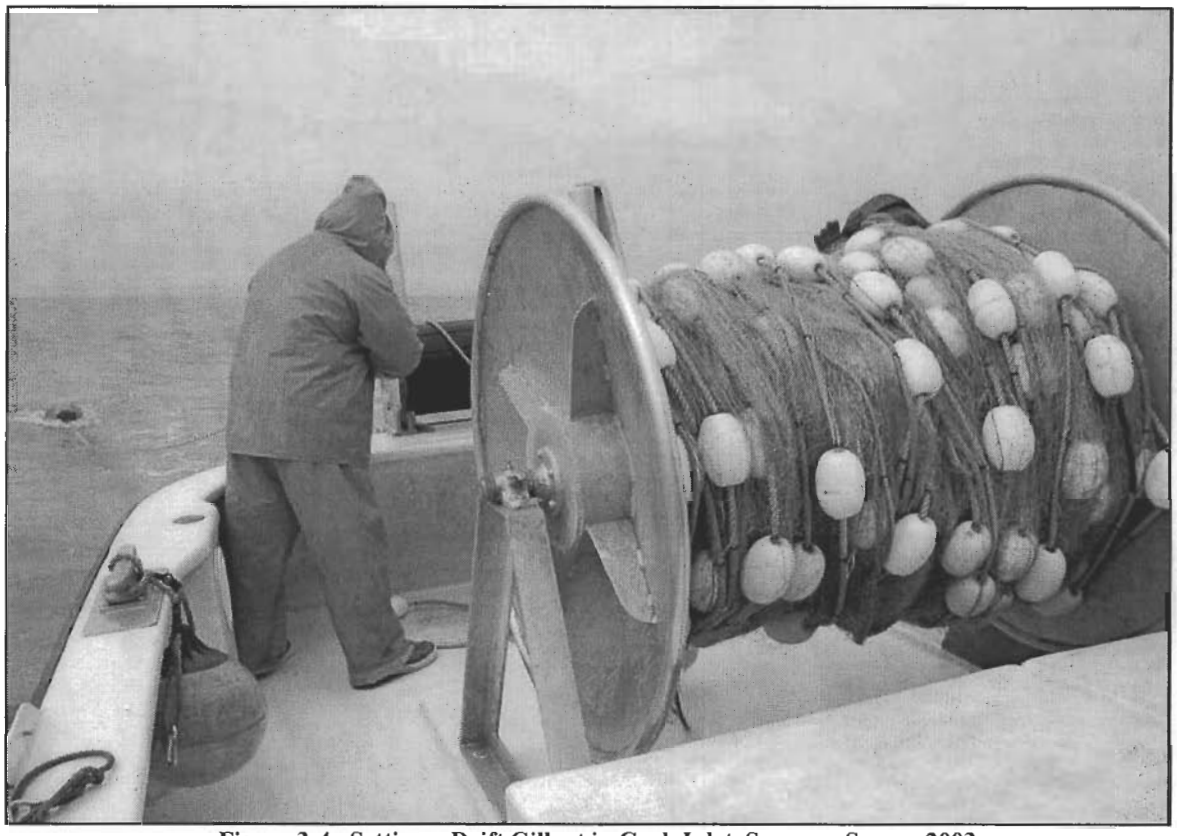


Figure 3-4 Setting a Drift Gillnet in Cook Inlet, Summer Season 2003

Net retrieval time also varies widely. A full net naturally takes longer to retrieve and pick than one that is only partially full. Picking is a physically demanding process, and despite the excitement of incoming fish, some attention need always be paid to the water and potential navigational hazards ahead. Given the physical nature of picking, total retrieval time varies with the skill and stamina of the pickers. Since an unsteady platform can slow the operation, surface conditions are also an important factor. Informants suggest that two strong pickers can average 500 fish per hour in favorable conditions, and that an excellent set can yield on the order of 700 to 800 fish. One of our core informants reported a career high set of 1,200 fish.

As the net is reeled in, fish are shaken free of their gills, their own weight serving dislodge them. The "picker" sometimes has to dig his or her middle finger under the gills to catch the net line and pull it around the gill while shaking to release the fish. The salmon are placed in covered storage. Once the net is back on the drum, the captain seeks a new location while the deckhand finishes tossing the fish in the hold. Processors have begun encouraging ice to deliver a better product and in keeping with new (HACCP) processing regulations. One regional processor pays an additional five cents per pound for iced fish, while another requires icing and provides its fishermen with ice. If the boat is set up for icing, the deckhand will shovel some ice on the fish in the hold after each set.

After steaming home at the end of the day, night, or other defined fishing period, boats may have to "line-up" for unloading at the processor. This can take several hours. Boats tie up to their own

buoy and sometimes "raft" or tie up alongside three or four other vessels to wait. Casual socializing and comparison of catch and locations is common. Unloading can be done remotely, by skiff, or in the case of large loads, directly on the dock. Some operators load their catch into brailer (storage and transfer) bags. These can be transferred by crane onto the dock. Otherwise fish are unloaded by hand. This is time-consuming. A large catch can take in excess of an hour to unload. Local teenagers are sometimes paid a nominal amount to climb into the hold to throw fish out into boxes or totes. Ice is shoveled into the bottom before loading and on top of the fish. Each tote is taken up the dock to be weighed and its sides cleaned. The boat is then moored at buoy and cleaned. Finally, a cannery skiff takes the crew ashore. Checks are usually distributed by the buyer/processors some weeks later based on average market values at the time of sale, with additional monies disbursed if and when prices improve.

Table 3-2 Summary Description of Important Aspects of the Drift Gillnet Operation

Factor	Quantitative and Qualitative Description
Length of net	150 fathoms or 900 in length by about three shackles or 20 feet in depth
Speed of net retrieval	Ranges considerably depending especially on volume of salmon in net. Empty net 15-20 minutes with full power hydraulics (best case), net full of fish and pieces of flotsam can take up to four hours to retrieve and pick (worst case)
Distance of drift per set	Ranges considerably based on current speed, presence of fish, and other factors. Key informants report a range of never less than a mile, as much as 15 miles
Distance from east shore	Varies extensively based on strategy, corridor openings, size of vessel, fuel and economic considerations, word of fish further out
Harvest lost due to mistakes	Varies extensively based on skill of participant; hard to quantify
Time and harvest lost in event of various entanglements	Entanglements are more frequent in rips and can slow the operation extensively. But fish and sticks in the net can be concurrent. Observation suggests a loss of 10 minutes for every 100 sticks; given gilling effect, loss of harvest minimal
Frequency, magnitude of navigational corrections due to traffic or obstruction	Informants report the number of corrections naturally varies based on level of traffic and number of obstacles; observation suggests such corrections are made a few times each trip, but that corrections due to traffic are less frequent as one navigates and fishes further west; obstructions such as logs are a constant possibility no matter the area
Frequency of return to a target location	Varies depending on strategy, skipper preferences, and vessel speed. Regarding the latter, captains of fast boats often abandon a non-productive spot and move to other favored zones more readily than a slower vessel, captains of which tend to frequent known-as-productive areas in fewer regions.
Perceived risk associated with collisions	Tanker interactions most feared, frequency of occurrence depending on tendency to fish in shipping lanes, hard to quantify but frequently mentioned among key informants
Frequency and duration of radio conversations	Length and frequency vary depending on type of social relation (friend, radio group member, relative stranger) and urgency of need for information. But communication is frequent and extensive for many (10 to 25 per trip), and short (1 to 5 minutes) during busy periods, longer while steaming or idling
Distances maintained between vessels	Vessels sometimes touch along the corridor line; interaction with other's nets and lines stringently and universally avoided
Weather/sea and traffic effects on operation	Weather and seas can slow steaming speed by many knotS, especially for smaller vessels
Distance maintained between net and vessel during drift	Varies depending on current speed, and strategic placement in a rip while avoiding the rip with the vessel, but always within sight, frequently within 50 yards, often within 10 yards
Average duration of sets	Varies extensively depending on conditions (see speed of retrieval above); observation suggests a normative range of 15 to 20 minutes until an empty net determines a new set or strategy

3.2.9 Challenges and Rewards

Drift gillnet fishing in Cook Inlet is uniquely challenging for the many reasons described above. Becoming an accomplished drifter in this environment requires accumulation of experience and knowledge. Once skills are gained, one is often willing to range further and take bigger risks. Success, in turn, brings greater confidence. Transcending the challenges and bringing reds to port brings money, social status, and numerous subjectively experienced rewards. Regarding the latter, drift gillnetters tend to truly enjoy their work on the Inlet and also what it brings them besides economic return: independence from a boss, the hands-on acquisition of a product, meeting physical challenges, and being on the ocean.

Patrick Dixon provides a colorful description of drift fishing in *Running Against the Tide, an Oral History of Commercial Fishing in Cook Inlet, Alaska* (1999). The author's actual account of two captains meeting the physical challenges of drift gillnetting on Cook Inlet in the mid-1990s is particularly relevant to the present research. It is reprinted here in abridged form with permission from the author. The fishermen work in a truly challenging setting with awareness of each other and a readiness to assist. The dangers can be immediate and compelling, even without other vessels or obstructions downstream. But the bounds of safety are pushed to the limit as getting fish to port is the prime objective:

> The waves were huge . . The [drift gillnet vessel] would shudder as the force of a wave would smack into the stern. Fishing alone was one thing. Fishing alone under these conditions was something else entirely. He [Gordon] had already tried picking up the gear once, but when he tried to pull the boat backwards into the waves they crashed into the stern with such ferocity that he was nearly knocked down. The back deck filled with enough water to be over the top of his boots. Realizing his predicament was getting serious, he reeled the lines back over the stern and returned to the cabin to call his friend Herman on the marine radio.
>
> Finally, over the tops of the waves, Gordon spotted a light. Herman's big boat approached slowly, and the two skippers came out on deck as Herman's son steered the boat into the waves alongside . .
>
> [Herman] looked at the net riding behind Gordon's boat. Even in the gathering darkness it was possible to see the hundreds of fish hanging in the net between the waves. Gordon had a big load in that net. It'd be a crying shame to cut it loose and run for cover. "Tell you what," [Herman] yelled . . "You cut loose and head for the north end, and we'll pick it up for you!"
>
> ". . things had gotten worse. The seas weren't calming, and the wind was blowing harder still. The net was absolutely plugged with fish, which made the job of picking harder that it would have been with a moderate set. The extra weight pulled at the stern . . and so many waves were breaking over the stern and crashing into the picking cockpit with them that he ordered his son to get some line and tie themselves to the boat. He didn't want to have to attempt a man-overboard rescue under these conditions. It was now completely dark, and they were picking by the dim illumination of the small electric light . . on the

> back deck . . Herman was determined to meet this challenge head on. He would get all of Gordon's fish back for him and that was that.
>
> By dawn, Gordon was beginning to think the worst. No radio call had come, and the winds, though calming some, were still churning up the distant part of the Inlet he could see. As he scanned the horizon, he spotted spray in the distance. A boat? He went to the radio expecting no response and picked up the microphone. When Herman's voice boomed back . . "How 'ya doin' there, Gordon?," Gordon snorted a laugh. He wasn't concerned for his fish, all of which Herman had retrieved and eventually delivered . . in Gordon's name. He was just glad his friend had survived. Herman, for his part, would take no compensation for his efforts other than his own sense of accomplishment and the satisfaction of helping a friend. Considering the odds he had overcome, that payment was indeed high (Dixon 1999).

3.2.10 Social Organization and Communication on the Inlet

"Radio groups" are an important part of the Cook Inlet drift gillnet fishery. These usually develop informally over time as participants interacting as family or friends on land or at sea become amenable to conversing with each other by radio about fishing and weather conditions on the Inlet. Once developed, further growth of the group is usually limited to invitation. Norms demand that the core subject of most radio conversations - presence of salmon in a given location - remains secretive; that is, limited to within the group. Some even modify their radios to include special channels difficult to receive by others hoping to listen in and benefit from the revealed accumulated knowledge and experience of the group.

Although various underwater features and areas can yield salmon, as noted above, most drifters consider the rip zones to be highly productive. For many, the middle rip is considered the best place to fish. Because the rips zones shift constantly with changes in tide, rip locations and the nature of conditions in and around the rips are frequent subjects of conversation. General information about the progress of a run as a whole is communicated widely in and across Kenai Peninsula communities, and as such is not necessarily the confidential information of radio groups.

While a large part of the outcome of any given day of fishing is luck, the most common way of increasing the odds of finding large concentrations of sockeye salmon is to work with a radio group. Most range in size from two or three to sometimes as many as 20 persons. Most fishermen will say that in terms of gathering information to catch fish, the bigger the radio group the better. But most also agree that groups today are smaller than in the past, mostly because old members are dying or getting out of the fishery. The largest group IAI researchers encountered numbered 22 captains, but most involved between about five and eight members.

Drift gillnet fishery participants often begin communicating to their radio group even before leaving their place of mooring, chatting as they drink a cup of coffee. Each captain decides where to go first based on a combination of factors, including information gleaned from others in the group. A variety of starting locations across the group increases the breadth of the sample of first sets. Each participant usually tells the others how many jumpers are seen at each of potential set. If there are numerous jumping fish at any given location, the participant will tell the group, then set and watch the net for a while, waiting to see the telltale signs of salmon. Then it's back on the radio to communicate the outcome. If there is significant action and other members of the group are not experiencing equivalent success, location will be verified and others will begin heading toward potential success. In this way, individual success can be transformed into collective success.

The radio group functions also serves as means for entertainment during long sets and equally long 'drives' in search of jumpers. Participants are quite often seen holding handset to mouth - talking, laughing, offering advice, complaining, and philosophizing. The groups are patently social and cooperative in nature, and facilitate trading of technical expertise, tools, and even gear and vessel parts, both at sea and in harbor.

The groups facilitate social connections on land as well. Fellow members of radio groups often share spare time both during the season and in the winter months. This aspect of the relationship can be especially important for participants from other parts of Alaska or other states who are usually isolated from their families during the summer season.

Finally, radio groups significantly enhance communication about hazards and problems among other drift gillnet vessels operating on the Inlet. In days past, drift gillnetters often relied on cannery-operated tenders to tow them back to harbor in the event of mechanical or other problems. Today, one typically reports problems to fellow radio group members before turning to other means of assistance. The closest or fastest vessel in the group will usually respond first. This is not to suggest that assistance is limited to within radio groups only. Information about vessels in trouble travels quickly across the Inlet since a range of VHF channels are monitored, especially mainstream channels reserved for such information. Moreover, experienced participants can often readily spot potential trouble and actual trouble in its early stages. Such seasoned veterans tend to "keep an eye on things," and their communications are critical to safety among drift vessels operating on Cook Inlet.

Figure 3-5 Prime Objective: Fish in the Hold

3.2.11 Local and "Outside" Participants

There are notable differences between drift gillnetters who live on the Kenai Peninsula, and participants from other states who typically come to the area only during the fishing season. The colloquial term used in Alaska for the other 49 states is "down south," or "Outside."

While many states are represented in the drift gillnet fishery, the vast majority of seasonal fishers reside in Washington and Oregon during most of the year. Some of these participants also work in the Columbia River commercial salmon fisheries. There is general agreement that fishermen from the Columbia River area actually pioneered the drift gillnet fishery in Cook Inlet. Elderly Outside participants appear to outnumber elderly local participants. The study team interacted with only two or three local participants with 50 years experience, but with numerous Outside participants who had been fishing for more than 50 seasons. Over the last several decades, the number of local fishermen has grown steadily, and the two groups are now fairly even in number.

An important difference between the groups is that out-of-state participants are not as deeply involved in the local politics of the fishery. While many are very active in the politics of the Columbia River fishery, many are in the Cook Inlet area for only a month or two every year, and therefore don't have ready opportunity to participate in local or regional politics. Therefore, although many Outside drift gillnetters are members of UCIDA, few are active in the off-season.

An even more significant difference between the two populations is their respective forms of social-familial interaction during the season. Many local fishermen live with their families or in some reasonable proximity to friends. For many Kenai Peninsula fishermen, nights are spent eating home-cooked meals, interacting with wives and children, and otherwise spending time around the house and shop, often preparing for the next fishing trip.

Outside gillnetters, on the other hand, are often far from home. They spend the drift season without family and hometown-friends. Virtually all out-of-state fishermen spend the season living in cramped trailers on the grounds of their avowed buyer-processor, often two to a trailer. That said, the spirit of camaraderie in the processor trailer-parks is palpable. Many of the fishermen have been coming to the same site for upwards of three decades, and laughing, arguing, and talking story with the same friends for as long as they can remember. There is a camp-like aspect to the trailer-parks, and many fishermen joke about how good it is to "get away from the wife for a while." On weekends and non-openings, out-of-state fishermen are often seen working on their boats, talking or playing cards with friends, or perhaps watching TV with other fishermen in the local lounge.

One result of inter-group differences in social and familial arrangements is that there is little interaction between the groups on land. But things are different on the water. Radio groups almost always include both Outside and local participants, and both groups assert that interrelations on the water are very good. So while there are differences in local political participation and social behavior, on the water the distinctions are generally unimportant. The current level of limited interaction between local and Outside participants may be accentuated by the fact that processors are increasingly less involved in the social lives of the fleets. Many out-of-state and local participants talked about days past when canneries like Ward's Cove provided breakfast and other meals to the fishermen, held cribbage tournaments, and generally were more directly involved in their lives. Some complain that what processors really care about these days is merely "the bottom line" – prices and profits.

3.2.12 The Russian Old Believer Fleet

The Russian Old Believer communities of Kachemak Bay include three distinct settlements located near Homer and Anchor Point. Settled in 1967, Nikolaevsk was the first of the Russian Old Believer villages to be established in Alaska. Most residents emigrated from Oregon and and are descendants of dissident Christians who split from the Russian Orthodox Church in the 17th century. Typically, Old Believers lead a family-oriented, self-sufficient lifestyle that includes gardening, raising small livestock, fishing, and hunting. Traditional clothing is worn by many, Russian is the first language, and church rules require that males do not shave.

Today, most of Kenai Peninsula's Old Believers are employed in the Anchor Point and Homer areas, primarily in commercial fishing and construction. Commercial fishing activities include spring and fall halibut fishing, summer salmon fishing including drift gillnet fishing, and cod fishing in January. Many of the younger residents are getting out of fishing and choosing to relocate to Anchorage to work in the construction trades. Most such persons report that poor market conditions in the seafood industry have led them to change careers.

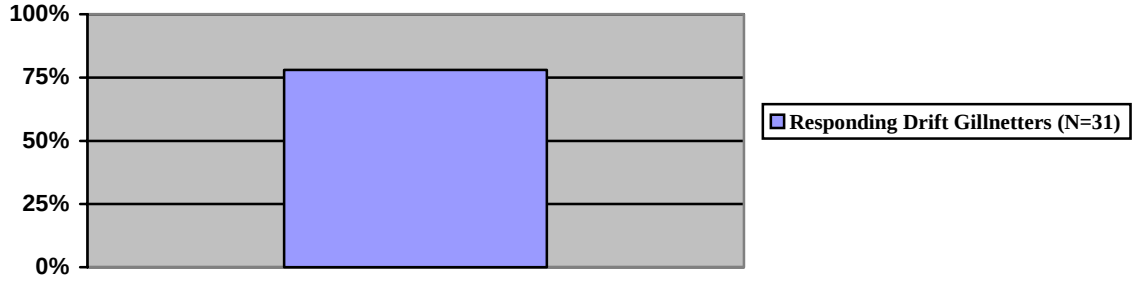
The Russian fleet primarily fishes from the Ninilchik boat harbor. Although some captains in this group fish from Homer early in the season and after July 15, a number of captains will steam or trailer their vessels north to fish from Kasilof. Generally speaking, these participants prefer to fish the middle and east rips. Old Believers are known for their top-quality boats and have a reputation for fishing hard and fearlessly. Readers are referred to Dolitsky (1998) for an account of the history of this small, adaptive Alaska society.

3.2.13 Fishing and other Work

Many participants believe that decline in profitability of the Cook Inlet drift gillnet fishery is like that of other industries across America in which independent producers struggle to break even under globalizing markets, the conditions of which provide little return on the dollar. Interestingly, some report that the initial compensatory payouts from the *Exxon Valdez* spill have enabled ongoing maintenance of gear, vessels, and engines and in some cases even allowed operational upgrade.

But with regard to the fishery itself, most participants say that return on operational investment from all sources is minimal, and operating in the red is not uncommon. Though some drifters also fish in other areas and fisheries, increasingly fewer drift gillnetters make their entire living from fishing. As noted in Chart 3-2 below, still fewer earn all of their income solely from the drift gillnet fishery. Some 77 percent of the seasoned fishermen participating in our protocol-guided interviews reported working non-fishing related jobs during the bulk of the year. Thus, the drift fishing enterprise is largely a side-line to full or part-time work in other fields.

Chart 3-2 Drift Gillnetters Holding Alternative and Secondary Employment



Negotiating other forms of employment with drift gillnet fishing can be difficult, but for many it is the enjoyment of the act of fishing as much as the return on investment that is motivating. The enthusiasm of many participants to persist despite meager return on investment that characterizes modern drift gillnet operations, has to be explained by non-monetary factors. These include enjoyment of the hunt and the marine environment, freedom at sea, and participating in a respected activity in challenging conditions.

3.2.14 Small Fishing Vessel Economics and the Market

In the typical fashion of quick calculation during an interview with a fisherman, one participant estimated his gross revenue from drift fishing the previous season was about $20,000. But he went on to report the costs:

> "$3,000 to 4,000 for groceries, $3,000 to 4,000 for maintenance, $1,500 to 2,000 for gas . . then there's fees – two percent aquaculture tax, one percent to the Alaska Marketing Association [pause], and then the deckhands . . Last year my [two] deckhands made more than myself. I paid them a thousand bucks. Should have paid them seven or eight hundred, but I just couldn't do that to them. You figure it out. I barely made a profit at all."

Another permit holder estimated his annual drift gillnet profits had dropped from $50,000 in the early 1990s to $2,000 to $3,000 over the last couple of years.[14] These figures are rough estimates provided during interviews, but their validity is strengthened in that many drift gillnetters working in the region offer similar assessments. Moreover, the figures are similar to those generated through a survey of drift gillnet salmon fishery participants in Bristol Bay. Bristol Bay drift fishery participants also struggle economically. Carlson (2002:25) reports that the mean net operating income[15] for her sample of local rural drift gillnetters in the Bristol Bay fishery was $1,169 (N=40). At $6,936, mean net income for non-residents (N=148) was significantly higher, but not highly significant relative to years past.

As one Cook Inlet fisherman noted with an air of prophesy, "a young guy would be foolish to get into this fishery now." Indeed, apart from youthful deckhands, there are but a few unwrinkled faces visible in the Cook Inlet drift gillnet fleet.

Several factors appear to underlay the precipitous decline in salmon prices that began in Alaska in the early 1990s. The deflation of the Japanese yen had a profound effect on the price of salmon. While lively Japanese markets kept sockeye salmon prices high even into the early 1990s, and led to extensive capitalization in the short-term, the situation also bred over-reliance on a single market. Local processors failed to fully develop connections with the domestic and alternative foreign markets. In light of changes in Japanese consumption patterns amidst the failing Japanese economy in the late 1990s, many fishermen and processors recognized the need to market fresh-frozen fish to consumers in the rest of the nation.

Some perceive pen-reared or "farmed" salmon as presenting a serious threat to the drift gillnet fishery. This was a common topic of conversation with informants. Drift gillnetters review a long list of perceptions about farmed fish: disease and its potential spread to wild populations, extensive use of steroids for growth, use of antibiotics to fight disease, red dye to simulate the

[14] Informants rarely included an estimate of the full value of labor in their cost estimates, and thus profit estimates are typically inflated.

[15] Net operating income is defined here as gross earnings minus crew shares, transportation, food, fuel, maintenance, nets, miscellaneous gear, insurance, moorage/haulout, property tax, raw fish tax, vessel and permit license fees, and administrative services (Carlson 2002:25).

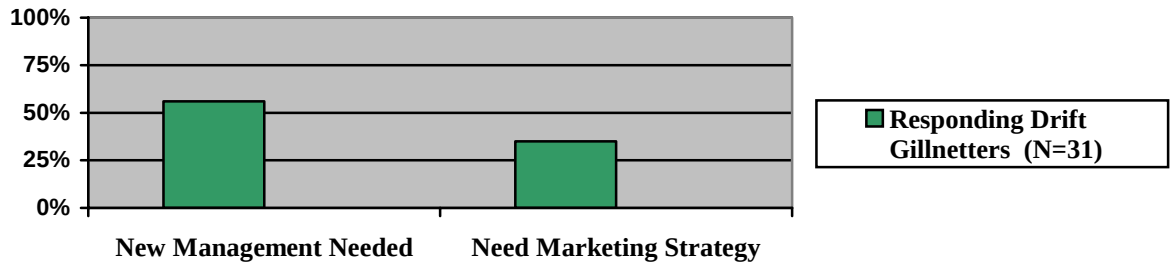
color that fresh fish acquire through krill consumption, and the effect of farm effluent on water quality in surrounding waters. The desire to inform consumers about the ostensible risks clearly relates to the perceived effects that farmed fish have had on the demand for and price of fresh fish from Alaska. Some informants believe that recent popular news stories about problems with pen-reared salmon may eventually benefit those who harvest and market "wild" Alaska seafood.

Persons in all quarters agree that price is the single biggest challenge confronting participants in the Cook Inlet drift gillnet fleet. Prices paid by processors for reds have fallen from as high as $3.00 per pound to as low as 50 cents per pound in a little over a decade. Based on interview data, profits earned by individual participants have in many instances fallen by as much as 90 percent. Permit and boat values have likewise plummeted. In many cases, participants no longer generate or can hope to generate enough revenue to purchase new vessels or refurbish old ones.

While a thorough economic assessment of market issues for drift gillnetters is outside the scope of the current project, it is clear and significant that the market issue is one of the two most salient current issues for Cook Inlet drift gillnet operators. The other highly salient issue is the region's resource management regime. Many drift gillnetters report dislike for what they say is a trend of increasing control of Cook Inlet salmon resources based on political rather than biological and ecological factors.

As noted in Chart 3-3 below, of the 31 seasoned fishermen who participated in our protocol-driven interviews and offered perspectives on important factors affecting their operations, more than half (55%) mentioned a need for improved management. This issue is discussed in further detail in sub-section 3.6.18 below. Meanwhile, some 35 percent also discussed market problems and potential solutions such as marketing Cook Inlet salmon as a "wild" Alaska product. While numerous other issues were discussed, these two were foremost for the interviewees.

Chart 3-3 Salient Issues for Seasoned Drift Gillnetters



Fishery issues associated with oil and gas industry activities in the region are, in the reported perceptions of our informants, largely peripheral and currently secondary to management and market issues. In fact, informants were typically eager to move interview discussions away from oil development and back to prices and politics. The specter of a future oil spill in the Inlet, and experiences with the *Glacier Bay* and *Exxon Valdez* oil spills, are exceptional to this tendency, and many informants spoke extensively on such matters. But these conversations were the result of direct questioning about oil and gas issues. General queries about the most salient issues for

the fishermen led to discussion about the most cogent issues of the day – fisheries management and market conditions.

3.2.15 The Contemporary Labor Environment

The average drift gillnetter is an independent small business operator with limited political involvement or power to change the market conditions within which he operates. The focus is on preparing to fish and fishing during the season, and engaging in other fisheries and/or forms of employment during the rest of the year. Prices are determined not by the harvester but "top-down" by buyers on the distribution end. In the absence of truly creative or proactive solutions to marketing, the harvesters will continue to merely react to pricing issues.

Salmon prices are virtually always within five or 10 cents per pound no matter the buyer-processor. Thus, changing buyers is not normally a rational option for bettering one's profit margin since foregoing allegiance to a specific buyer-processor can in many cases be detrimental in the long-run. For instance, lacking sufficient space at home, or means for conveying large vessels, many operators depend on the buyer-processor for vessel storage. This is especially true of drift gillnetters from other states. Buyer-processors allow rent-free storage so long as the captain in question agrees (tacitly) to stay loyal the following season. A change would be likely to force retroactive payment of rent. Moreover, some processors pay five cents per pound as a bonus at the beginning of the current season for total catch landed the previous year. With current fish prices at 50 to 55 cents per pound, forgoing this bonus could result in a 10 percent loss in fishery-specific income.

3.2.16 Decline of Profits for Regional Processors and Support Sectors

The often-difficult position of drift gillnetters does not necessarily imply that processors are in a correspondingly advantageous position. The market economics of the fishery are complex at all levels and for all sectors. As for numerous harvesters, many processors have pulled out of the industry or scaled back significantly in the face of fiscal challenges. For example, of the four processing plants formerly owned and operated by a certain corporation, two have been sold, and a third is nominally operational but in actuality off-line. Only one facility is currently operational. Another processor also awaits better times - its single year-round employee is its owner and president. Likewise, when Icicle's processing plant in Homer burnt down several years ago, the firm's president reported he would love to rebuild the plant. But without a stable, guaranteed season, he couldn't take the risk until and unless the situation improved.

Most of the ancillary jobs the salmon fisheries in Cook Inlet once provided have either disappeared or have been replaced by lower-paying equivalents. As several informants pointed out, many Kenai Peninsula residents once envisioned commercial fishing and processing as career paths. Today, even office and other corporate staff positions in the industry are seasonal. College students looking for lucrative summer jobs have disappeared from the docks. The high-paying jobs that brought them to this line of work – deckhand work, or throwing, hauling,

cleaning, gutting, and packing fish – remain as seasonal options, but now also draw local students who can work for lower wages.

Much of the drift gillnet support sector has gone out of business. One Kenai-area informant noted that numerous local businesses that used to support the fleet have closed down. In the booming years at the turn of the 80s, re-powering, repairing, rebuilding, and building new boats were major local industries and fueled growth in indirectly-related sectors throughout the Kenai Peninsula. The more optimistic processors and fishery participants treat the present slump as a temporary downturn or as a stimulant to more streamlined approaches to production. But the general outlook as reported by our informants is patently gloomy.

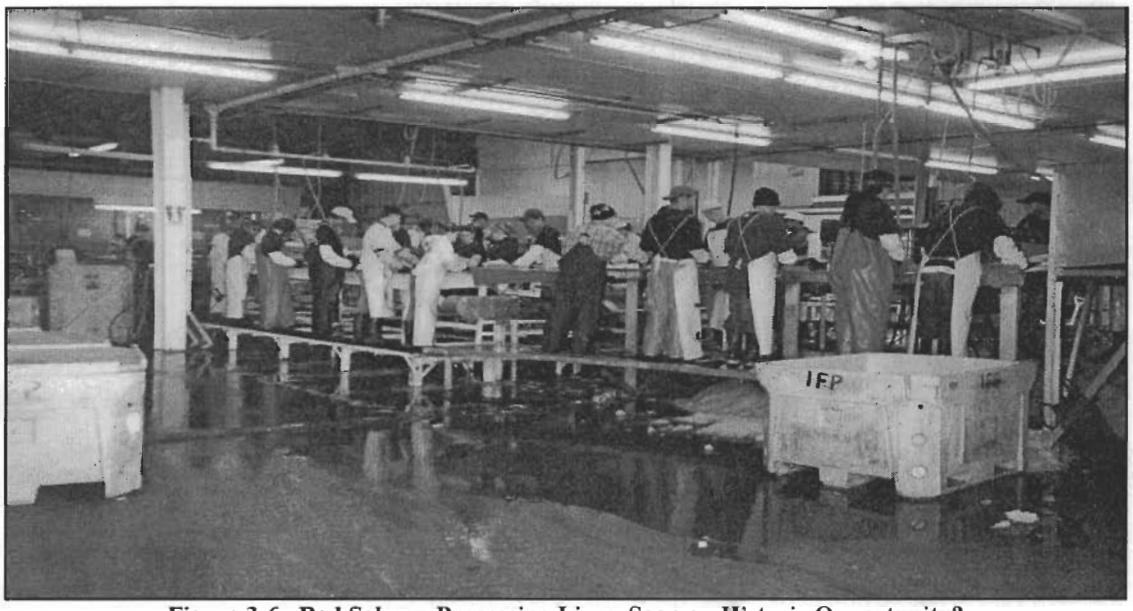


Figure 3-6 Red Salmon Processing Line: Soon an Historic Opportunity?

3.2.17 An Aging Fleet

Inadequate revenue obviously makes it difficult to maintain drift boats, much less re-power or otherwise improve them. Duct taped lines and joints are common. Jury-rigged safety pedals start and stop hydraulic reels. Old gaskets are retrieved and recycled. The fleet as a whole is now under-capitalized. New boats are often looked upon with a mixture of envy (naturally) and pity (because payments are difficult to make with revenues so low). Furthermore, while revenues from the salmon harvest have plummeted, the costs of parts and labor have grown steadily over the last decade. Many participants are often unable to absorb the cost of even relatively minor mechanical mishaps, which means that they are always a water pump, carburetor, or head gasket away from the end of a fishing season. This is especially true for Outside participants, many of whom are separated from familial support networks and are dependent on retirement benefits to supplement or pay for their fishing. Once again, there is variation, and there are exceptions. Some heavily capitalized drift vessels also ply Cook Inlet.

3.2.18 Demise of Cash Buyers

During the height of the fishery in the 80s, cash buyers were plentiful in the Cook Inlet region. These were usually marginally capitalized "middle-men" who made arrangements to transport salmon from Cook Inlet for re-sale at markets in the lower-48. One informant reports that there were "fifteen [such buyers] at any given time [in the region]." The presence of cash buyers typically increased the pay-out price for sockeye salmon since processors would in turn have to increase payments to prevent losing product to the said buyers. Current market conditions and countermeasures developed by the processors now preclude such activity, with seemingly positive effects for the processors and negative effects for the harvesters. Processors learned to temporarily raise payments until the cash buyer had left, when they would quickly drop them. This, coupled with contemporary market prices and the payment of loyalty bonuses at the end of the season, effectively ended cash buying.

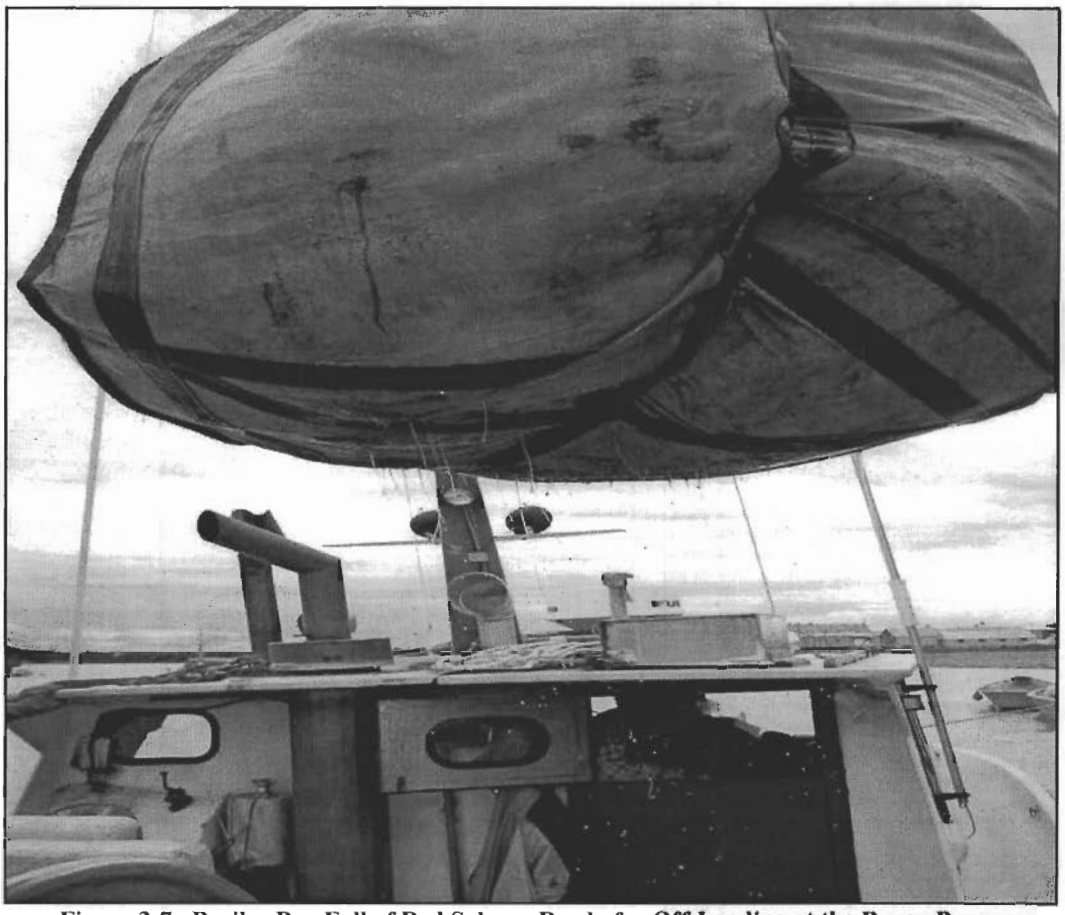


Figure 3-7 Brailer Bag Full of Red Salmon Ready for Off-Loading at the Buyer-Processor

3.2.19 Regulatory Regime

Regulatory measures established to manage a complex set of resources can present various challenges to harvesters, not the least of which is remaining informed of rules and "regs." The most basic limitation to activity is that drift gillnet fishing is allowable across the entire district only on Mondays and Thursdays from 7:00 a.m. to 7:00 p.m. The situation is now obviously vastly different from years past when drift gillnetting could legally occur any day, time, or month. This basic limitation drives the timing strategies of the entire fleet. Many captains work part-time in the summer and therefore make work arrangements, family arrangements, and arrange for crew to work on the vessel based on these allowable times. Much has to be readied for a drift trip – vessel and engine maintenance and checks, fueling, gear preparations, purchase of ice, and so forth – and everything has to be timed around the days of the week when fishing is allowed.

While weather conditions can and do preclude planned trips, periodic emergency closures and discretionary emergency openings make participation in the fishery particularly unpredictable. The drift gillnet fishery is managed by means of a three-year plan that can allow some prior planning for participants, but in recent times the Board of Fish has significantly reworked the plan each year. Field researchers involved in this project were able to witness first-hand the challenges many fishermen encounter in attempting to interpret the nautical and temporal parameters of emergency openings. Many operators worry about enforcement and fines amidst uncertainty of regulations, and many earn only marginal profits and so have reduced capacity to absorb the costs of fines. The result of this situation is that many participants will not fish as avidly as they might, or will end up fishing with many others in relatively confined areas. One key informant summed up his frustration thus:

> "Before, it was hard work, but fun. Now it's stressful, staring at electronics all day, trying not to cross imaginary lines, [being] put into an area where you know the fish aren't . . . you spend the day staring at equipment so you don't violate the law, terrified of getting a citation."

A recent UCIDA survey indicated that nearly 75 percent of Cook Inlet drift gillnet participants are between the ages of 50 and 75, and that a similar percentage of drift gillnetters have over 25 years of experience in the fishery. While this experience may enhance efficient pursuit and harvest of salmon, it also means that most participants today have been through literally dozens of shifts in regulatory policy and may have trouble keeping track of changes, and/or maintaining avid interest in keeping track of such changes, and which policies currently apply. Many participants try to adhere to the regulations, but sometimes fail, as described by a Kasilof area fisherman:

> "What turned me off especially was getting stuck in the corridor. When we get stuck in the corridor everyone gets so cutthroat. I try to be honest about the fishing rules but I got picked up for going over the line. Our radio group decided to make it a point to not go over the line. We figured we could still try to be competitive without breaking the law. I got sloppy when I made a set. In a matter of minutes, I was over the line. I got 10 years probation. I sure was [angry]."

We reiterate that the biology and habitat ecology of Cook Inlet salmon fisheries are highly complex and that effective management is challenging. Many drifters nevertheless report that it is difficult to follow the many rules and regulations affecting the fishery. The regulatory scheme for year 2003 basic regulations is provided in Table 3-3 below to give the reviewer a sense of the basic regulatory variables that are typically subject to change and more detailed modification over the course of the season (see also Appendix C).

Table 3-3 Basic Regulatory Strategy for Cook Inlet Central District Drift Gillnet Fishery: 2003

Basic Regulation*
There will be one regular period restricted to the Kenai and Kasilof Sections between July 9 and July 15. This will either be on July 10 or July 14 in 2003.
Between July 16 and July 31 the department will restrict two consecutive drift gillnet periods to either or both of the following areas: (1) the Kenai and Kasilof Sections; and/or, (2) that portion of the Central District south of Kalgin Island. The area south of Kalgin Island may be used when necessary in runs when the Kenai sockeye salmon run strength is approaching 3 million or there are Kenai chinook salmon concerns which may prevent fishing by set gillnets in the Upper Sub-district.
If the sockeye salmon run is greater than three million and the department restricts the periods immediately before or on July 25 and after July 25 then the area in Figure 2 may be added to the other open area during these restricted periods
If the sockeye salmon run is greater than four million for the fishing period immediately after July 25, the entire Central District normally open to drifting may be open to fishing. If this occurs, only one regular period restriction from July 16 to July 31 may actually occur.
The season closes on August 9 so the last regular period is August 7 and there is no experimental pink salmon fishery after August 9 in odd years.
The latitude of the Anchor Point Light is now officially 59° 46.15'
* ADF&G notes that this summary is for informational purposes rather than a comprehensive review, and that full regulations are available in local area ADF&G offices. This information is available online at cf.adfg.state.ak.us/region2/finfish/salmon/uci/uciout03.php

Buyer-processor representatives often assert that the current regulatory regime makes marketing of salmon and maintaining adequate processing capacity more difficult than it would otherwise be. It is argued that the Cook Inlet stock is of itself highly dependable, but that the uncertain nature of openings and closures reduces steady and predictable supply of available seafood. This inconsistency is seen as partially causal in depressing prices and encouraging buyers to seek out more dependable sources. Moreover, given that production levels have been so seriously reduced in recent years, processors now lack the ability to accommodate very large catches that can occur with certain openings.

One processor recalled an enormous catch of 800,000 pounds during an emergency opening during a recent season. Since the plant was able to process only 200,000 pounds a day, extensive profit was lost. Given such situations, processors contacted during the course of this project asserted that if openings were more steady and dependable, so would be their ability to process and market the product.

Perhaps most relevant among regulatory issues is the common assertion among drift gillnetters that the current management regime leaves insufficient time and space for harvesting, and that because fishing time and place is increasingly restricted, openings tend to encourage extensive traffic and activity on the water. This has long been a criticism of derby-style fisheries in Alaska. Criticism of the situation is common among drift gillnetters, including a former president of UCIDA who assessed the relative importance of the problems encountered by participants active (that is, ideally more active) in the drift gillnet fishery:

> "It is a tie between access to fishing areas, regulations, and the market. The restrictions on time allowed to fish keep getting cut back. We can't afford to lose any more time or area."

3.2.20 Escapement and Cook Inlet Sport Fisheries

Drift gillnetters typically agree that political competition from the sport fishing industry is a threat to their livelihood. Many drifters believe that industry now exerts extensive influence because fishing-related tourism fuels the regional economy during the summer months, whereas commercial fishing has been unable to contribute as extensively as in years past.

The issue of salmon "escapement" is critical to understanding salmon fisheries in Alaska. The term refers to the number of fish that are allowed to swim to their spawning grounds (without being caught). ADF&G seeks to set escapement levels so that the various fisheries have the maximum possible number of fish available for harvesting, while also assuring that a sufficient number can return to spawn so that maximum harvest levels can be achieved in the future. This concept is called maximum sustainable yield (MSY). But the factors involved in determining the ideal figure for MSY are complex, and the numbers are perennially contested by a range of parties.

Many commercial harvesters and their representative tend to desire the lowest sustainable levels of escapement possible so as to allow for a greater harvest in the open waters of Cook Inlet. Meanwhile, sport anglers and their representatives tend to seek the highest sustainable levels of escapement, which puts more fish in the rivers. Actual levels of escapement over the past several years is said to attest to the lobbying success of the sport fishing community. Drift gillnetters assert that openings mandated by the Board of Fish prior to the season rather than by AF&G in response to actual emerging salmon counts have led to consistent *over*-escapement for four of the five Inlet river systems over the last several years. The issue is politically contested to be sure.

Most drift gillnetters consulted for the purposes of this research envision ideal escapement between 400,000 to 700,000 sockeye salmon per run. With runs of over a million, they argue, the salmon begin to deplete the upriver lakes of the zooplankton they need to survive and either starve or eat each other. ADF&G biologists agree, in theory, that over-escapement can cause and has in the past caused population declines. The exact number at which such population declines occur is a matter of some debate, but escapement for the last several years reportedly has exceed the technical maximum.

3.2.21 The Drift Gillnet-Halibut Charter Interface

While halibut and drift gillnet vessels do not compete for the same resource, they often operate in the same areas. Interactions between the two fleets are potentially dangerous in that the halibut boats often anchor to fish for the bottom-dwelling halibut, and thereby present a static obstacle for the drifting gillnet boat. As depicted on Map 3-1, our informants reported that most such interaction occurs in the southerly portions of the drift gillnet fishing grounds. Coast Guard personnel describe the interaction and associated dangers as a "gray area" of nautical law.

The first guided charter boat services in Cook Inlet were started in the late 1960s and for a decade less than a dozen or so operated in the region. There are now many scores of such vessels working from Deep Creek, Ninilchik, Kasilof, Kenai, Anchor Point, and Homer. Charter captains search the Inlet for halibut holes, and occasionally anchor when conditions warrant. Captains of moving drift gillnet boats are often unable to determine if such vessels are other drift boats or charter boats, or whether they are anchored or also moving. It is sometimes too late to respond in time to avoid affecting either operation.

Problem interactions between the drift vessel and the halibut charter vessel provide some insight into challenges potentially associated with emplacement of a drilling platform in areas of known drift gillnet fleet activity on the OCS. Reeling in a gillnet is time consuming, requiring at least 15 minutes even for an empty net. Quick evasive action with net extended in swift currents is very difficult. If the drift boat is unable to detect the anchored halibut boat in time, there is some possibility that the drifting gillnet will "wrap" the latter. Stories of drift gillnetters wrapping platforms and objects such as the Kalgin buoy are provided in subsequent sections of this report.

If the angle of the anchor line and the drifting gillnet are such that net can ride up the anchor line, there is potential for capsizing. In such cases, the charter operator would need to rapidly cut the cork-line of the gillnet. Interactions between the vessels reportedly have resulted in significant loss of gear and damage of vessels. One drift fisherman reported having observed a gill net moving in a strong current quickly work its way up the bow of an anchored charter vessel, ultimately shearing the cabin from its hull.

W. Hybrid, one of the most frequently recommended informant in our core sample of seasoned drifters, reports extensive experience with drift gillnet-halibut charter interactions. His perspective is common among drift gillnetters and particularly relevant given that the fisherman resides in and operates his vessel from the southerly portions of the drift fleet area, said to be the zone of primary interaction with the halibut charter fleet:

> "The main problem is the charter boats anchoring. They anchor out there, and I don't have the words to tell you how angry that makes me. I was laying my net out and . . this idiot was anchored out and I kept hollering at him and he didn't do anything. I had to pick my net up quick! If the net hit the boat it will go over the boat and take the people down with it. I screamed at the people to get their heads inside the boat. I don't understand why it is that we have all these safety devices yet none of those people have life jackets. We are a helluva lot more safety conscious . ."

Numerous informants spoke about personal experience with such interactions. Some reported pulling in their gear early, while others report gear damage. Some say they believe the problem will not be addressed until there are fatalities.

Figure 3-8 Two Drift Gillnet Crew Members Work the Net Offshore the Kenai Peninsula, Summer 2003

4.0 Drift Gillnet and Oil and Gas Industry Interactions on Cook Inlet

This section describes interactions between the drift gillnet fleet and oil and gas industry infrastructure and associated activities in the Cook Inlet region. The section emphasizes the three forms of potential interaction that are most frequently mentioned as points of concern by drift fishery participants, and that are of obvious analytical importance given the purpose of this study. These are: (1) the potential for emplacement of a stationary drilling platform in a place that could disrupt drift gillnet harvest or navigation activities, (2) the potential for spilled oil to affect salmon resources or to affect drift operations during the summer season, and (3) the potential for increased vessel traffic in the active drift gillnet zone.[16]

We attempt in this section to report interaction issues in an objective fashion. Observations and logic do suggest some potential for problematic interaction, but the issues are also obviously politically charged. We therefore use a combination of observational data, information from existing literature, and interview data to enhance the validity of the information and analysis.

The perceptual data from the interviews are complex given the nature of the relationship between fishing and oil and gas industry interests in the study region. These relationships are expressed differently across our sample of drift gillnetters. The words of two of our highly recommended informants, both members of UCIDA, one residing in Kenai, the other Homer, exemplify the differences and similarities in perspective. The first, D. Earle (in the top four of our sample of recommended drifters), offers a candid perspective that suggests tolerance rather than heightened affection for the oil industry, this despite his residence in a region and state significantly involved in and dependent on oil and gas development:

> Part of the problem with fishermen and the oil industry is that so many of the fishermen work in the oil industry and they aren't making much money fishing nowadays. They see that oil is what will save them economically. If we were getting a good price for our salmon you can bet your last dollar that the fishermen wouldn't be so cozy with the oil guys. They didn't used to be. I'm sure not. But I've got a different perspective because I live in Anchorage and I have another way to support myself other than oil.

D. Boot from Homer (another highly recommended drift gillnetter) offers a more supportive point of view of the offshore industry, despite his residence in an area where many hold patently anti-development perspectives:

> We have to have the fuel industry like it or not. The way we are set up, it is what runs our boats and car. Look at what it costs us when we can't produce oil from our own country [the informant refers to crises in the Middle East]. We should try to do as much exploration here as we can. My only real concern is pollution. We've already had one major oil spill, but it wasn't really even the oil company's fault. I don't think they're doing a bad job. There *is* pollution, but there is pollution coming from our boats too.

[16] Offshore loading of tankers in Cook Inlet is discouraged in both Stipulation No. 4 (Transportation of Hydrocarbons) (see MMS 2003a:II-13), and in the Tri-Borough Position Paper, which comments on important elements of the Cook Inlet OCS Lease Sale program. The issue is therefore not likely to be relevant to drift gillnet fishing operations and associated concerns.

> Think about all the pollution that comes from cars and boats alone. So when we talk about oil spills and pollution, we also need to think about our own use of cars and boats.

Such is the typical range of perspectives and the nature of their reporting among our sample of seasoned drift gillnetters. The mixture of ideas indicates the close relationship between fishing and the oil and gas industry in the region.

This section begins with an overview of the zone and topics of interface between the Cook Inlet drift gillnet and oil and gas industries. These materials preface more in-depth discussion of real and potential interaction events based on the reported experiences and perspectives of our panel of highly recommended drift gillnetters. A brief summary of popular news media reports of industrial accidents on the Inlet is provided in Appendix D of this report.

4.1 The Drift Gillnet and Industry Interface: Overview

Fishing and oil and gas industry interactions in the state jurisdiction waters of Cook Inlet are not new; nor are associated political and legal processes and positions. Flagg (1992:7) argued that such interactions already had a long history in 1992. At that time, UCIDA opposed potential loss of habitat associated with "site preparation, shoreline alteration, dredging and filling, and disposal of drilling muds and cuttings." The author conceded that most oil industry activity had to date occurred north of the principal fishing areas in the Inlet. But he asserted that "if commercial quantities of oil and gas are discovered and developed in offshore areas of central and Lower Cook Inlet, conflicts between the two industries can be expected to increase dramatically [with] loss of fishing gear [becoming] a serious concern to both salmon drift fishermen and shellfish fishermen" (Flagg 1992:15).

Portions of the OCS area of apparent interest to the oil and gas industry coincide with portions of what ADF&G describes as the Central District Drift Gillnet area (Fox and Shields 2003:29). While about half of the drift gillnet range is on the OCS, the most likely area for potential interaction between the fleet and oil and gas industry infrastructure is limited to the northeastern portion of the OCS or the most southeastern area of fleet activity. This includes part of the Cosmopolitan Unit, and an area extending to the southwest of Cosmopolitan. Thus, the OCS area of apparent interest does include portions of the east and middle rip zones favored by fishery participants at the southern terminus of the fishery (LGL 2000; Alaska Division of Oil and Gas 1999a:5-46).

But as noted by our panel of seasoned drift gillnetters, without knowing more precisely the location of the OCS area of interest to the oil and gas industry, it is difficult to identify: (a) the exact area of likely interface, (b) the extent of historic or contemporary drift gillnet activity in the exact area of potential interface, (c) the kinds of challenges platform infrastructure and associated activities may or may not incur for the fleet given variation in conditions across the Inlet, and (d) specific reasonable mitigation options under specific conditions and operations across the Inlet. In the absence of precise knowledge, we necessarily proceed with analysis under a more generalized scenario in which there is some potential for interaction to occur in the northeastern portions of the Cook Inlet OCS, which is also the most southeasterly range of the drift gillnet fleet.

Logic and aspects of local history suggest that oil and gas industry activities on the OCS have some potential to affect the future of fishing activity in Cook Inlet, including the drift gillnet fishery. Offshore and onshore pipelines, marine terminals with offshore loading platforms, and tank vessels would be needed to enable production operations. It is clear that some degree of interaction between such infrastructure and/or operations and the fleet is inevitable. A platform on the OCS could clearly affect drift gillnet navigation, as described in following sections. Oil spills have had demonstrable effects for some fishery participants in the region, with mixed economic outcomes. Real and potential effects notwithstanding, litigation seeking to obviate oil and gas industry activities in state jurisdiction waters based on arguments of potential future effects on the drift gillnet and other fisheries has met with little direct success (for example, see summary review of Supreme Court of the State of Alaska (1996) in Appendix B).

Figure 4-1 View of the Cook Inlet OCS from the Bluff above Ninilchik

The *Final Findings of the Director for the 1999 Areawide Oil and Gas Lease Sale* (Alaska Division of Oil and Gas 1999:5-47) responds to this precedent with sensitivity to the interests of the region's fisheries and their representatives, determining that certain industry activities could affect commercial fisheries in the Cook Inlet region and that mitigation strategies could subsequently be warranted on a case basis. These perspectives are further supported by EIS findings and assertions associated with Lower Cook Inlet OCS Lease Sale 149 in 1995, and through findings in the MMS EIS conducted for Lease Sales 191 and 199.

4.2 Issues, Perspectives, and Experiences

This section describes various issues associated with the drift gillnet and oil and gas industry interface on Cook Inlet. We review various issues, but apply special descriptive and analytical emphasis to those factors that (a) are of stated concern by drift gillnet fishery participants, and (b) data collected through the range of research methods used in this study suggest have or could pose problems for the fleet, and thus which are relevant for subsequent analysis of mitigation issues and options.

4.2.1 Seismic Survey Effects

Seismic surveys are used to detect oil and gas reserves. Concerns about the potential effects of such surveys on the region's salmon resources, and/or reduction of harvest through dispersal by noise, were reported in the 1995 Lower Cook Inlet EIS. These effects were thought to be readily mitigable with proper planning and timing with fishery openings (MMS 1995:IV.B1-8).

MMS (2003c: Table II.B-3) reports that fisheries-effects from seismic testing on the OCS, planned and coordinated with the commercial fishing industry, would be highly limited in both spatial and temporal terms. The agency reports that shallow-hazard geophysical surveys (seismic testing) would likely occur within a 62 square mile area for a total of between 14 and 35 days. This would occur sometime between 2006 and 2010 (2003c: Table II.B-1). As such, seismic testing effects on the region's fisheries and fish resources were also deemed to be readily mitigable in the EIS (MMS 2003c: Table II.B-3).

Given that seismic testing was not a commonly reported point of concern among drift gillnet fishery participants contacted during this study, and is deemed in this context to present minimal and readily mitigable effects, the issue is not a pointed focus of this study. It was, however, an important issue in Alaska in the early 1980s when it was perceived as a threat to commercial fishing interests in the Bering Sea and Aleutian Islands in advance of lease sales in the Norton, St. George, and Navarin Basins. Significantly, the situation lead to formation of the *Oil/Fisheries Group of Alaska*, an inter-industry committee charged with addressing potential interface issues between the fishing and oil and gas industry. While the group and its mission diminished in tandem with diminished interest in the lease sale areas, it served as a model for negotiating similar conflict on the California OCS (Fusaro 2004), and is discussed in further detail in the following section of this report.

4.2.2 Drilling Muds

Some drift gillnet fishery participants contacted during this study *have* mentioned concerns about release of drilling muds into Cook Inlet and the potential effects such releases might have on salmon stock, and particularly smolt and juvenile fish. A specific concern was expressed about potential release of drilling materials into the more southerly portions of the drift gillnet area since water conditions in those areas are often perceived as less turbid than those farther north.

Many drift gillnetters communicate fairly complex models of the Cook Inlet ecosystem, the growth and migratory patterns of salmon, and the potential effects that changes in the marine environment might have for the fishery. Some informants offered their understanding that the amount of materials that likely would be released would be minimal relative to the massive volume of water flowing in and out of the Inlet each day, and especially *in the midst of* high volumes of suspended and solid materials in the Cook Inlet water column.

While it was difficult in many cases to determine whether perspectives on this issue were rhetorical or scientific in nature, our conversations with our most highly recommended drift gillnetter, D. Sparrow, furthered evidence that there is indeed concern among some drifters that salmon fry could be affected by discharge of contaminants. The fisherman recommended that the timing of such release should be scheduled to miss the timing of smolt out-migration each spring. This is also the officially stated position of UCIDA representatives.

The 1995 MMS EIS reports that potential drilling and production discharges were not found to significantly threaten fisheries in Lower Cook Inlet. The 2003 EIS for Lease Sales 191 and 199 concurs with this finding, noting that:

> Drilling discharges could cause disturbance on [sic] demersal fishes and displacement from the immediate vicinity, within a radius probably not to exceed 100 meters. These effects very likely would be limited to only the short time periods of discharge (MMS 2003c: Table II.B-3).

Drilling muds from offshore operations would necessarily be discharged within EPA and NPDES guidelines, and authorized for exploration wells only. Drilling muds and cuttings for production wells would be injected via a disposal well or brought to shore for disposal. Given the nature of EIS findings and the apparent mitigability of this potential form of interaction, we do not emphasize its analysis in this report.

4.2.3 Subsurface Obstructions

Submarine pipelines present obvious hazards to fishing gear. But this was not commonly mentioned as a concern among informants contacted during this study, and it is a reported rarity in Cook Inlet (Bucerri 2003). While there is an extensive network of pipes and subsurface infrastructure in portions of the state jurisdiction waters of the Inlet, these are quite deep and generally out of the range of drift gillnets. There reportedly is more potential for interaction in the shallows adjacent to the eastern shore of the Inlet near the infrastructure-rich areas around Kenai and Nikiski, but those shallow contours are universally avoided for fear of grounding the

vessel. In cases where pipelines are present in navigational channels, they lay far deeper than vessel draft. Informant's stated concerns relating to underwater obstructions were rather primarily associated with potential failure of aging pipes and the possibility of subsurface blowouts, rather than with snagging or grounding.

While underwater obstructions and associated problems were not a stated concern for drift gillnetters involved in this study, these are important issues for fishery participants active along other parts of the nation's OCS. Fishing groups in California, Louisiana, Texas, and other Gulf states have long argued the need for compensation for fishing gear lost through snagging with underwater oil and gas industry infrastructure.

The *Fishermen's Contingency Fund* was established by law in 1978 as a standing federal funding and administrative source for such compensation. Significantly, the fund is available only for gear loss due to entanglement with OCS-associated pipelines and uncharted underwater obstructions on the OCS. While it does not address gear loss associated with visible infrastructure such as platforms, its history does provide some insight into mitigation issues relevant to the current research. The fund is addressed in more detail later in this report and is described in our literature review in Appendix A.

4.2.4 Surface Obstructions

The issue of interactions between drift boats and surface obstructions such as anchored vessels or drilling platforms is critical to the current description and analysis. This was a universal concern among our informants. Even those without direct experience of gear entanglement problems tended to resist the idea of any permanent obstruction in the fishing zone. J. Rank, a well-respected drift gillnetter from the southern portion of the Kenai Peninsula expresses common sentiment:

> We haven't fished around platforms for years. I've never gotten any gear wrapped around a platform. I've seen gear hanging on the legs though. You don't take a chance and you back off. I'm a conservative fisherman and try not to push my luck. I'm willing to skip the fish so as not to get messed up with a platform. I can deal with the platforms that already exist because they don't bother me much, but I don't want to see any platforms where we fish.

The nature of the drift gillnet fishery is such that the vessels drift downstream at a rapid pace. Unobstructed waters are ideal both for navigational safety and for unrestricted time for harvest. Downstream obstructions such as an anchored vessel require drift vessel captains to adjust course. This can be difficult and time-consuming when towing a long net, and more so when the net is full or partially full of fish. Rapid and lateral current movement can complicate the situation.

If, however, a surface obstruction is situated in a given location for a long period of time, its position can become readily known, and is more easily avoided than a less permanent

obstruction. This is not to say that a drilling platform is not or cannot be a hazard (sections of this report describe a variety of situations in which platforms have been and may become hazardous), but rather that drift gillnet captains can more readily adapt to its presence if its location and characteristics are known. But again, unpredictable lateral current movement can foil navigational strategies regardless of one's knowledge and awareness of a stationary surface obstruction.

While numerous exploration and production wells may be drilled in the event oil and gas industry activity on the OCS moves forward under the preferred alternative, MMS reports that actual offshore platforms and pipelines would be few in number and minor in scope. Emplacement of such potential obstructions is, however, "expected to result in some space-use conflicts" (MMS 2003c: Table II.B-2). Development of mitigation possibilities for such problems is the primary goal of the current project, and is described in the following section of this report.

4.2.5 Oil Spills

Oil spills are consistently mentioned as a point of concern among drift gillnet fishery participants assessing the potential effects of new oil and gas industry activities on the OCS in Cook Inlet. While drilling operations in state jurisdiction waters have endured no major spill problems, the *Glacier Bay* spill and the *Exxon Valdez* event continue to shape the generalized perceptions or stated perspectives and opinions of many. Informants active in the drift gillnet fishery in the late-1980s reported that oil from the *Glacier Bay* spill tended to collect in the rip tide zones, and that it lingered in the area for some time after the fishery was closed. The discussions tended to be unhappy ones in that the season had been a particularly productive and profitable one prior to the spill and closure.

The long-term and as yet unresolved nature of litigation associated with the *Exxon Valdez* spill event is sore point among drift gillnetters who stand to receive substantial awards in the event of settlement. That problem issue notwithstanding, it appears that despite its actual operational and corporate diversity, "the oil and gas industry" is, for apparent political-strategic and rhetorical purposes, sometimes labeled and described as a whole with disapproval.

Thus, some drift gillnetters interviewed during the study describe oil spills in the abstract as a potential outcome of an uncaring industry. Others report oil spills and their effects on fishing operations through direct experience. As noted above, most informants, and especially our panel of highly recommended drift gillnetters, tend to converse in a way that reflects apparent dissatisfaction with settlement associated with the 1989 spill, but while also revealing their belief that the presence of the oil and gas industry is vital to communities along the Kenai Peninsula.

One seasoned drift gillnetter and UCIDA member revealed this perspective, but while also forcefully injecting his opinion that prospective oil industry operations on the OCS should be conducted with all possible care for fish resources and habitats in the region. Some participants in the region reveal skills in expressing multiple perspectives and sensitivities while arguing for their own beliefs and/or those of their group of affiliation. Such is the nature of politics and

social realities in communities dependent on multiple natural resources and competing industries.

Scientific study and analysis (and history) make clear that large oil spills do pose a threat to fishing operations in Cook Inlet. The 1995 MMS EIS notes that large spills are the "greatest threat to commercial fishing, with both gear and catch at risk" in Lower Cook Inlet, since oil can affect juvenile salmon, public perceptions about contaminated product, and lead to fishing closures, loss of income, and marketing problems (MMS 1995:IV.B1-72).

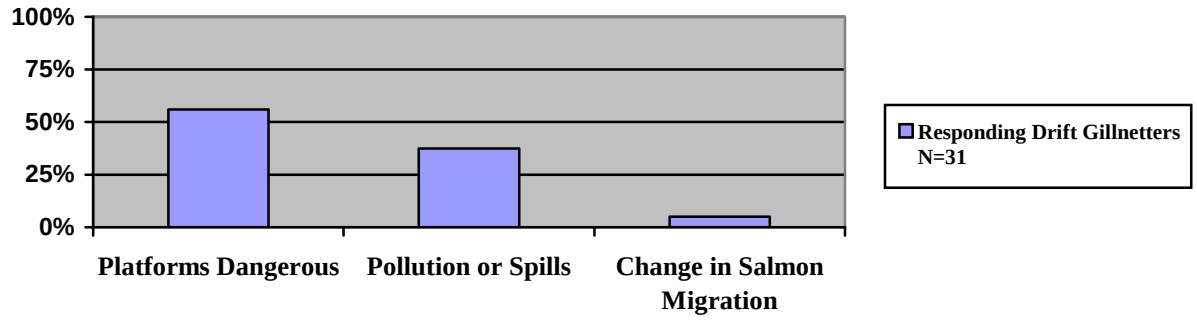
The MMS Final EIS for Cook Inlet Lease Sales 191 and 199 also indicates the oil spill threat to marine fisheries in the Inlet, including drift gillnet fishing. The assessment in the agency's EIS that "the chance for a large spill greater than or equal to 1,000 barrels occurring and entering offshore waters is 19 percent" reportedly led to concern among UCIDA leaders and subsequent re-thinking of the group's official position on oil and gas activity on the Cook Inlet OCS. Again, reported perspectives on spills and potential industry activity on the OCS are often tempered by a complex combination past experiences, political motivation, cognitive models about spill effects, and real concerns about the salmon resource and the drift gillnet fishery.

4.2.6 Platform Interactions and Drift Gillnet Fishing as a Fluid Operation

"Sometimes that net can seem awfully long"[17]

One unqualified finding of this research is that drift gillnetters have difficulty accepting the possibility that a drilling platform or platforms could eventually be emplaced in areas favored for drift gillnet fishing, especially in rip zones. Expression of resistance to the possibility is immediate and common. As noted in Chart 4-1 below, the perceived dangers of platforms were commonly expressed by seasoned fishermen participating in our protocol-directed interviews; more than half discussed platforms as navigation and gear hazards.

Chart 4-1 Leading Environmental Concerns among Drift Gillnetters



[17] Perspective of a Russian-born drift fisherman residing in Ninilchik.

Fox (2003) concurs with study observations that drift gillnet fishery participants especially like to fish the east and mid-rip zones, and that drifting in the most northerly reaches of the Inlet is more of an historical than contemporary phenomenon. Yet, discussions with fishermen in the Kenai area indicate that pre-development activities associated with the Osprey platform were on occasion factored into their navigation considerations. Other informants report that the presence of platforms such as Dillon, and Shell platforms "A" and "C" have on occasion figured into the manner in which they conduct or conducted their drift gillnet operations in the northerly reaches of the upper Inlet, and some report having wrapped their nets on the platforms in years past.

Conversations with oil industry workers while visiting Shell Platform A suggest such events were rare at best, and probable only during an era when pink salmon prices were good and some captains pursued them on their runs toward natal streams north of the bend at Point Nikiski. Nevertheless, our drift gillnet informants made occasional reference to interaction with platforms in the state jurisdiction waters, and given the relevance of the matter to the present analysis, we provide here some specific reports offered by some of our most highly recommended drift captains.

For instance, D. Earle (ranked fourth most highly recommended seasoned fisherman) says that about 20 years ago he came close to wrapping his gear around a platform, and that the near miss "ripped his buoy off." Mr. Earle resides in the Kenai area and in close proximity to the offshore rigs. Though he managed to avoid direct contact, F. O'Malley (also ranked fourth) reported some experience working around platforms in the upper Inlet some years ago, as noted below:

> "Years ago we fished up around the platforms. You have to avoid the legs of the platforms so your gear doesn't get wrapped around them. It's especially tricky when you have a net full of fish. I've seen numerous boats' gear wrapped around the legs. Fear mostly guides me away from wrapping. I'm cautious because I don't want to lose fishing time and don't want to spend the rest of the day waiting out the tide [to free the net during slack water at the change of tide]."

R. Merton (similarly prominent in our sample of seasoned fishermen) reported interacting with platforms early in his career as a drift gillnetter, stating that in one instance he knew his vessel and net were getting close to a platform but that it "came up in a hurry." The fisherman reported that his net actually wrapped about the legs, forcing him to motor around the area until the tide changed and the flow of the tide lessened its pressure on the net, whereupon he managed to free it and salvage some of his catch.

Relatively few seasoned drift gillnetters reported wrapping nets around platforms. But some did mention wrapping their gillnets around the Kalgin and Kasilof cans (navigational buoys). As noted below by seasoned drifter D. Mootan (ranked fifth in our network of core informants), given the nature of setting nets in strong currents, it is clear that one need not have empirical understanding of a wrap to calculate how a drift gillnet and its parent vessel might interact with a stationary object in its path:

> We used to fish up near the platforms in the '70s and early '80s . . I wasn't stupid enough to set in front of a platform on the ebb. You can't set above the platform if the tide is ebbing and you can't set below it if the tide is flooding or you'll wrap.

Navigating and fishing on Cook Inlet is tricky work. The interaction of tidal flow, wind waves, rip currents, and cold water are among the many factors that make the Cook Inlet drift gillnet fishery one of the more dangerous fisheries in Alaska. The physical enterprise of drift gillnetting is best conceptualized as a fluid process. Participants insist that as long as everyone and everything is drifting in relative motion, problems are unlikely since all objects are moving together. Even when vessels enter strong or extensive rip zones exhibiting lateral pull, drift gillnet vessels can usually negotiate the challenges – as long as nothing is in the way. Many problems arise when there is a need to change direction to avoid an obstacle such as a charter boat or buoy. This is because the very forces that are moving all unhindered objects along at relatively similar speeds and directions are the same energetic forces that must be countered to evade such an obstacle.

R. Merton reports, and direct observations support his and the assertions of other drift gillnetters, that there can be extensive lateral current movement in Cook Inlet, and that this must be factored into navigational decisions as a captain works his way through the rips and currents to find the fish. Moreover, once fish are in the net, speed and maneuverability are significantly reduced. Mr. B. Cuenta (fifth most recommended in our sample) offered the following analogy during a meeting with a group of seasoned drift gillnetters. He explained the nature of navigating on the Inlet, and the problem of introducing a stationary object into the fluid mix:

> "[Anything stable] situated in the middle of Cook Inlet would be similar to a concrete block dropped in the middle of the road – cars swerve to avoid it, but it is a matter of time before a car hits the block or collides with another vehicle while trying to avoid it."

D. Sparrow notes that the Kalgin and Kasilof Cans (buoys) are relatively unobtrusive, yet drift nets are occasionally wrapped around them, with and without fish. E. Thomas also expressed worries about immovable objects, namely, drilling platforms in the drift fishing zone, and especially navigating in such areas with fish in the net:

> "I can't see there being any platforms anywhere that would be appropriate except for south of our southern boundary. Another thing about the platforms. If they put platforms out there, where will the tankers go? When we used to fish around the platforms it caused problems. Up there in the Forelands it is a real problem because of the tides. When you have a lot of fish you are helpless and when you are around a fixed object you can't just move away from something like that easily."

D. Sparrow *did* wrap a net on a platform in the 1970s, and this may be affecting his revealed perspectives. His insight into that event and navigating in Cook Inlet with net in tow bears direct relevance to this analysis. Mr. Sparrow points out that under conditions of four-knot flow, a conservative current speed for Cook Inlet, a drift boat will travel about one mile in 15 minutes. Because it takes a minimum of 15 minutes to retrieve an empty net from the water, captains must in effect continually keep their vessels and nets at least one mile from any stationary object in their field of vision. Because full and partly full nets take much longer to retrieve and pick, this additional time lag must also be factored into navigation of the vessel, as must considerations about the power of the engine to tow a net in the conditions at hand.

Sea surface conditions and wind also play important roles in strategy and may work with or against the vessel. Sometimes more control is afforded when traveling into wind and/or current than it is on a "downhill run." Other times, wind, seas, and current present opposing forces and make for truly chaotic conditions. As noted above, lateral current movement and the movement of other vessels further complicate the mix.

Mr. Sparrow reports that on the day he wrapped his net, such complicating factors were minimal. He was working south of a platform on a rising tide with no significant wind or sea state, and had come into some nice action. The fish were picked and put in the hold as the vessel continued flowing north with the tide. The captain concedes that while the waters ahead are always on the drift gillnetter's mind, it is naturally the case that picking fish and attending to other tasks onboard detract from complete attention to "the road." In this sense, the highway and block analogy are also insufficient, because one can "get away" with non-continual focus as long as periodic visual checks are made.

But on this day, the captain looked up to realize with a start that the platform (he did not recall exactly which it was) was not far ahead and directly off the bow of the vessel. He hustled to correct course but realized it was too late and was forced to cut the towline. The net subsequently wrapped the legs. Mr. Sparrow reports that, upon release, the vessel spun away in time to avoid collision. But as he passed by to the north the platform and spun back into the current to assess the disposition of the net, his engine stalled. Since he was down-current, he was no longer in immediate danger. But the situation called for some quick repair and replacement of a distributor bearing. Once under power again, he motored back to wait for slack water and eventually peeled the net from the rig. While part of the catch was recovered, the net was reportedly in poor shape and had to be replaced.

Our panel of seasoned veteran drift gillnetters asserts that there is much danger in the potential interface between their vessels and oil and gas industry infrastructure. Some say that experienced captains can avoid the dangers, but also that one cannot rely on the less experienced to perform as well, and that unforeseen conditions can complicate navigation for both beginners and experts. Significantly, these perspectives often appear to be stated based on direct experience with platforms and/or on understanding developed through general long-term drift gillnet fishing experience on the Inlet, rather than rhetorically. Indeed, very few informants objected to drilling on the OCS in its entirety and for most the issue of primary concern is *where* a platform might be sited if that outcome becomes inevitable.

Meanwhile, platform operators also agree that there is danger associated with fishing around the structures, but suggest that the interaction has historically been a rarity. Some mention was made among workers during interview research on Shell Platform A that the monopod platform design, while slightly structurally weaker that the classic four-leg structure, would present less surface area upon which drift nets could wrap or vessels could collide. But it was clear in talking with workers on Shell A that Cook Inlet platforms are built to and do withstand immense forces:

winds, earthquakes, external icing, and various objects striking the legs while moving with the forceful current. The latter include large trees, and large chunks of ice in winter.

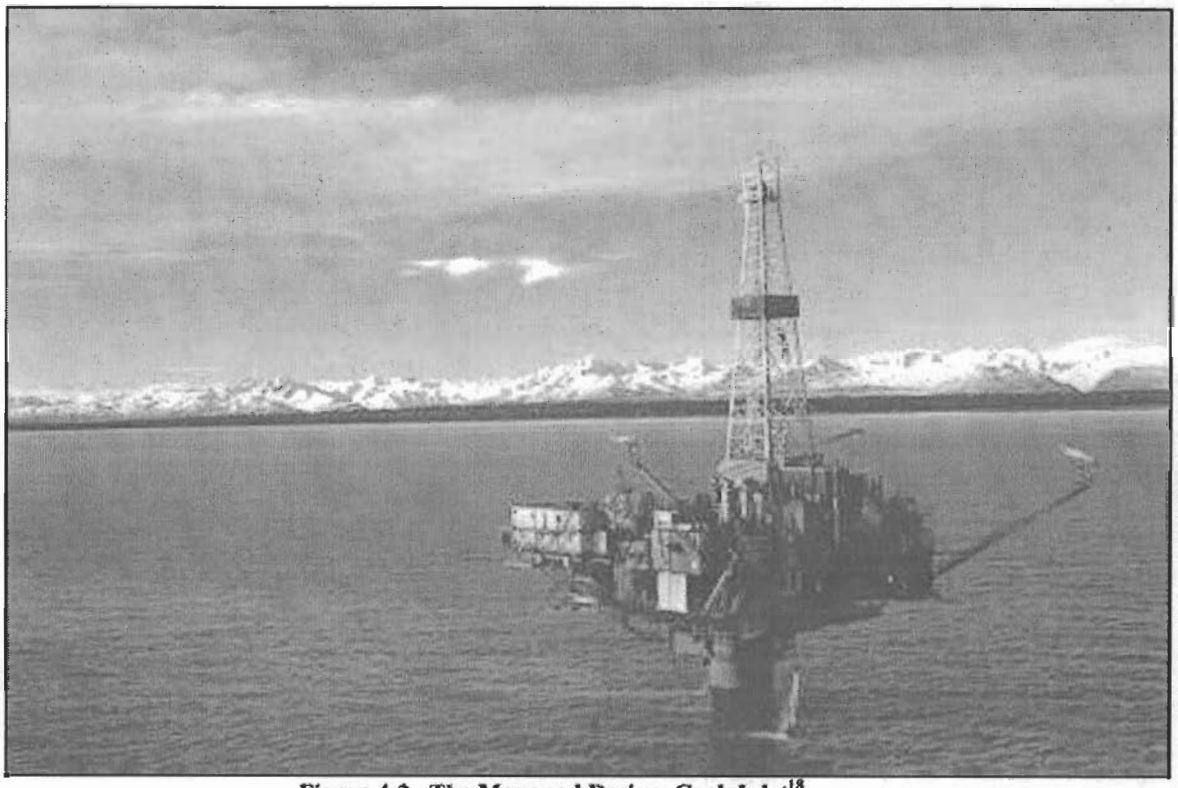


Figure 4-2 The Monopod Design, Cook Inlet[18]

There is strong consensus among drift gillnetters that platforms should not be emplaced in the rip zones. But a number of informants offered suggestions for appropriate siting locations based on their own models of understanding about where drift fishing might not be significantly affected. The shallows around Kalgin Island and the Forelands were mentioned as viable possibilities, although the oil or gas yield potential of these areas is uncertain. Of particular note in this regard, however, was R. Merton's repeated mention and the agreement of other seasoned drift gillnetters that the area between Anchor Point and the most southeasterly portion of the range of drift gillnet operations is relatively infrequently fished. As described elsewhere in this report, significantly, portions of this area lie within the Cosmopolitan Unit and part of the approximate area of apparent current interest to the oil and gas industry. Similarly unused areas are said to exist roughly east of the 18-fathom curve to the north.

[18] Picture available online at www.cookinletoilndgas.org/KPB/history.htm

Figure 4-3 Tidal Flow around Platform Leg at Shell Platform A, Autumn 2003

4.2.7 Vessel Traffic, Fluidity, and Cook Inlet as Navigational System

The cement-block-in-the-highway analogy discussed by our panel of seasoned drift gillnetters is useful in conceptualizing the effect of stationary objects for persons navigating on flowing water. While the logic of relative motion in the analogy is sound, the comparison simplifies the situation in reality. Vehicles on a highway travel on a static surface. A block dropped in the center lane disrupts the flow of moving traffic. Slowing vehicles are subjected both to the force of other vehicles still moving at faster speeds, and that of potential impact with the stationary block itself.

In the case of navigating on water, however, the "highway" itself is moving, and the speed and direction of a given vessel is conditioned by the speed and direction of flow. Introducing moving water into the example introduces another dimension of complexity. While the seasoned

navigator is capable of negotiating minor and even moderate changes in speed and direction of flow, non-uniform flow across space, and/or extensive lateral movement in any given area can also disrupt uniformity in motion and challenge effective maneuvering. As such, the relativity-in-motion model presented by the drifters is also simplified given the full dynamics of the setting.

The situation changes further when one or more vessels hold variable amounts of fish in the drift net, since added weight and surface area in the water column slow such vessels and change their maneuvering capacity to greater and lesser degrees relative to vessels with no or empty nets in the water. Seasoned drifter E. Thomas from the Kenai area (tied for fifth most recommended fisherman) relates some experience relevant to this discussion:

> "There are rips that can suck you in and cause you to lose control. One time there was a stupid guy next to me who saw I was getting fish. What he didn't see though, was that I was also drifting into him. So, what does he do? He lays his net out [to get into the action] . . He [clearly] sees me coming but doesn't move. Of course I know what is going to happen so I had to tow my net out of there. God, he was stupid. And of course there were no fish on the other side of the rip where he was. He didn't catch much there. Serves him right."

The concept of relative motion is central to the larger picture of navigational and safety issues in Cook Inlet. The previously described halibut charter-drift gillnet interface is another example of the potential implications of two vessel types moving towards each other at different rates of speed. In this case, a drift gillnet vessel commonly as long as 40 feet tows or drifts with an attached net that is typically 900 feet in length. Although the gillnet is usually curved in the water column and hence generally not extended to that length, it *can* be. Further, with towline at distance from the reel, it is possible for a drift gillnet vessel to present a total profile of 1,000 feet or more.

Meanwhile, vessels with a much larger profile are plying the Inlet on a daily basis. Various supply vessels, barges, ships, tankers, and ferries regularly use the shipping channels in Cook Inlet. MMS (2003c: Table II.B-1) estimates that between 912 and 1,825 supply boat trips may be made in conjunction with exploration on the OCS under the preferred alternative, and between 730 and 1,460 during development and production phases.

While there are normative nautical rules for giving way to larger vessels, and in some areas of the U.S. new terrorism-related rules about distance that has to be maintained from tankers, there are no restrictions against smaller vessels such as drift or halibut boats working in or steaming through the shipping lanes. This is, in fact, a common occurrence throughout the drift season. A repeatedly mentioned point of concern among drift gillnetters is that vessel traffic can tend to complicate navigation especially with net in tow, and otherwise detract attention from fishing activities. Fishing with long nets in challenging currents can be a particularly cogent problem when much larger vessels are navigating nearby. The latter are less likely to yield or alter course for what may appear to be a much smaller boat, despite the extensive overall profile of the drift gillnet vessel.

Awareness of non-fishing vessel traffic was related by one of the fisherman who provided the study team with an opportunity for participant observation on his drift boat. As is notable in the account, navigational awareness and expertise or lack thereof on the part of both operators can factor into a potentially serious situation:

> "Just a couple of weeks ago I was fishing two to three miles below Collier's Pier and there was a huge [expletive deleted] tanker heading right for us. I got on the radio and told them it looked like they were bearing down on us and immediately the tanker verged in the other direction [but didn't respond]. I don't normally fish in that area and I'm not a professional seaman and I don't know what the different lanes are. I can't believe that the guy didn't see me but I just wanted to make sure and that is why I got on the radio. That was pretty unusual, but who knows? I think the guy probably saw me on his instruments and knew what he was doing. I was just a little nervous with a 600 foot vessel heading toward me."

Some drift gillnet captains describe a particularly unhappy relationship with large oil tankers, asserting that there is little person-to-person communication between the captains of the massive and the small vessels. Captains of smaller ships and freighters apparently tend to communicate more readily and frequently with the smaller boats. Of significance for this analysis, UCIDA representatives have sought to communicate to its members known tanker schedules, and to the Coast Guard the scheduled and emergency openings for the drift gillnet fleet. There is thus a standing relationship between the fleet and the primary federal regulatory/enforcement body that addresses navigation issues in federal waters, and which might be further developed.

Despite common reports of navigational corrections by drift gillnet vessel captains, and reports of close calls, collisions are rare. While net wraps are reported, collisions between fishing vessels and platforms are very rare, and interview data gathered while on Shell Platform A for the purposes of this research indicated that only one or two such events have occurred in the last two decades, neither of which was highly significant in terms of damage.

There *have* been documented collisions involving platforms and non-fishing vessels. The latest occurred in 1997 when a tug and barge bound for Seattle collided with Platform C. There were no injuries aboard the platform, and the crew of the tug suffered only minor injuries. The platform was reportedly brightly lit and visibility was five to eleven miles. Damage to the platform was minimal and no oil was spilled (Anchorage Daily News 1997a:C1). The Chief Mate of the tugboat was charged the next day with misconduct and negligence. The Coast Guard found no evidence of equipment failure on the tug.

A collision between an oil industry vessel and a platform also occurred in August 1993. Approximately 13,000 gallons of diesel fuel was spilled when a spill response boat chartered by Arco collided with the leg of a drilling rig (Anchorage Daily News1993b:A1). Finally, the barge *Oregon* collided with the tug towing it from a Unocal facility near Nikiski. The barge capsized, but the hatch covers remained closed and the spill was minimal (Schultz 2003).

The few documented incidents of vessel-platform collisions aside, accidents in the existing Cook Inlet drill zone appear to be rare.[19] Navigational patterns among the range of vessels active in the area may be characterized as a functioning system. There is awareness among drift gillnet and other fishing vessel operators about the presence and movement of each other, about the presence and movement of other, larger vessels, and about the location of stationary objects such as the navigational buoys and platforms.

While the ultimate effects of adding a new stationary object into the OCS portion of this zone and system remain uncertain, it is clear that adjustments would have to be made by those drift gillnet vessel operators active in any new (prospective) platform area. The zone of interaction has to be seen as not entirely linear given lateral flow, and not entirely predictable given the dynamic nature of changing tidal flow and corresponding changes in rip currents and other features in the water column. The zone is also enlarged given that drift boats can present surface area profiles exceeding length of vessel, and must react with that profile to other vessels in the area. Moreover, any buffer zones associated with navigating in the vicinity of platforms or tankers passing through the OCS would further enlarge the zone of adjustment.

Given the nature of the drift gillnet fishing operation – its actual profile of exposure amidst other vessel traffic, its focus on areas of significant flow and current movements, its unique navigational challenges, its economic constraints, and its spatial-regulatory limitations – operational adjustments potentially necessitated by the presence of a new platform on the OCS cannot be seen as linear and straightforward. Rather, those adjustments have to be seen as occurring within a complex system of interaction between: (a) the drift captain and the marine environment within which he or she operates the vessel and gear, (b) the captain, crew, and other adjacent drift gillnet operators, (c) the drift gillnet operator and the full range of other fishing, work, freight, and tanker vessel operators active in and operating through their own venues in the area, and (d) the drift operator and the economic system within which he or she operates.

The system is complex to be sure. But as repeatedly asserted by drift boat operators during the course of this study, there is ample economic motivation for members of the fleet to work toward a solution that would enable the continued productive coexistence of the drift gillnet fleet and the oil and gas industry in the Cook Inlet Region. The State's *Final Findings for its 1999 Areawide Lease Sale* delineate specific potential forms of inter-vessel conflicts along the drift gillnet fishing corridor. These approximate the same issues addressed by the current study: problems navigating and fishing around platforms, oil spills, and navigation problems associated with increased vessel traffic.[20]

But it also conditions these with a strong caveat that with controls in place, the potential for conflicts are minimized. While there is clear precedent and obvious potential for drift gillnetters to physically interface with a platform emplaced on the OCS in the range of the fishery, there is

[19] A significant exception is the 1987 Steelhead natural gas blowout and fire. Roughly half of the platform was destroyed and repairs took nearly one year.

[20]Drilling discharges and seismic testing are not considered to present the potential for interrupting or significantly affecting drift gillnet operations in Cook Inlet under the preferred scenarios outlined in the State's Cook Inlet Areawide Oil and Gas Lease Sale (State of Alaska Division of Oil and Gas 1999:5-47).

similar precedent and potential for developing measures that would mitigate the potentially deleterious effects of that interface without undue disruption to the physical, social, and economic environments on and through which both the drift gillnet fleet and oil and gas industries operate. These possibilities are reviewed in the following chapter.

Figure 4-4 Oil Tanker in the Cook Inlet Drift Gillnet Grounds, and Vice-Versa

5.0 Identification of Possibilities for Mitigating Potential Spatial Conflict on the OCS

This section addresses the ultimate objective of the project to define and assess specific means and venues for mitigating the potential spatial challenges described in previous sections. A series of systematic efforts were undertaken to identify options for mitigating the prospective fishery-industry interface on the OCS.

First, our literature review brought to light various relevant studies and mitigation alternatives from around the world. These were analyzed and synthesized to inform our thinking about what has been tried and is currently being implemented to solve similar problems in maritime contexts elsewhere.

Second, in keeping with the study emphasis on documenting the perspectives and experiences of the fishery participants, each of our 31 protocol-guided interviews with seasoned drift gillnet captains involved queries designed to elicit mitigation ideas. Further, members of the core sample of 19 highly recommended drift gillnetters were asked to address the mitigation issue in various contexts, including focus group meetings held for this specific purpose. Individual telephone follow-up discussions were conducted to verify and refine the resulting information.

Third, area fisheries and oil/gas resource managers were asked to lend their expertise to the effort. These conversations were particularly fruitful in that such persons typically provided highly objective and candid analytical insight into whether the fishing fleet and offshore industry would be able to interact in a way that would enable mitigation of potential problems.

Fourth, we traveled to a Cook Inlet drilling platform to speak with offshore platform workers about various issues of relevance to the study, including possible ways to reduce potential safety problems around a prospective new platform on the OCS. Years of experience in this unique setting gave the workers unique and invaluable insight into the issues.

Finally, UCIDA representatives were repeatedly consulted about preferred options for mitigating potential interface problems. These interactions generated a series of discussions about a comprehensive means for addressing a range of critical issues through effective communication and collaborative planning.

5.1 Overview

Mitigation of interactions between oil and gas industry and drift gillnet operations has been a consideration in federal lease sale processes in the Cook Inlet region for some time. For instance, Terry et al. (1980) reported potential fishery-oil/gas interactions and mitigation possibilities for Lower Cook Inlet development scenarios early in the Alaska submerged lands leasing program. The 1995 EIS for Cook Inlet Lease Sale 149 recommended various mitigation strategies for relieving potential conflicts in Lower Cook Inlet, including sensitivity to timing of release of drilling materials vis-à-vis smolt out-migration. Scoping conducted in advance of the

scheduled 2004 and 2006 Cook Inlet OCS lease sales also noted that problem interactions could occur and that they could and should be mitigated:

> Commenters emphasized the importance of the commercial and recreational fishery of Lower Cook Inlet to the economic well-being and quality of life aspects of the area. They also expressed concerns over the effects leasing may have on these resources including conflicts that may result between offshore energy activity and fishing activity. Commenters suggested specific plans be developed to minimize and avoid commercial fishing gear conflicts with the exploration and development activities. Examples of areas identified where conflicts may result include riptide areas favored by driftnet fishing, areas of set net fishing, and the potential restoration of the Tanner Crab fishery around Cape Douglas (MMS 2002a:I-6)

An actual *strategy* for mitigating spatial problems between the fishing and oil and gas industries is noted in LGL's assessment of Cook Inlet rip tides and associated drift gillnet issues (2000:1):

> The possibility of offshore oil and gas industry development in Cook Inlet poses potential conflicts with the salmon driftnet fishery. Construction of stationary drilling rigs could create obstacles where fishermen typically fish. Oil and gas exploration and development and production facilities would add possible sources of contaminants to existing sources, i.e., commercial vessels and other boats. There is the possibility that spilled contaminants may concentrate along rip tides. Because some Cook Inlet fishermen fish predominately along rip tides, they have requested that the MMS consider excluding rip tide locations from future lease sales to avoid interference with the fishery.

The State of Alaska Division of Oil and Gas has garnered much experience with fisheries and oil and gas industry interactions in Cook Inlet. Litigation has driven some of that process, resulting in a fleshing out of potential mitigation strategies and a call for evaluation on a case basis:

> The division, during review plans of operation will work with other agencies and the public to assure that potential conflicts are identified and avoided to the fullest extent possible. Available options include alternative site selection, requiring directional drilling, buried pipelines, and seasonal drilling restrictions. Plans of operation are subject to the Kenai District Coastal Management Plan. Proposed operations will be evaluated and restrictions will be applied on a case-by-case basis depending on the specific activity proposed, its location, and the time of year.

The State's manner of examining and mitigating issues of potential conflict on a case-by-case basis is sensitive to variation between different types of proposed operations. The following section proceeds in similar fashion. That is, we examine a range of mitigation possibilities by specific issue of relevance to the study.

5.2 Mitigation Possibilities by Central Issue of Concern

In reiteration, this research effort indicates three principal forms of concern about potential physical interaction between the drift gillnet fleet and oil and gas activities on the OCS. These involve: (1) above-surface structures such as exploration and production platforms that may call for navigational adaptation since drift gear is long, Cook Inlet currents are swift, and buffer

zones are typically established around such structures; (2) oil spills that may shorten or close the drift gillnet seasons or otherwise affect the fleet, and (3) increased vessel traffic associated with supply or survey vessels, exploration rigs, pipe laying barges, and other vessels (Terry et al.1980:374-386).

Release of drilling materials and subsurface obstructions are not currently highly salient concerns for most drift gillnetters. The former is considered readily mitigable by MMS, and the latter is not a looming problem for the fleet. As such, these issues are not addressed here.

5.2.1 Mitigation through Elimination of the Potential for Interaction on the OCS

Drift gillnet fishery participants report concern that emplacement of a drilling platform in the drift fishing grounds could cause: (a) navigational challenges and hazards, (b) loss of total allowable fishing grounds, and (c) loss of gear and harvest. This sub-section presents options for mitigating such potential problems.

Deferral/Exclusion of Fishing Areas from OCS Activity

Previous sections have demonstrated how the particular manner of drift gillnet fishing on a highly dynamic body of water combines with various other factors to make the placement of drilling platforms in popular fishing areas on the Cook Inlet OCS a point of concern for the fishery participants. From the perspective of most drift gillnetters, should a platform option become reality, the most reasonable form of mitigation would call for its placement outside the drift gillnet fishing area. This was thought to eliminate the change for physical interactions between the fleet and drilling facilities, while also preventing any loss of total allowable fishing area that might be associated with an enforced buffer zone around a drilling platform.

There was much consensus on this perspective among the full sample of drift boat captains contacted during the study. No matter their place of residence, group affiliation, or other factor, the fishery participants expressed concern about potential obstacles in the drift zone. Experienced drift gillnetters tend to immediately reject the idea of new obstacles of any sort in "their" fishing grounds. The State of Alaska Division of Oil and Gas noted this obvious form of mitigation in assessing the fishery prior to the 1999 State lease sale:

> When fishermen encounter an object, they may have to pull in their gear until they pass by or maneuver around the object. Thus, a platform or temporary drilling unit would infringe to some extent on commercial fishing in the fishing corridor . . . Siting offshore facilities outside of the fishing corridor would lessen the potential for interference on commercial fishing in Cook Inlet (ADO/G 1999:5-47)

Fishing in the rip zones is not universal among drift gillnetters, but many if not most do focus much of their activity in those areas. The east and middle rips are most popular, in part because of their relatively close proximity to ports on the eastern side of the Inlet. Many of our informants asserted that such areas of focused fishing activity should be set aside for fishing only.

It should be noted at the same time that, again, many captains report appreciation for the potential economic benefits OCS activities could bring to the region, including additional jobs and revenue. Indeed, while the research team did encounter strong resistance to the scenario of a platform being sited in the drift grounds on the OCS, the highly recommended informants revealed surprisingly supportive views of OCS drilling in a general sense. There is thus at once strong opposition to disrupting the fishery, but general support for well-planned oil and gas activity on the OCS. This indicates an opportunity for interactive discussion between involved parties about how OCS oil and gas activity might best proceed vis-à-vis the spatial concerns of drift gillnetters.

Appropriate Siting: Identification of an "Area of Special Consideration"

If a platform-based exploration or production drilling scenarios are to move forward, the essential issue becomes one of appropriate siting. Despite that some captains reject the possibility of drilling across the entire Inlet, and despite extensive variation in reports about which areas are fished most frequently, our in-depth research revealed that certain areas in the allowable drift gillnet zone are not as important to the fleet as others.

Of practical significance in this regard is the aforementioned area east of the 18-fathom curve in the southeastern portion of the allowable drift zone. Early work with informants indicated this area is not frequently fished. Given that it is in close proximity to areas of known interest to the oil and gas industry, a series of additional interviews and mapping exercises were conducted to refine our understanding of its attributes. While the geographic parameters of the zone are necessarily "loose" and reflective of the tendency of fishers to fish opportunistically rather than rigidly, the effort did serve to verify an offshore area that is relatively infrequently fished, termed here a "Special Area of Consideration." This is depicted in Map 4-1 below.

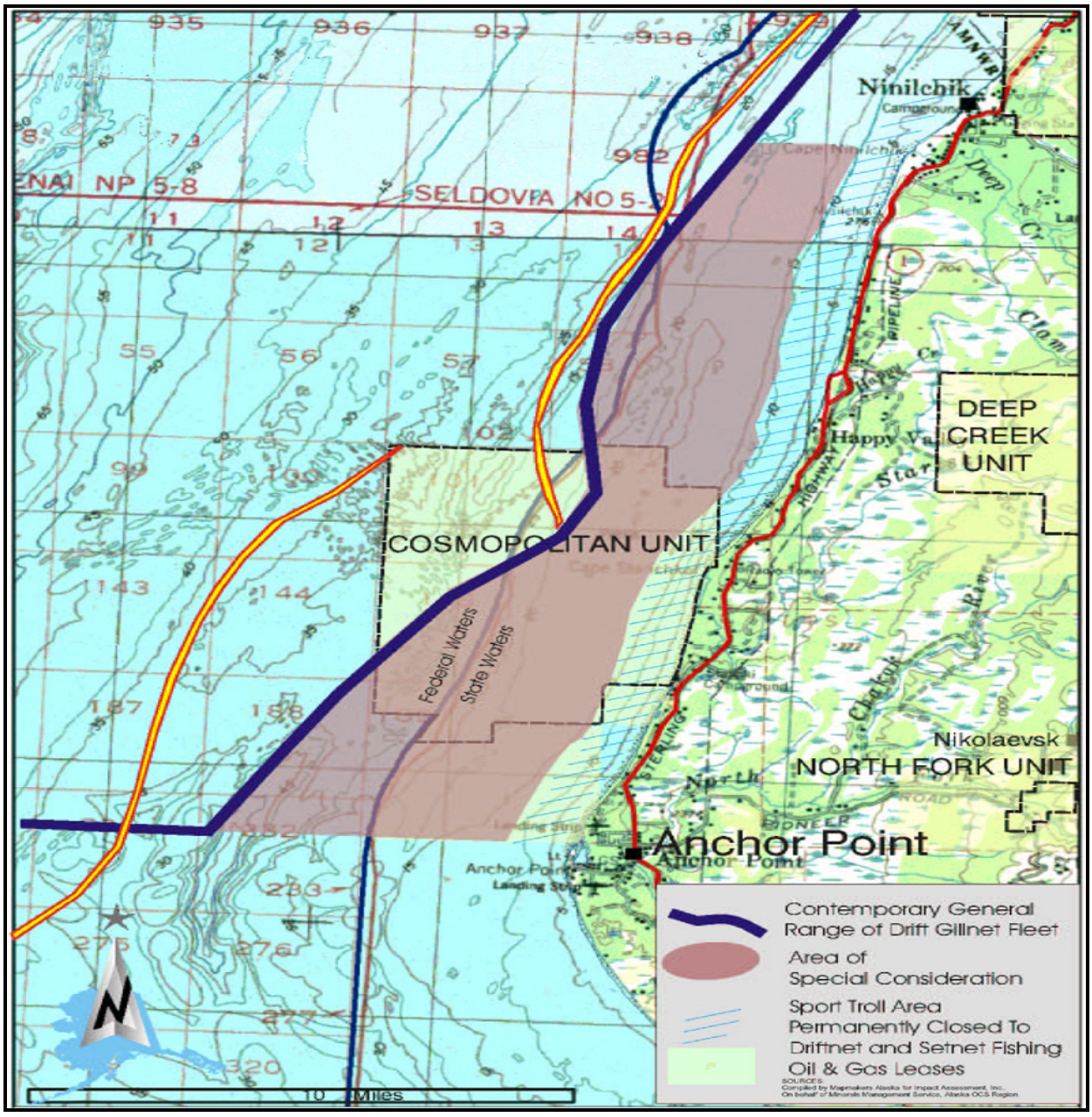
As noted on the map, the first offshore mile from Anchor Point north to Ninilchik River is permanently off-limits to the drift fleet, and managed for sport fishing. But the remainder of the area from one to about six miles offshore Anchor Point northeastward to a point about three or four miles offshore Ninilchik is fished only occasionally. Fishing reportedly occurs here primarily when strong southwesterly winds push salmon to the east, and at certain times during the early season when a few drifters "prospect" for northbound fish east of the east rip. But most often, most of the fleet will fish west of the east rip and middle rip zones.

As for others active in and knowledgeable of the southern area, M. Cards (a recommended drift gillnetter who resides in and focuses on fishing in the southern portion of the study area) asserts that the most southeastern portions of the allowable drift zone are not generally favored for drift gillnet fishing:

> "It wouldn't bother me if they put platforms south of the Anchor Point line [laughs].[21] But there's a big area there above Anchor Point and out to about six or six and a half

[21] There reportedly is some potential for yield in a general area some few miles south of the Anchor Point line and roughly 20 miles or so west of Anchor Point (Craig 2004).

miles that we don't fish. There's waves, and sand . . The Cosmopolitan area too, a platform in that area wouldn't affect me either."



Map 4-1 Area of Special Consideration

Mr. W. Hybrid (ranked sixth among the most recommended drift gillnetters in our sample, and a southern area resident) concurs. He describes a relative lack of fishing in the zone, but adjacent to an area that is very important to the drift gillnet fleet:

> "Now, from seven to about 12 miles out - that's the hot spot. But anywhere from about six or so miles off Anchor Point up to about three or four miles off Ninilchik, we just don't fish it much. [Usually] everybody stays west of the east rip .."

Efforts to identify areas deemed by drift gillnetters to be relatively more suitable for platform siting than others have been fruitful. Our findings in this regard may prove significant, but they are also general in nature. What is obviously missing is a more accurate understanding of specifically where drilling would likely occur on the OCS. A more specific scenario would enable more specific assessment of the reaction and formulation of spatial mitigation alternatives by the drift gillnetters.

MMS does provide an estimated range of 25 miles for distance from platform to shore (MMS 2003c: Table II-B-1, although there is indication that oil and gas industry interests also lay further east. Our "Area of Special Consideration" bisects the Cosmopolitan Unit,[22] and may therefore be meaningful in that it is near an area of known interest to the oil and gas industry. But its real significance in this regard will necessarily remain speculative until more is known about the actual interests of industry.

Extended Reach/Directional Drilling

Most of our core panel of seasoned drift captains offered extended reach drilling as an attractive alternative to drilling from a platform directly above the drift fishing grounds. Drilling from the shoreline, or from a point offshore that is not used for fishing, was advocated as a way to satisfy both interests.

But the actual feasibility of the extended reach option is not easily determined given that little is known or disseminated about corporate interests in fields within range of any directional drilling unit that could be emplaced from the shoreline or other area outside the fishing grounds.

As such, while it is a good conceptual solution to mitigating the potential interface, in reality it cannot automatically be seen as a cure-all, particularly if oil and/or gas reserves were to be pursued on the OCS at the further limits of the MMS-estimated range from shore to platform.

One of the longer extended reach successes in an offshore setting was achieved at the Xijiang field in China in the late 1990s. Roughly eight kilometers or nearly five miles of horizontal distance was covered to reach a yielding bottom hole (Tompkins et al. no date; Phillips Petroleum 1997). Based on local geology and drilling challenges encountered in the Cosmopolitan Unit, Craig (2004) estimates that extended reach technology could gain some two miles of distance from point of operation in this area, and possibly three under conditions of incremental improvements in reach technology over the next couple of decades.

[22] The Cosmopolitan Unit is comprised of roughly 23,369 acres of submerged and shoreline lands. It straddles federal and state jurisdiction waters in Cook Inlet, and is operated by Phillips Alaska, Inc. Anadarko Petroleum Company, Forest Oil Corporation, Devon Energy Production Company, and ExxonMobil also maintain working interests in the area. The unit remains in exploration status at the time of this writing.

This calls for some basic description of constraints on directional drilling. We note that use of extended reach technology is determined primarily by geologic conditions and cost/benefit considerations. The research may appear dated, but the constraints are constant and technological improvements have been slow to occur. Schmidt (1994), describes the unchanging nature of the technological challenge in the region, and confirms the challenges encountered at Cosmopolitan:

> The limitations of directional drilling are primarily dependent upon maximum hole angle, rate of angle change, and torque or friction considerations. In directional drilling, it is now common for the horizontal displacement of the bottom hole location to be twice the vertical depth of the well. That is, a well with a vertical depth of 7,000 ft. could have a bottom hole horizontal displacement of 14,000 ft. from the drill site. However, in a shallower well, such as one in which a potential target is two miles away from the drill site but only one mile deep, directional drilling would be much more difficult, risky and costly . . The type of geology or rock that must be drilled in order to reach a target may also limit directional drilling. Cook Inlet is particularly difficult because of its many coal seams and faults. Coal and shale deposits tend to collapse and cause the drill string to get stuck. Faults are difficult to track and if a fault is crossed by the drill bit, the type of rock being drilled may suddenly change and a new geologic reference must be established (Schmidt 1994).

Extended reach drilling is also costly, and this is an obvious consideration for oil and gas companies. The firms often deal with uncertainty of yield and encounter and respond with associated costs to unexpected challenges as boring progresses. Winfree (1994) summarizes some of the obvious cost factors:

> Perhaps the greatest limitation on directional drilling is cost. Although directional drilling may be technically possible, it is not always economically feasible. Factors such as where the oil or gas deposit is in relation to the drilling rig, the size and depth of the deposit, and the geology of the area, are all important elements in determining whether directional drilling is cost effective. The environment and the cost of multiple pads or locations are also considerations in determining the cost-effectiveness of directional drilling.

The viability of directional drilling as means for mitigating potential conflicts between drift gillnetters and oil and gas industry operations is dependent on a number of factors that are as yet largely unknown to us. Reaching potentially productive areas of the OCS from the shoreline is highly unlikely. But, significantly, when considered in conjunction with offshore distance potentially achieved by siting a platform on the western margins of the "Area of Special Consideration" described above, extended reach technology may hypothetically enable access to fields some reasonable distance into the Cook Inlet OCS.

5.2.2 Mitigation of Gear Entanglement, Loss of Harvest, and Platform Hazards

Drift gillnetters resist the idea of platforms in the drift gillnet zone. When informants *could* be encouraged to envision a platform or platform in "their" drift fishing zone in order to elicit potential mitigation possibilities, they typically reported concern about, or reports of seeing or being directly involved in, wrapping a net. The exercise also often elicited emotional response. For instance, when encouraged to think about how best to mitigate wrapping a net on a prospective platform, highly recommended informant D. Sparrow responded with intensity:

> Well, damn it, if it *has* to be then you have to look at it the other way around. If we went out there and somehow managed to shut down their platform for a day, how would they react? Well, they would start adding up the numbers – how much down time, how many man-hours lost, how much it would cost to replace the equipment. Well, that's how we have to look at it too. How many fish did I lose? What did the new net cost me? What might I have made if I could have fished the next two openings if I'd had that net?

The Fishermen's Contingency Fund and Needed Modifications

There is precedent in the United States for funding replacement of fishing gear lost due to interaction with oil and gas industry infrastructure on the OCS. This has been the role of the Fishermen's Contingency Fund (FCF), established as Title IV of the OCSLA in 1978. Most claimants are shrimp trawl captains in Louisiana who operate in close proximity to drilling platforms and other industry infrastructure, often in relatively shallow water. As noted in the federally-sponsored report titled "Assessing the Need for the Fishermen's Contingency Fund," (Gadsby et al. 2000:5), the intent of the Fund and the federal government's administrative role therein involves "reconciling the competing objectives of maintaining viable fishing industries while promoting the development of economical sources of energy."

Based on the intent of the FCF, in concept it could serve as a model for mitigating loss or damage of drift gillnet gear entangled in platform legs or other prospective industry infrastructure on the Cook Inlet OCS. But the FCF claimant and claim must satisfy various criteria prior to award (including the basic requirement that the fishing operation in question must be commercial in nature, and the entanglement not be attributed to a single entity). Most significantly, the obstruction causing the damage cannot have been charted or marked with a navigational aid when the loss or entanglement occurred. OCS-related pipelines are the exception to the charting rule.

There is at present no federally-administered mechanism for reimbursing gear or harvest lost to surface obstructions such as drilling platforms. We would suggest, however, that the unique environmental conditions in Cook Inlet (especially current speed and lateral drift), and the operational aspects of drift gillnet fishing on this body of water as described above, may warrant reconsideration of FCF criteria to include a special class of claims for this unique fishery.

The FCF is relevant to the Cook Inlet case in that it provides a model for how reimbursement for lost gear might be administered by the federal government through a claims process in which the burden of proof rests largely on the fishing captain. But it is *not* relevant in that the Fund does

not reimburse for gear lost or entangled on surface obstructions such as drilling platforms – the key issue in the current case. Further, while it does reimburse for losses associated with OCS pipeline entanglements, pipeline problems reportedly have not been a major problem in the deep waters of Cook Inlet.

Gadsby et al. (2002) report that, while the Fund is important and viable, it is not without problems. The authors assert that some fishers are duly reimbursed for losses, but also that there has been a net decrease in fishing grounds that hasn't been and can't legally be reimbursed by the Fund. This net loss is a result of increasing OCS activity (in the Gulf) and increasing amounts of underwater infrastructure which forces vessel operators to avoid previously fished areas. Meanwhile, improved charting and marking of such potential obstructions is said to be reducing the number of claim approvals. For example, there were 1301 claims and 860 approvals in 1990, but only 355 claims and 177 approvals in 1999 (p. 11).

The assessment report concludes that the FCF remains valid and should be continued under federal administration since there are no other legal or private sector options for compensating damages to fishing operations that are attributable to offshore oil activities. Yet, the reviewers also assert that "the fund ameliorates, but falls short of remedying the problems associated with underwater obstructions," and that "despite continuing increases in offshore oil and gas activities, the steady decline in claims paid and the declining area eligible for compensation [through increased charting and marking] underscore that the value of the fund to fishermen is eroding" (p. 24).

The reviewing body concludes that the benefits from the Fund are real but inherently short-term in nature, and that "the time appears to have come when offshore oil, fishing, and government should increase their focus on obstruction removal, site clearance, and mitigation efforts, rather than rely solely on the fund to compensate the fishing industry for damages" (p. 25). Thus, the lessons learned from the FCF relate more directly to (a) the production and post-production phases of OCS activity, and (b) submerged obstruction issues in relatively shallow waters. Both issues are, at present, largely tangential to the situations addressed by this study.

The Local Fishermen's Contingency Fund in California

Some of the shortcomings of the FCF for addressing gear loss and entanglement on the OCS in California were addressed via funds generated through per-barrel production fees required as part of permitting stipulations by the County of Santa Barbara. Santa Barbara is an area of extensive shore-side support for offshore development in both state and federal jurisdiction waters. This non-litigated agreement was negotiated to lessen the effects of offshore activity on local fishermen as it was deemed the local fleets were being displaced from historic fishing grounds and otherwise affected by offshore activities, and because pipelines constituted a physical linkage between offshore sites, both state and federal, back to Santa Barbara County (Armstrong 2004).

As such, the Local Fishermen's Contingency Fund (LFCF) was established in 1988 to complement the FCF by providing loan monies to commercial fishing vessel operators to enable

repair or replacement of gear while the often lengthy FCF claims process moves forward. The fund also reimburses fishers for costs associated with repairing or replacing gear damaged in state jurisdiction waters. A similar program is administered in Louisiana through the Louisiana Department of Natural Resources.

But the criteria for awards under the LFCF are essentially the same as those for the FCF. That is, the fund is largely irrelevant to the platform entanglement issue since it does not cover loss or damage associated with obstructions that are charted or marked with a navigational device. Pipelines are exempted in the LFCF as well. Again, the arrangement is not an appropriate measure for the mitigating the problem of gear damage or loss associated with an offshore platform. It does, however, exemplify a unique mechanism for generating funds for reimbursement to local fishing fleets from private industry sources, and administering them through local government. As described below, there is also a fisheries enhancement component to the local program (and to the Louisiana program).

The LFCF could thus serve as a model through which the State of Alaska and/or the federal government could induce the offshore industry to mitigate a problem interaction with the drift gillnet fleet. But in order for it to be beneficial in this specific instance, criteria for reimbursement would need to include entanglement with platforms in swift current conditions such as those that characterize Cook Inlet on a diurnal (tidal) basis.

An Emergency Response Vessel Program

Commissioning vessels that could be launched to help drifters in distress avoid collision or gear entanglement is a conceptually viable mitigating possibility. The possibility clearly holds some mitigating promise, for as noted by one of our seasoned drift gillnetters, the possibility of gear entanglement and/or vessel collision should be seen not only in terms of potential loss of gear or harvest, but also one of human safety and "the need for fishermen to deal with an additional source of fear."

There are actually a number of commercial vessel-assist operations active in the Cook Inlet region that could respond to an emergency of this nature, as could the U.S. Coast Guard. Representatives of Cook Inlet Oil Spill Response Incorporated (CISPRI) report that while CISPRI's mandate is primarily oil spill response under the Oil Spill Pollution Act of 1990, participating vessel captains, many of whom are drift gillnetters, would also likely respond to a vessel emergency of any kind under the maritime code of ethics. The CISPRI official with whom we spoke also reported that if its official mandate should change to include responding to stricken vessels, its members would be highly skilled and prepared to do so.

These remote response options are viable, but under the platform hazard scenario, by the time the operator of the stricken vessel deemed assistance necessary, travel time from port to point of offshore assist would often be too lengthy. This is particularly true when strong opposing winds and seas slow rescue time while simultaneously worsening the situation for the stricken mariner.

The key requirement of this mitigation option would be close proximity and/or quick access of response vessel to fishing grounds or platform. A common strategy for platform rescue work is to have available a "mother" rescue vessel with smaller deployable craft on board at the ready. Although the rate of current flow and sea state in a given setting are crucial considerations, risk assessment work undertaken in the North Sea in the 1990s (Riskassesor.com 2004) concluded some important relevant points about these matters:

> . . conventional standby vessels with open fast rescue craft operating at a distance of five nautical miles from the manned installation [platform] are capable of rescuing a single person within 30 minutes with 50 percent probability. The upper bound rescue time (90% probability) is 72 minutes. The upper bound reflects the difficulties in locating a person in heavy seas and conditions of strong current and wind drift (Riskassesor.com 2004: Section 2, page 3).

While locating a person in the water is more difficult than finding a vessel, the findings do provide some insight into response time. Most obviously, the closer the rescue craft, the quicker the response. As such, three viable options are envisioned. Each assumes a high-level of communication between drift gillnet vessel operator and rescue dispatch.

First, a platform-launched vessel would clearly present rapid and targeted response potential in the area of need. The technology to launch such a response vessel in Cook Inlet clearly exists, although observation of conditions around platforms during periods of strong tidal flow, and conversation with platform operators suggest this may be challenging. But such platform-launched vessels *are* used around the world. Numerous platforms in the North Sea are equipped with crane-deployed safety and rescue craft.

Such a vessel may also benefit oil and gas industry offshore operations insofar as it may serve to reduce any threat to continued safety on the platform itself. For instance, a rescue boat could potentially mitigate problems associated with scenarios such as a vessel without power approaching platform legs or other infrastructure, a vessel approaching a platform or other infrastructure while on fire, or a platform worker stricken during a period of high winds when platform helicopter rescues are impossible. The real-time nature of maritime emergencies is hard to predict, but at-sea response options may clearly reduce threats to life and property.

Second, a shore-side rescue vessel could prove valuable in responding to drift gillnet vessels in distress if it was dedicated to this use and kept at the ready. Logically, such a vessel would be moored in a place and position enabling minimal response time to the platform and surrounding upstream area. The "mothership" with auxiliary rescue craft could maximize scope of response, though this may not be necessary given that collisions and net wrapping were and are rare occurrences.

Third, mechanisms to enhance within-fleet cooperation to assist may in reality constitute the most natural and likely to succeed means for mitigating entanglement and collision hazards. Drift gillnet captains are the best candidates for assisting other drift gillnet captains since they typically: (a) work in close proximity to each other, (b) remain alert both visually and through radio contact to the situations of other drifters, (c) maintain a maritime custom of assisting other

mariners, (d) know the waters and associated hazards of Cook Inlet, and (e) know the nuances of nets, drift boats, and drifting. Therefore, response to emergency-type vessel, gear, and platform interactions might best be performed from within the fleet itself. Programs to formalize the skills and readiness of drift gillnetters in this respect may be underwritten by a number of parties. Given the mitigating intent of such programs in this case, industry and government could potentially avoid various fishery-offshore oil and gas industry interface problems through administrative support and or sponsorship.

5.2.3 Mitigation of OCS-Related Oil Spills Affecting the Drift Gillnet Fleet

Past experience and lingering issues associated with oil spills have left many of our seasoned drift gillnet informants with unhappy dispositions on the issue. While many drift gillnetters received compensatory monies from the *Exxon Valdez* event early on, and some still stand to benefit from punitive awards resulting from closures of the Cook Inlet fisheries following the spill, the long wait has conditioned thinking on what might ideally happen in the event of future spills affecting the region. Mitigation possibilities are thus perceived by the fishermen in terms of both physical response to spill events, and means for reducing potential social and economic effects of spills on the fishery participants.

Establishment of an Insurance-Type Oil Spill Bond

Some of our research participants have advanced the idea of an insurance-style bond that would serve multiple purposes in assisting drift gillnetters and other fishery participants in the event of an oil spill on Cook Inlet. According to its proponents, the most appropriate means of funding this sort of arrangement would be under a permitting stipulation that required oil and gas industries active on the OCS to pay into and maintain an insurance policy to compensate at some level fishers and other user groups affected by an oil spill, blowout, or similar event. From the perspective of the drift gillnetters, compensation amounts would be based primarily on the value of lost gear and harvest value. Secondary losses, such as diminished value of seafood products in subsequent years, and loss of lifestyle issues, were also discussed by the fishermen. Many fishermen are not aware that the Oil Pollution Act of 1990 requires operators of offshore facilities to maintain evidence of financial responsibility of $150 million to meet liability potentially associated with a spill or other oil pollution event.

Time Limitations on Spill Litigation and Settlement

Members of our core panel of drift gillnetters asserted that one viable means of mitigating spill effects on the fleet would involve limiting the amount of time involved in litigating and settling spill claims. Clearly based on their experiences with *Exxon Valdez* oil spill litigation and settlement processes, these participants felt that Cook Inlet OCS lease sales should be conditioned by such stipulations. W. Hybrid recommended a top-end limit of five years to process spill litigation and claims – a limit based on his personal tolerance. While this recommendation was made with visible enthusiasm and consensus at the group meeting held

with drift gillnetters in the southern portion of the study area, it should be noted that there is no precedent, mechanism, or likelihood that due process could be constrained *a priori*.

Involvement of the Drift Gillnet Fleet in Spill Response Activities

Many of the drift boat captains with whom the research team interacted during this project are expert navigators and possess extensive knowledge of the unique marine environment of Cook Inlet. Some participate in the Ship Escort/Response Vessel System (SERVS) in Prince William Sound, and others work or have worked for CISPRI. As recommended by various seasoned drift netters during the present study, one potentially highly effective means of mitigating spills and their effects on the region's fish resources and fisheries is to further recruit and further involve drift gillnetters in oil spill response contingency plans and programs. According to some informants, monies for funding programs that would pay expert fisher-navigators as spill responders should come from the above-mentioned insurance bond or from an as yet to be designed publicly-administered program specific to Cook Inlet. It was suggested that this group might potentially interact with the Cook Inlet Regional Citizen's Advisory Council (CIRCAC), established in the region in the early 1990s following the *Exxon Valdez* event in Prince William Sound.

5.2.4 Mitigation of Vessel Traffic and Spatial-Navigational Issues

Given spatial constraints imposed on the fleet by the contemporary drift gillnet regulatory regime, many participants speak with concern about potential additional limitations that might result from emplacement of a platform in the Inlet. Increases in supply, maintenance, and other vessel traffic during various phases of OCS exploration and development were seen to have the potential to affect navigational patterns and other aspects of fleet operations. This sub-section addresses possibilities for mitigating these potential problems.

Regulatory Concessions

Some seasoned drift gillnetters stated an interest in receiving concessions to existing fishing regulations in exchange for: (a) loss of fishing grounds around a platform, (b) down time associated with prospective OCS operations, and/or (c) forced alterations to fishing operations and/or navigational patterns as might be incurred through increased vessel traffic to and from a platform. This was particularly attractive to our panel of core informants in that many asserted that fishing production has been slowed by seasonal and area limitations, and that another potentially impeding factor could further diminish production. But from a regulatory standpoint, it is clear that any addition of concessions to limits on drift gillnetting would require a complex set of changes to ensure the objectives and goals of resource management are met, including balanced escapement allowance, maximum sustainable yield for multiple user groups, and so forth. The arrangement would therefore require some form of cooperation between participating federal and state government agencies.

Seasonal Restrictions on Drilling to Avoid Increased Traffic During Drift Season

Inasmuch as movement of supply and other vessels in the drift fishing grounds could be reduced, seasonal or other temporal restrictions on drilling were seen to have some potential for mitigating changes to the existing system of navigation on Cook Inlet, and the relationship of the drift gillnet fleet to that system. But it should be noted that the volume of OCS platform vessel traffic would likely vary extensively between operational phases. While there would be various and extensive vessel activity associated with exploration and construction phases, platform-based production operations on the treacherous waters of the Inlet tend to be facilitated and supplied via helicopter rather than marine vessel traffic. In any case, given the brevity of the drift gillnet season and the fact that it occurs only on Mondays and Thursdays, limitations on industry vessel activity during that period would not require highly burdensome scheduling changes on the part of industry.

A System of Communication between Drift Gillnet and other Vessels

Finally, there may be utility in more optimal communication between tankers, drift gillnet vessels, and other vessel traffic on the Inlet. As one UCIDA representative suggested, this might be facilitated through stringent requirements that captains of tankers and other large vessels regularly provide their positions on a known frequency as they move along the shipping lane in the proximity of the fishing fleets. He reports that UCIDA and the Coast Guard historically have coordinated information about large-vessel activity, fishery openings, and other navigational issues, but that interaction with tanker operations has been "one-sided."

Alaska Division of Oil and Gas (1999:5-18) reports that tanker personnel voluntarily follow practices that reduce the chance for oil spills. By extension, in concept at least, these could also lend to awareness of drift gillnet vessels. Two of the more relevant practices involve having two licensed officers or one licensed officer and one marine pilot on deck at all times, and plotting fixes every 20 minutes.

In the late 1990s, the Coast Guard examined the need for tanker escort vessels in Cook Inlet (State of Alaska Division of Oil and Gas 1999:5-19). As an escort captain would necessarily be on the alert for potential problems with small vessels, the escort measure could obviously reduce the likelihood for problem interactions with a drift gillnet vessel. But the agency ultimately found that there was "no historical justification for an escort system for Cook Inlet, nor sufficient risk posed by the tanker fleet that currently operates" (p. 19). A stand-by tug for Lower Cook Inlet was recommended instead.

While drift gillnetters often do not believe tanker operations or emergency contingency plans incorporate their concerns, smaller freight vessels reportedly do communicate their position in the Inlet over specific VHF channels. Drift gillnetters believe that Coast Guard-enforced rules for oil tankers to do the same may reduce stressful situations and the potential for serious accidents on the Inlet. Further, such a strategy may reduce tension across the entire navigational

system and enable fishing captains to focus on the task at hand without the specter of large and rapidly moving vessels catching them unaware.

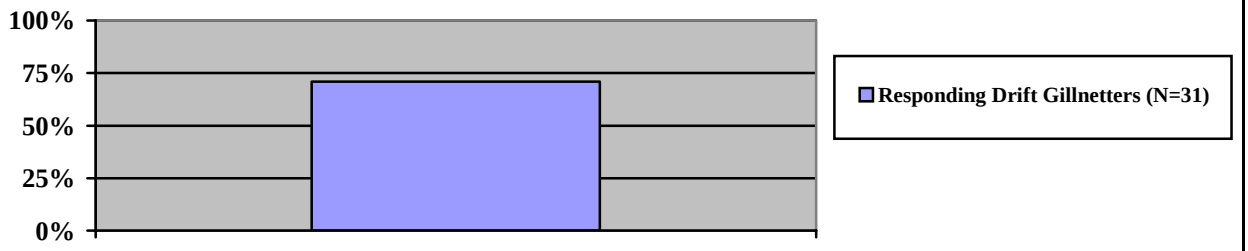
A concerted venue for improving communication between all parties is an obvious strategy for mitigating any potential increase in vessel activity as might be anticipated in relation to oil and gas work on the OCS. This might be best facilitated through a central communications and dispatch center.

5.2.5 Comprehensive and Communication-Based Mitigation Strategies

Some mitigation options identified during the course of this project are relatively comprehensive rather than highly specific in nature and potential effect. The aforementioned insurance bond, for instance, could serve to mitigate a variety of problem interactions potentially occurring on the OCS - loss of fishing gear or harvest, oil spills, collisions, and so forth. But insofar as there is little precedent or apparent likelihood of such a program being established, other comprehensive options must also be considered. Establishment of a council through which industry and fishing concerns may be voiced, also has the potential for broad-reaching effects in that this alternative may function as a general forum for collaborative solutions to a range of problems potentially affecting industries using the OCS in upcoming years.

The seasoned drift gillnet fishermen who participated in our protocol-directed interviews strongly supported the idea of a formalized means through which their knowledge and expertise could contribute to OCS-related decision-making and planning. In fact, there was much more agreement about the importance and viability of this option than any other. As noted in Chart 5-1 below, 71 percent of these research participants supported enhanced communication opportunities as effective means for mitigating problems between the fishing and oil and gas industry in the region. Our focus group work confirmed this interest.

Chart 5-1 Seasoned Drift Gillnetters Advocating Communication-Based Mitigation



This sub-section focuses on the precedent for and potential of such options. Two basic communication-based mitigation models are elaborated. Both are relatively encompassing in their potential mitigating effects, and both involve extensive input of drift gillnetters into OCS decision-making processes.

A Joint Council or Standing Advisory Committee

UCIDA representatives strongly advocated the establishment of a council or committee through which the concerns, interests, and expertise of their constituents could be formally expressed within or prior to significant OCS-related decision-making processes. Drift Association members envision a standing body of representatives from the drift fleet, from the set net contingent, from ADF&G, MMS, and other involved or responsible parties. The range of interaction issues explored in this report would be fair game for discussion in such a forum, and within the broad context of other relevant natural resource use, social, and economic issues of importance to communities in the region.

The intent of including representatives from the commercial fishing industry in such a forum is clear – to lend empirical understanding of the fisheries and environmental conditions of Cook Inlet to petroleum-related decision-making processes that could affect the region's fleets, fish resources, and associated habitats. Such representation would also presumably contribute to lease sale-related decisions and negotiation, including providing input about the most appropriate locations for emplacing platforms, and for mitigating the effects of the full range of exploration and production activities on the OCS.

There are examples of councils and committees that have been convened elsewhere to provide for the level of interaction and meaningful participation desired by UCIDA and many drift gillnetters. The *Joint Oil/Fisheries Committee* to address issues on the California OCS is one. The *Oil/Fisheries Group* organized and long since disbanded in Alaska is another. The newly formed *Ocean One* group in Canada provides a particularly powerful model.

The *Oil/Fisheries Group of Alaska* (OFGA), and California's *Joint Oil/Fisheries Committee and Liaison Office* (CC/LO) were closely related entities convened in the early 1980s to address problem interactions between fishing fleets and the offshore oil and gas industry on the Alaska and California OCS. Fusaro (2004) reports that the CC/LO was designed based on the guidance provided in early versions of *A Manual for Geophysical Operations in Fishing Areas of Alaska* (Hanley 1984), developed by representatives of the OFGA.

The OFGA was itself formed in 1983 in response to concerns voiced by fishing industry representatives then active in the Bering Sea, that oil and gas industry seismic vessels would likely interfere with and undermine their fishing and processing operations. The particular impetus for convening the group was related both to then-pending OCS lease sales in the Navarin, St. George, and Norton Basins, and to broader concerns about seismic testing throughout Alaskan waters, including Lower Cook Inlet. Fishermen were also concerned about gear loss and disruption of fishing operations associated with prospective OCS activity.

The inter-industry group was designed to involve representatives from several major oil companies, from the primary fishing and processing organizations in Alaska, and from a number of geophysical testing companies (see Hanley 1984 entry in Appendix A for a full listing of participants). The intent of the group was to "provide a forum for inter-industry communication, education, and resolution of potential problems related to [geophysical] operations in Alaska,

and to promote the successful co-existence of commercial fishing, processing, and oil industry activity in Alaska offshore areas (p. C-1). Initial meetings emphasized the importance of enhancing inter-industry communication and knowledge about operations and equipment in order to avoid and minimize inter-industry conflict.

The recommendations outlined in the 1983 manual draw upon the experiences of ongoing oil exploration programs in California and the North Sea, and information contained in the Alaska Oil and Gas Association's *Operating Guidelines for Marine Geophysical Operations*. Although the OFGA became obsolete, the principal recommendations it developed in the 1983 manual remain pertinent and highly relevant to the current research. We have taken the liberty of deleting specific references to seismic operations so as to underscore the utility of the recommendations for mitigating a broad range of interface issues, including platform and vessel traffic. These recommendations would be suitable for incorporation into a regional mitigation plan for the Cook Inlet industry interface:

(1) Consult fishing area maps and fishing season bar charts to ascertain whether planned programs will coincide with fishing activities;

(2) Consult additional information in the fishing industry to learn about the types of vessels, gear, fishing seasons/areas and types of fishing activity [oil and gas] operators are likely to encounter:

(3) Contact the regional representative of ADF&G to receive the most recent information on fishing seasons and activities. ADF&G has agreed to cooperate and will also disseminate information to fishermen regarding the [operator's] location, timing, and vessel;

(4) Consult with local experts in advance to determine the potential for conflict with fishing operations;

(5) Take measures to avoid conflicts. If potential conflicts have been identified, consider rescheduling operations to avoid times of heavy fishing activities. If operations cannot be rescheduled negotiate with affected area fishermen to temporarily remove their gear for appropriate compensation, or to make arrangements for appropriate compensation in advance if gear removal is infeasible;

(6) Be prepared to recognize (and avoid) fishing operation vessels and gears likely to be encountered during operations; make regular radio contact with fishermen to monitor fishing activities and gear placement;

(7) Contact the regional weather service broadcaster [or dispatch], who will disseminate information to the fishermen regarding offshore vessel and [infrastructure] location; and, finally,

(8) Use guide craft, aircraft, and observers in areas where [infrastructure] is [a potential problem] (which should be determined in a pre-operation survey of the area). Record and report gear damage caused by operations so that the fishermen can be expediently compensated.

The California-based Joint Oil/Fisheries Committee and Liaison Office (CC/LO) drew from the 1983 Alaska manual and its recommendations to develop a similar plan for the OCS offshore Santa Barbara and Ventura Counties. The CC/LO were established in 1983 to address inter-industry problems occurring between fishermen and oil industry operations in the state and federal jurisdiction waters of California. This was and is an area of extensive offshore exploration and production activity, and many fishermen have reported gear loss, vessel traffic problems, and other problem interactions and spatial conflicts.

In short, this was a challenging socio-political environment for attempts at discussion and negotiation between the industries (Cormick and Knaster 1986:9). But a professionally-mediated negotiating session was convened, and eventually led to the establishment of a formal means through which participants could interact and communicate on a regular basis. The Joint Committee involved the participation of five members from the offshore oil and gas industry and five from the fishing industry.

One of the more important functions of the Committee was communication about the timing of offshore testing and exploration activities. The Liaison Office was established to assist in relaying information between key members in each of the industries, and to provide a neutral meeting place and support for interactions. Its functions gradually expanded to include facilitation of claims between fishing operations and the offshore oil and gas industry, such as gear loss claims under federal and local reimbursement programs, and right-of-way issues and claims presented by both parties. The Committee and Office continue to function under state and local funding administration. Cormick and Knaster (1986) provide more detail about the origins of the program, as does Fusaro (1991:20):

> As an outcome of years of difficult negotiations on the issues of compensation for or mitigation of perceived negative impacts of the oil industry on the fishing industry, a proposal was made jointly by the oil and fishing industries to the State of California. The Joint Committee believed that state and federal oil revenue sharing monies (funds distributed to coastal states pursuant to OCSLA section 8[g], Public Law 83-212) were an appropriate source of funds to develop a series of innovative programs to mitigate some of the effects of multiple-use ocean development. After a long series of false starts and dead ends, the Joint committee and Liaison Office successfully secured 8[g] funds for these programs.

The author proceeds with specifics of the programs, with those selected for presentation bearing clear relevance to the prospective activities and potential effects of industry activity on the Cook Inlet OCS:

> [1] The State Secretary of Environmental Affairs contracted for research and development on new fishing areas, gear, or technology to seek means by which the fishing industry might offset the areal loss of fishing grounds caused by oil industry exploration and development
>
> [2] The State Coastal Conservancy identified fishing ports in which space and facilities were needed and could be provided for the repair of gear damaged by seafloor debris or other oil industry equipment or operations.
>
> [3] The Secretary of Environmental Affairs made grants of up to $5,000 per commercial fishing vessel over the three-year program for vessel or personnel safety and survival equipment, to enable fishermen to more safely expand their range beyond areas of multiple-use conflicts.

Clearly, the CC/LO provides a model for how a negotiating body might be formed, and what it might eventually accomplish in the interests of both the oil and gas and fishing industries operating in Cook Inlet. As many in the drift gillnet fishing contingent currently support the offshore oil and gas industry and what it brings and might in the future bring to the region in terms of economic benefit, a committee or council and liaison office established in the Cook Inlet region would initiate its tenure with pre-existing potential for collaboration. Interaction and discussions with oil and gas industry representatives and resource managers in the region indicate similar interests.

One Ocean is another communication-based entity established to mitigate problems between the fishing and oil/gas industries. This is a newly formed inter-industry organization that provides a forum for communication and information exchange between the in Newfoundland and Labrador. Inspired by similar liaison models developed by other jurisdictions such as the North Sea and Norway, *One Ocean* assists both industries in understanding each other's operations and activities so each can work safely and efficiently in close proximity. The organization works to solve various spatial conflicts and provide independent expert analysis of interaction issues.

The *One Ocean* advisory board consists of seven representatives from each industry, including members of the Fish, Food and Allied Workers (which has more than 20,000 members in Newfoundland and Labrador); the Fisheries Association of Newfoundland and Labrador, (an industry trade association accounting for some 80 percent of regional seafood production); and the Canadian Association of Petroleum Producers (a group representing 140 member companies of Canada's upstream oil and natural gas industry that works closely with companies, government agencies, and stakeholders to analyze various oil and gas issues. An independent Secretariat lends advice and oversight to *One Ocean's* mission in the region. The scope of this organization is quite large and complex in comparison to the prospective Cook Inlet and thus bears watching as a model for complex negotiations as it progresses through time and trying issues.

Slade (2004) asserts that, unlike similar entities elsewhere, *One Ocean* is inter-industry-driven. The group is focused on communication between and education of all participating parties, and was initiated in part as a means for industries and government entities to "start talking outside of

their own circles." An example is the group's role in informing each side about the technical and spatial aspects of a new submerged land sale in the Orphan Basin. The fishing representatives used *One Ocean* as a forum for presenting information about historical fishing operations active in that area, and the oil and gas industry (in this case ExxonMobil) presented discussion about three-dimensional seismic testing in the area. The Secretariat then converted the language of both groups, and framed it in relation to relevant regulating issues so as to generate mutually understandable information for all.

One Ocean has now been active for two-years. May (2004) reports that the group is enjoying success to date, and has gradually enlarged the scope of issues it addresses. There is indication the group's industry-funded four year budget of $200,000 will be renewed, although there is some movement toward converting the entity to a non-profit corporation.

Fisheries and Market Enhancement Programs

Previous sections of this report have described some of the challenges historically and currently faced by participants in the Cook Inlet drift gillnet fishery. Among these, problems with offshore oil platforms or other oil and gas industry activity cannot be seen as primary. But as described in Sections 3.0 and 4.0, the drift gillnet captain operates within a navigational and operational system that does have the potential to be disrupted by activities on the OCS

One form of mitigation of potential problems can be thought of as a kind of trade-off, wherein the risks associated with OCS oil and gas activity may be offset, prior to or after the fact, by programs seeking to reduce some of the cogent problems facing the fishery. There are such programs operating in Louisiana and California. As the programs have similar structure and intent, we review here relevant aspects of the Santa Barbara program only.

The Santa Barbara County Fisheries Enhancement Fund (SBFEF) was established in 1987 in conjunction with the Local Fishermen's Contingency Fund to "help mitigate significant impacts of offshore oil and gas development to commercial fisheries and the local commercial fishing industry." As for the LFC, funding for this program also derives from permitting stipulations that involve per barrel fee assessments on production from the Gaviota Marine Terminal, the Santa Ynez Unit, and the Point Arguello and Point Pedernales offshore sites. A wide range of projects have been funded through the program, including those listed in summary form in Table 5-1 below. The projects are listed as example of what might be possible for fisheries enhancement in Cook Inlet should a similar program be developed through a state-federal-borough arrangement to encourage nominal funding from the region's oil and gas industry.

Table 5-1 Santa Barbara County Fisheries Enhancement Fund: Project Examples

Project	Grantee	Grant Amount	Description
Santa Barbara Harbor Fishermen's Market	Santa Barbara Fishermen's Association	9,764	One-year start-up costs for the fishermen's market at Santa Barbara Harbor
Santa Barbara Harbor Ice Machine	Santa Barbara City	388,278	Purchase and install a new ice machine at the harbor
Waypoint Newsletter	Ventura County Fishermen's Association	12,000	Two-year start-up costs for a newsletter about fisheries affairs with updates on fishing and oilfield activity
New Fish Hoist at Santa Barbara Harbor	City of Santa Barbara	27,500	Assist hoisting fish landings on dock (due to increased congestion at Santa Barbara Harbor).
Grappling Hook and Gear	Southern California Trawlers Association	48,785	Equipment to retrieve and repair fishing nets snagged on subsea debris.
Fishwalk Interpretive Panels	Santa Barbara County and Santa Barbara City	29,359	Nine interpretive panels depicting regional commercial fishing
Morro Bay Net Repair Area	Morro Bay Commercial Fishermen's Association	7,000	Asphalt two areas for storing fishing equipment and repairing nets at Morro Bay harbor
Computer Upgrades at Morro Bay Fishermen's International Center	Morro Bay Commercial Fishermen's Association	1,750	Upgrade computer system of offshore weather patterns and water temperatures
Chinook Salmon Rearing Project	Commercial Fishermen's of Santa Barbara, Inc.	7,000	Expand the Chinook salmon rearing project from 70,000 to 140,000 fish

Source: County of Santa Barbara, Planning and Development, Energy Division. Available online at: countyofsb.org/energy/mitigation/fef.asp

As noted in the table, the program awards monies for a wide range of projects, from those highly specific to the physical-operational needs of fishers, to venues for communication between the offshore industries, to various resource and marketing improvements. Similarly, there are numerous ways in which the drift gillnet fishery and its resource base might be improved given the unique environs of Cook Inlet. A study of enhancement potential in the region is warranted.

Contributions to Cook Inlet salmon marketing efforts may be a truly advantageous form of mitigation for the region's drift gillnet fleet. Any meaningful analysis of mitigation in this context has to address the possibility that clearly has potentially far-reaching efforts for fleet – bettering the market value and/or distribution opportunities for sockeye and other species of salmon. While the economics of the salmon market are highly complex and related to a host of factors, including issues of national and global scale, providing some form of assistance to improve the economic situation for the drift gillnet fleet may be the best form of compensation that could be offered in return for problems associated with new oil and gas industry activities on the OCS.

Efforts to improve market conditions by marketing Cook Inlet salmon as "Kenai Wild" have been initiated by processors and harvesters in the region. The results of that effort have not yet been assessed in full. But an important motivation for encouraging external assistance is the fact that the harvesters are typically too involved in fishing itself and in other forms of employment to fully engage in the marketing end of the equation.

This situation has been observed by the authors in many contexts, and is noted of small boat commercial fishing operators around the world (McGoodwin 1990). In some cases, processors and distributors may attempt new marketing venues to improve revenues, but when successful, resulting profits may or may not reach the harvesters. If prices for Cook Inlet salmon are ever to approach even a reasonable percentage of former values, collaborative efforts need be applied to improving the marketing potential of the product and/or the likelihood that profit will reach the harvester. How the oil and gas industry might assist in marketing-related efforts or other means for improving the economics of fishing in Cook Inlet should be a primary form of discussion in the event a joint council or committee is convened in the region in the future.

There is observable willingness and interest among drift gillnetters to collaborate with industry, and there is widespread recognition of the economic importance of the oil and gas industry in the region. Indeed, many drift gillnetters work in that industry and depend on it for their livelihoods. While the difference in scale of production between commercial fishing and oil and gas production is truly immense, the tenure of each industry in the Cook Inlet Region is quite similar. The two forms of enterprise developed in tandem here. It may be in part for this reason that during the final moments of our last meeting with our panel of seasoned Cook Inlet drift gillnetters, there was strong insistence that this report communicate the desire of the fishermen to be at the table when regionally definitive resource-use decisions are considered and made.

6.0 Summary Findings and Conclusions

The research described in this report has enabled focused description of the Cook Inlet drift gillnet fishery and the nature of its historic and potential future interactions with oil and gas industry activities in the region. That description and supporting literature review serve as context for identifying and assessing appropriate means and venues for mitigating potential problems where these industries interact. This concluding section summarizes the project objectives and findings and presents a set of overarching recommendations for those affected by or involved in the Cook Inlet OCS planning and decision-making processes.

6.1 Summary of Project Objectives and Findings

Our first of two principal goals was to determine whether establishment of platform drilling and associated activities in the federal jurisdiction waters of Cook Inlet could actually cause problems for the drift gillnet fleet. The conflict outcome was thus treated as a working hypothesis, and various research methods were used to examine fleet and oil/gas industry operations and the nature of their spatial interactions in the region over time.

Based on understanding developed through this initial phase of the research, specific types of known and potential spatial conflicts were presented as subjects for discussion with a significant sample of seasoned drift gillnet fishery participants. The process served to satisfy our second principal objective which was to systematically identify reasonable possibilities for reducing the effects of such conflicts as potentially experienced by the drift gillnet fleet. Understanding of these possibilities and their implications were then refined and elaborated through focus group and other in-depth research methods with a core sample of highly recommended drift gillnetters. The resulting information was examined in light of relevant mitigation options developed in similar contexts elsewhere in the world.

6.1.1 Summary of Descriptive Findings: The Drift Gillnet Fleet and the Potential for Interaction with Oil/Gas Industry Activities on the OCS

Systematic research of drift gill net operations on Cook Inlet led to a set of important findings. Significantly, these clearly indicate that the navigational concerns stated by fishermen during the initial scoping processes associated with Lease Sales 191 and 199 are real, and rooted in the challenges of operating vessels under conditions that can test even the most skilled mariners.

Investigation of the way drift gillnet vessels operate in Cook Inlet clearly does indicate the potential for spatial challenges and hazardous interactions with prospective oil/gas industry infrastructure and vessels in certain portions of the OCS. But of equal significance, the research has uncovered important information that suggests: (a) spatial conflicts may be avoided through strategic planning on the part of the oil and gas industry and its regulators, and (b) many problems for the drift gillnet fleet potentially associated with prospective drilling on the OCS can be mitigated. Finally, the research indicates that while oil and gas industry activity on the OCS

could affect fishery operations in certain ways, the salience of the issue is in reality overshadowed by a host of economic and other challenges. Key findings include, but are not limited to, the following:

- Drift gillnet operators working Cook Inlet waters are currently encountering various challenges in addition to the perennial challenges presented by wind and sea and uncertain annual abundance of returning salmon. Market conditions and marketing problems are especially significant in the modern context, and threaten drift gillnet fishing as an economically viable enterprise.

- Finite salmon resources are allocated between numerous fishing technologies. As a result, the Cook Inlet drift gillnet fishery is extensively regulated. The regulatory structure includes spatial and time limitations to fishing activity. These regulatory constraints have a major bearing on the perceived viability of the commercial fishery in Cook Inlet.

- The fishery in question is conducted in an unusually challenging marine environment. The rip zones typically considered to be highly productive fishing areas can be extremely hazardous to navigation, and Cook Inlet currents as a whole can be swift, variable, and dangerous. These factors make emplacement of a stationary drilling platform in the fishing grounds a real cause of concern for drift gillnetters.

- There is some historic precedence of interaction between drift gillnet operations and oil platforms on Cook Inlet. While platform-related net wrappings and collisions in the state jurisdiction waters were and remain infrequent, reports of such experiences were reportedly harrowing for those involved. The infrequency of these events is attributed in part to the fact that existing platforms are well beyond the boundary for the present commercial fishery.

- With nets extended, drift gillnet operations can present a physical "profile" of up to 1,000 feet in length while fishing and navigating the Inlet. Operators report that despite this elongated profile, multiple drift gillnet operations can occur in close proximity as long as all are moving in unison with the current. Navigational problems typically occur when a stationary object such as an anchored vessel is encountered during the "drift."

- Tankers and other large vessels can also present navigational challenges to the drift gillnet fleet as they move against the current and, therefore, in opposition to the "drift." These challenges can, of course, be mitigated through effective radio communication, but the largest vessels typically do not make their movements known to fishermen nor do they respond to efforts by fishermen to establish radio communication during transit.

- Lateral drift induced by anomalous current movement can present additional challenges. Drift gillnet operators report that this phenomenon can significantly reduce the ability of captains to effectively respond to the need for course changes that might be required upon sighting of a stationary object or non-drifting vessel traffic.

- Given rapid currents, time involved in retrieving nets with various amounts of catch, and a host of other factors including those mentioned above, response time and strategies needed to respond to a stationary object in the fishing grounds can vary extensively. This is particularly important for the less experienced fisherman. The novice drift gillnet operator must learn how to deal with the range of challenges and conditions, while the seasoned participant has already tested and proven his mastery of vessel and tides.. There is thus a rationale for examining vessel operations on Cook Inlet as developed social and navigational *systems*. Introduction of new elements (such as a drilling platform and any associated changes in vessel traffic) may lead to shifts in those systems and associated need for adaptive responses and strategies.

- Of particular note in the data collection process associated with this project was widespread and vigorous resistance to the possibility of establishing a drilling platform in the drift gillnet fishing grounds of Cook Inlet. This was noted among the full range of fishery participants. While oil/gas industry activities are generally supported by drift gillnetters insofar as these could contribute to the regional economy, resistance to any OCS development activity that could negatively affect drift gillnet fishery operations remains a well-entrenched norm.

- This mixed perspective was additionally noted among regional drift gillnet association (UCIDA) leaders. Although such leaders reported official support for OCS lease sales based on potential economic contributions to the region, that support was qualified from the outset of the study by unconcealed dissatisfaction with aspects of oil/gas industry operations and actions in the larger region that posed a direct or indirect threat to the success of the fishery. Such dissatisfaction relates especially to the threat posed by potential oil spills that might contaminate their harvests or, worse, taint the long-term market for Cook Inlet salmon. The representatives were also sanguine about their ability to recover future losses from such an event, given the protracted nature of the *Exxon Valdez* settlement process.[23]

6.1.2 Summary of Mitigation Research Findings

Our approach for identifying reasonable alternatives for mitigating potential spatial conflicts (our second principal goal) involved multiple research methods, including: (1) thorough review and synthesis of pertinent literature, (2) preliminary interview work with the full range of research participants, (3) protocol-guided interview work with 31 seasoned drift gillnetters, and (4) focus group and other forms of research interaction with our core sample of highly recommended drift gillnetters. Following are select mitigation options identified as both potentially effective and feasible:

[23] Many of the research participants qualify for and await spill settlement awards. Frustration with the litigation process is obvious and appears to pervade perspectives on the industry in general even among those who strongly support its prospective growth in the region.

- Significantly, research participants commonly asserted that the most logical form of mitigation is to avoid placement of platforms in productive areas of the drift gillnet fishing grounds altogether, and especially in the rip zones. While the fishing grounds are extensive, there is also an area where drift gillnet fishing occurs relatively infrequently in the regulated fishing zone. This "*Area of Special Consideration*" lies east of the east rip zone from Anchor Point to Ninilchik and coincides with an area of potential interest to the oil and gas industry within and south of the Cosmopolitan Unit. Drilling could potentially occur in this area with minimized chance for problem interactions.

- Deferral of specific popular fishing locations from lease sale areas is a preferred option for many fishery participants. Our ability to fully assess spatial aspects of this alternative (and the alternative above) is limited since specific areas of potential interest to the oil and gas industry are as yet unknown.

- Extended reach drilling is also commonly envisioned among drift gillnetters as a feasible mitigation option. But the option is not a panacea in that the geology of Cook Inlet and existing technology are limiting factors, and such operations are costly. Analysts suggest an additional two or eventually three miles might be gained through extended reach drilling in the region. This option, combined with what additional reach might be gained through drilling from the western portions of the *Special Area of Consideration* could open up the possibility of exploration/production on parts of the OCS with minimized disruption of drift gillnet operations.

- Establishment of programs for funding replacement of fishing gear lost due to entanglement on platforms is considered a viable mitigating option. Arrangements for acquiring compensatory funds from the oil and gas industry through permitting processes do exist. There is, however, no precedent for coverage of net damage or loss due to platform entanglement. Programs such as the federally-funded Fishermen's Contingency Fund (NMFS) and locally-funded variations (e.g., Santa Barbara Local Fishermen's Contingency Fund) reimburse for pipeline and uncharted obstructions only. To be effective in the Cook Inlet region, comparable programs would need to be fashioned to accommodate the unique characteristics of drift fishing in swift and unpredictable currents in the proximity of OCS platform facilities.

- Establishment and administration of an industry insurance bond was advocated by seasoned drift gillnetters as a way to compensate for spill-induced loss of harvest and operational investment. It was not widely known among fishermen that the Oil Pollution Act of 1990 requires that offshore operators establish and maintain evidence of $150 million to meet liability potentially associated with a spill or other oil pollution event.

- Based on direct experience with spill litigation and settlement processes, some fishery participants asserted that OCS lease sales should be conditioned by stipulations limiting

potential future litigation and settlement to a specific time period. While this concern and recommendation are understandable, given their past and ongoing experience, this is not considered a viable option. No legislative or regulatory mechanism could be identified that would, in effect, circumvent legal due process.

- Because regulatory limits on the allowable times and areas for drift gillnetting are seen as constraining factors, many research participants reported that any further limitations resulting from emplacement of an oil platform in the fishing grounds should involve a "trade" for a longer fishing season (and/or more openings), and/or expansion of allowable fishing grounds. This is a viable form of mitigation, but would require extensive collaboration with state policy decision makers and development of inter-agency resource management arrangements.

- UCIDA leadership and the core group of informants strongly advocated establishment of a Joint Council or Standing Advisory Committee on fisheries and oil industry activities in the region. As presently conceived, such a council would be established to enable communications between fisheries, oil and gas, and government representatives regarding interactions on the OCS and associated management issues of importance to communities and stakeholders in the region.

- Given its centralized position in the social structure of the fishery, and its coalescing function in representing the concerns of drift gillnetters in the region, UCIDA should take a leading role in the workings of a Joint Council or Committee.

- The contractor has identified models for potential involvement of stakeholders in oil and gas and fishery resource management decisions in the study region. *One Ocean* is a newly formed inter-industry organization designed to provide a forum to enhance communication and information exchange between the fishing and oil and gas industries across the Canadian Maritime Provinces. The scope of this oil and gas industry-funded organization is quite large and complex and bears watching as a potential model for Cook Inlet as it progresses through time and trying issues.

- Any meaningful examination of mitigation in this context should identify means for enhancing the fishery in exchange for potential or actual problem interactions on the OCS. The Santa Barbara County model is an interesting example in that a wide range of enhancement projects are funded via industry fees stipulated through the offshore development permitting process.

- Given the economic challenges encountered by drift gillnetters, an ideal means for enhancing the Cook Inlet drift gillnet fishery would involve improving market conditions for harvested salmon. The participation of the oil and gas industry in collaborative efforts toward this end would likely contribute to mutually beneficial relations between these primary stakeholders.

6.1.3 Summary Conclusions

Analysis indicates that oil and gas industry activities occurring on that portion of the OCS used for drift gillnet operations could cause problems for the fleet. But it is also clear that the challenges to navigation and fishing presented by platforms, increased vessel traffic, or related factors, will not terminate the fishery. Cook Inlet drift gillnetters have in years past proven capable of adapting to the presence of platforms and associated offshore industry activities, if only in learning how best to avoid them.

But as this study has also determined, the Cook Inlet drift gillnet fishery is conducted within a system of relationships. The drift fishing system is a complex and dynamic aggregate of physical-environmental, social, and economic variables. Altering the nature of the way the fishery can be prosecuted in a given area would have spatial effects throughout the system.

As when flowing waters in a river are separated and increase force of flow upon meeting the foundation of a bridge, so would fishing pressure increase in other areas of a spatially limited system if a portion of it was to be rendered unusable. The width of that unusable zone may be narrow at its terminus, but variable lateral forces in flow coupled with (a) the profile of drift vessel with net in tow, (b) the presence of other vessels including large tankers, and (c) difficult-to-predict factors such as a vessel drifting without power, increase the potential width of that zone considerably. In terms of upstream considerations, the zone of reaction time to a stationary object depends on a host of factors inherent in the navigational system at any given time.

Thus, while emplacement of a platform is not in itself fatal to the fishery, it does have the potential to change the dynamics of the existing arrangement of spatial relationships in the Inlet. An oil spill on the OCS would have a similar effect on the fishery. For those already adapting to what are said to be cumbersome regulations, and to declining market conditions, introduction of a new constraint or condition in an already challenging environment may lead to diminished interest or capacity to continue, potentially resulting in further attrition to an aging fishery. This is the problem of “thresholds” – where a fisherman concludes that just “one-too-many” problems have arisen and it is time to quit.

Mitigating the potential constraining or damaging effects of new factors introduced into the existing system may serve to encourage ongoing participation and the health of the fishery. Effective mitigation plans and efforts may also enhance industry efforts to move toward exploration and development on the OCS in the region. Table 6-1 below depicts the primary mitigation options identified as feasible and bearing potential to further the history of productive marine fisheries and oil and gas industry in Cook Inlet.

Table 6-1 Summary of Identified Mitigation Possibilities Determined to be Feasible

Agent/Concern	Mitigation Option
Emplacement of Drilling Platform in Fishing Grounds Could Cause Net Entanglement, Navigational Problems, and/or Net Loss of Fishing Grounds	• Avoid emplacement in the fishing grounds • Defer rip zones and other important areas from lease sales • Consider reaching the OCS from the infrequently-fished *Area of Special Consideration* with extended reach drilling • Establish a fund that would reimburse fishermen for platform-related gear loss in the uniquely challenging environment of Cook Inlet • Establish a vessel response program to assist in platform-related fishing emergencies
Oil Spills or Blowouts Could Affect the Resource and the Drift Gillnet Fishery	• Involve drift gillnet fishery participants in spill consultation and response
Oil and Gas Industry Activities on the OCS could Increase Vessel Traffic and Complicate Navigation and Fishing in Cook Inlet	• Award affected drift captains concessions to time and area regulatory restrictions • Establish seasonal restrictions on drilling • Establish an organized system of communication between drift gillnet and other vessels using the Inlet, especially tankers
All	• Establish a Joint Council or Committee to enable inter-industry communication • Develop fisheries and product market enhancement programs to help offset potential problems resulting from offshore oil and gas activity.

The oil and gas industry contributes extensively to the study region - in terms of employment, economic output, tax revenue, and other important factors. This is well-known to residents of the Kenai Peninsula, fishery participants included. But given the geologic and oceanographic challenges of Cook Inlet, it is possible that in the end the projected costs of exploration and production will lead industry to search for oil and gas in other areas. Many steps remain to be taken prior to exploration and production on the Cook Inlet OCS, and the challenges are extensive.

The drift gillnetter also seeks to harvest and market a valuable product. The scale of production is quite different, but as described extensively in this report, the fishery is also very important in the region, and also faces extensive challenges. In this case, the concerns of its participants would be diminished if the value of Cook Inlet salmon could be enhanced and the spatial and economic tension of the fishery's system of operation could be reduced.

In short, both of the stakeholder groups described in this report face significant challenges. The potential utility of mitigation possibilities in this case lay not in denying either party full opportunity to produce, but rather in seeking an arrangement that would move each party along toward the end goal of productive and responsibly managed enterprise.

Collaborative and communication-based efforts toward that end may be the best way to proceed. The oil and gas industry in the Cook Inlet region offers considerable potential for contributing to solutions of problems being encountered by its neighboring drift gillnet fleet. Widespread recognition of its importance to the region indicates willingness on the part of fishery participants to seek out and support a balanced approach to offshore exploration and production in the spatial context of the fishery. Moreover, the drift gillnetters are highly knowledgeable of the Cook Inlet environment and its challenges to navigation - perhaps more so than any other group in the region. Transfer of information both about the fishery and about local conditions and challenges would likely benefit the offshore oil and gas industry in numerous ways. As UCIDA serves an important coalescing and representative function in the fishery, it could play an important role in an oil-fisheries communication venue to ensure that the knowledge and concerns of its constituency are fully incorporated into OCS-related decision-making processes.

Whether the fishing constituency ultimately influences the course of industry activities on the Cook Inlet OCS may in large part depend on the nature of communication between government, industry, and drift gillnet fishery representatives as industry moves through the many steps needed to actually explore for, and produce, oil and/or natural gas. As this project makes clear, there are numerous ways in which communication could be nurtured and facilitated. A venue for inter-industry interaction could enable meaningful discussion and negotiation of a wide range of issues of importance to all parties. Movement toward that end is strongly recommended as a proactive means for preventing problems that could otherwise occur and affect both forms of enterprise should they eventually interact on the Cook Inlet OCS.

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