

# STATE OF ALASKA

SARAH PALIN, GOVERNOR

## DEPARTMENT OF FISH AND GAME OFFICE OF THE COMMISSIONER

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RIN 0648 – AX50

Ms. Brix:

Following are comments from the State of Alaska regarding requests for information on the proposed designation of critical habitat for beluga whales in Cook Inlet as noticed in Federal Register Volume 74, Number 70 dated April 14, 2009. Our comments are arranged by data needs as specified in the advance notice of proposed rule making.

### **(1) Information on the past and current numbers and distribution of beluga whales in Cook Inlet:**

While there are some Cook Inlet beluga population estimates collected by the Department of Fish and Game (ADF&G) between 1960 and 1980, these data were collected in a manner that does not allow direct comparisons with data collected by NMFS since 1994. The Department believes the time series of standardized population information collected by NMFS represents the best available scientific information on population size, and when combined with movement information from satellite tagged belugas, geographic distribution. As the photo-identification work being conducted by LGL becomes refined it should be considered as an alternate method for population size verification.

The Department requests the Service complete its analysis of collected calf count information. This information is critical towards understanding population age structure and recovery of beluga whales in Cook Inlet.

### **(2) Information describing the habitat type and quality of marine, estuarine, and freshwater habitats for beluga whales in Cook Inlet:**

A description of beluga habitat should consider what is required for the animal's main life history characteristics across all seasons, which would include foraging, calving, molting, predator avoidance, and movements/migration. However, not all occupied areas and timeframes may be essential for beluga conservation. When establishing the

geographic areas for designation as critical areas it will be necessary to determine which occupied areas are essential for conservation. Only areas that are determined to be essential for conservation should be designated as critical habitat. Also, an assessment of the size of the recovered population is required in that a larger population may require a larger amount of essential habitat than a smaller population.

**(3) Within areas occupied by beluga whales in Cook Inlet, information regarding the physical and biological features that are essential to the conservation of beluga whales in Cook Inlet:**

As noted above, not all occupied areas and timeframes may be essential for beluga conservation. This will require an assessment and determination of physical and biological features (constituent elements) within the identified areas (#2 above) that are “essential” to the conservation of belugas. For example, when designating critical habitat for northern sea otter the U.S. Fish and Wildlife Service is proposing to only designate areas and constituent elements as essential based on the protection they offer from killer whales, which was identified as the primary threat to sea otter conservation and recovery. This approach should be considered.

Physical features that should be considered as elements of habitat include those that (1) influence prey distribution and abundance (i.e., depth, temperature, bathymetry, tides and currents), (2) promote effective avoidance of predators, (3) noise at levels that cause substantive changes in movement patterns or degrade communication among whales associated with feeding and social interactions, and (4) provide for the requirements of new-born calves.

A biological feature that should be considered is the quality and quantity of available prey species. In particular, spatial and temporal aggregations of prey species during the non-ice period, as well as prey species available during winter when energetic demands may be greater for recently weaned juveniles and females that are lactating (and potentially pregnant). Results of ADF&G stomach content analyses indicate that, seasonally, coho and chum salmon are consumed by beluga whales in Cook Inlet more commonly than king salmon. While consumed, the Department has no information at this time to suggest that salmon or smelt abundance in the non-ice period is currently limiting to beluga whales in Cook Inlet. The following summary of the status of Cook Inlet salmon stocks further substantiate our opinion that this is not a factor:

Upper Cook Inlet Overall: The status of salmon stocks in Upper Cook Inlet (UCI) has been, and remains, very optimistic. Since the mid-1990s, Cook Inlet salmon management plans have become more tightly restrictive of commercial fishing and remain very restrictive compared to management in the 1980s. In the last 15 years, harvests ranged from 1.8 to 10.5 million fish, with a 10 year average of 3.7 million fish. The run strength of one species will affect how the Department manages harvests of another species. For example, if a poor run of Chinook salmon occurs in one year, harvests of other species, no matter their run strength, will be reduced due to conservation efforts.

Sockeye Salmon: Sockeye salmon are the most abundant species in UCI. Their harvests have ranged from 1.2 to 9.1 million (record year) in the last 15 years, with an average harvest of 3.2 million fish in the last 10 years. Runs were strong through the early 1990s until 1998. From 1998 to 2001, runs were weaker but generally sufficient to meet escapement goals. Since 2001, runs have rebounded. See Table below. Sockeye salmon runs, when compared decade by decade, have been stable and consistent since 1980.

<b>Decade</b>	<b>Esc.<sup>a</sup></b>	<b>Harvest</b>	<b>Total Run</b>
<b>1970-1979</b>		<b>1,136,304</b>	<b>1,675,929</b>
<b>1980-1989</b>	<b>1,181,250</b>	<b>4,360,213</b>	<b>5,997,673</b>
<b>1990-1999</b>	<b>1,208,899</b>	<b>3,812,910</b>	<b>5,566,874</b>
<b>2000-2006</b>	<b>1,634,007</b>	<b>3,107,936</b>	<b>5,481,415</b>

Pink Salmon: Pink salmon runs in UCI are even-year dominant, with odd year average harvests typically less than 1/7<sup>th</sup> of even-year harvests. Assessments are based largely on commercial fish reports, recreational fishing success, and limited escapement monitoring. Pink salmon are counted as part of programs designed to enumerate Chinook, sockeye, and coho salmon. In general, pink salmon stocks in UCI are maintaining their even-year dominance and continue to return in numbers that reveal that there are no obvious problems with the stock. As an example, the 2006 pink salmon harvest of 404,000 was approximately 50,000 fish greater than the average from the previous five even-year harvests (10 year history).

Chum Salmon: Chum salmon production had a decade of mediocre runs beginning in the mid-1980s, in part due to impacts from fall flooding in the Susitna River Basin in 1986. Chum salmon stocks throughout Southcentral Alaska have mirrored Susitna River chum salmon production, both revealing reductions in abundance from the mid-1980s to the mid-1990s. Beginning in 1995, an improvement in chum salmon production was observed in many areas of Southcentral Alaska, including UCI. Chum salmon runs from 2000 to 2004 were much improved from those realized during the 1990s. The 2002 escapement counts of chum salmon in Susitna River tributary weirs were the highest ever observed for these systems, while the 2001 chum salmon escapement in the Little Susitna River was the second largest ever observed. Therefore, although there is a limited amount of information available for assessing chum salmon stocks in UCI, there are no obvious concerns at this time.

Coho Salmon: UCI's coho salmon stocks generally benefited from excellent production throughout most of the 1980s and early 1990s. However, coho salmon runs in 1997 and 1999 were viewed as mediocre. The 2000 run appeared to be much improved with the 2001 run being even stronger yet, and finally the 2002 run being exceptional, perhaps even a record run. Because coho salmon are strongly dominated by a 4-year cycle, the returns from the 1997 and 1999 brood years occurred primarily in 2001 and 2003. The 2003 run, while not exceptionally strong, still produced escapements nearly three times the level of the 1999 brood year. Since 1997, the drainage-wide coho salmon smolt

emigrations have stabilized and coho salmon runs have also stabilized. Since 2000, Kenai River adult coho salmon runs have been considered good to excellent.

Chinook Salmon: UCI Chinook salmon stocks are relatively stable. The Kenai and Kasilof rivers contain both early and late-run Chinook salmon that support major sport fisheries. The Kenai River stocks are popular with anglers due to ease of access, commercial enterprises to support anglers, and large size of fish in the returns. Both returns are harvested to an unknown degree in a marine recreational fishery in Lower Cook Inlet and late-run fish are also harvested in marine commercial fisheries. Recent escapements for the Kenai River stocks have met or exceeded spawning escapement needs over the past three years. Kasilof River early-run Chinook salmon originate primarily in Crooked Creek and are supplemented by a Department hatchery program. Naturally produced Chinook salmon from this system have met or exceeded spawning escapement needs recently. Late-run Kasilof River Chinook salmon support a developing sport fishery and are harvested in the mixed stock marine sport and commercial fisheries to an unknown degree. Ongoing Department research indicates that inriver sport fishery exploitation is relatively low in comparison to spawning population size. An escapement goal has not been determined for this stock due to insufficient data.

Smelt: Smelt returns to Upper Cook Inlet occur in many of the larger river systems, with particularly large returns to the Susitna and Kenai rivers. Both longfin smelt *Spirinchus thaleichthys* and eulachon *Thaleichthys pacificus* are documented in Cook Inlet. Eulachon begin returning to spawning areas in Cook Inlet generally from mid-May to mid-June and return in quantities large enough to support limited commercial fisheries. Longfin smelt return to Cook Inlet in the fall of the year and are not likely to be targeted for commercial purposes due to much smaller numbers of fish.

**(4) Any special management considerations or protection currently associated with essential physical and biological features within areas occupied by beluga whales in Cook Inlet, such as any land use management plan, a state statute, a municipal ordinance, or other binding local enactment.**

Concern has been raised over the continued development within and along upper Cook Inlet and the cumulative effects on important beluga habitat. Concern is always present, which is why the State tightly regulates the developments for both present and cumulative effects. The State has an extensive and robust permitting program in place to protect beluga habitats and their constituent elements in Cook Inlet. Today's protection standards are no less effective than past standards, and in some cases are superior, resulting in restoration of Cook Inlet habitat. These standards, in combination, should be considered when designating critical habitat and establishing primary constituent elements. Development of primary constituent elements should consider the adequacy of these protection standards. Existing state regulatory protections are summarized in Attachment 1. Many of the municipal governments comprising the coastal communities and communities within the Cook Inlet watershed have also enacted laws and regulations

affecting land use and development and other matters providing important local protection. See <http://sled.alaska.edu/municode.html> for a listing municipal codes of ordinances for Alaskan communities, including those within the Cook Inlet watershed.

**(5) Any specific areas within the range of beluga whales in Cook Inlet that may not qualify for critical habitat designation because they lack essential physical or biological features or may not require special management consideration or protections:**

Once the essential physical and biological features are identified, the relative spatial and temporal importance of those features should be considered to determine if some specific areas within the range of beluga whales in Cook Inlet would not qualify for critical habitat designation. For example, while there is evidence that belugas use river mouths as feeding areas and have been seen in upstream areas, not all tidally influenced upstream areas are equally used. For example, belugas rarely travel upstream to the upper limit of tidal influence in the Little Susitna River. Given this, we suggest consideration be given to defining upstream limits on a site-specific basis based on the best available scientific information. Also, much land and water is currently in protected status within Cook Inlet (Figure 1). These include federal, state, and local lands. These areas should be considered for exclusion as they offer additional levels of protection to beluga whales and their habitats.

**(6) Any specific areas outside the area occupied by Cook Inlet beluga whales that are essential for their conservation:**

We have no information that indicates any specific areas outside of Cook Inlet (i.e., south of a line from Cape Elizabeth to Cape Douglas) are essential for the conservation of beluga whales in Cook Inlet.

**(7) Any specific areas that should be excluded from critical habitat designation because the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat.**

**(8) Any current or planned activities in the range of beluga whales in Cook Inlet and their possible impacts on areas that may qualify as critical habitat;**

**(9) Any economic or other relevant impacts that may result from designating critical habitat, regardless of whether those impacts are attributable co-extensively to other causes, in particular those impacts affecting small entities;**

**(10) Other benefits of excluding or designating a specific area as critical habitat:**

These four statements all relate to economic considerations of the proposed designation of critical habitat. As such we have consolidated our comments on these four statements.

Cook Inlet is the economic hub of Alaska. The majority of the State's population throughout the State depends upon the shipping into and transportation out of Anchorage, and over half of the state's population reside near or engage in the activities described above associated with the Cook Inlet watershed. As a result, many ongoing and proposed

activities/projects could be significantly impacted by the designation of critical habitat and its primary constituent elements. The ESA requires the Service consider the economic and other relevant impacts that would result from the designation of critical habitat.

Identifying which activities could be affected by a critical habitat designation and then estimating the economic impact of additional permitting requirements and stipulations will require more comprehensive evaluation than is possible during this comment period. We provide a list (Table 1) of ongoing and proposed projects the Service should consider as part of this analysis. The table includes primary contacts that should be contacted for further information.

We provide a description of several key activities/projects in Attachment 2. These comments provide only examples and discuss the economics of select activities related to possible critical habitat designation. Information on Alaska communities including chambers of commerce, tourism, military, municipal governments, community profiles, and local area economies can be found at <http://sled.alaska.edu/alaska.html> and <http://sled.alaska.edu/business.html>. More detailed economic analysis will be necessary prior to any designation of critical habitat.

**(11) Potential peer reviewers for proposed critical habitat designations, including persons with biological and economic expertise relevant to the designations:**

The State will provide a list of names upon request. Please contact Doug Vincent-Lang when appropriate.

These conclude our comments. We look forward to working with you as you develop the analysis for designation of critical habitat. If you have any questions regarding these comments or require other information please feel free to contact me. I can be reached by phone at (907) 267-2339 or by email at [douglas.vincent-lang@alaska.gov](mailto:douglas.vincent-lang@alaska.gov).



Doug Vincent-Lang, ESA Coordinator  
Alaska Department of Fish and Game

attachments: Table 1, Figure 1, Attachment 1, and Attachment 2

## **ATTACHMENT 1: State of Alaska Regulatory Authorities**

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The State responsibly manages its wildlife to assure sustainability and has extensive regulatory protections in place to protect the habitat of beluga whales, as well as other fish and wildlife species. In total, the State feels these existing regulatory authorities protect the beluga whales and their habitats in Cook Inlet from potential threats to them. Also, the State has an excellent history of including mitigation measures requested by the U.S. Fish and Wildlife Service, National Marine Fisheries Service (NMFS), and others to protect species listed as threatened or endangered under the Endangered Species Act. Additional details are provided below.

### **ALASKA DEPARTMENT OF FISH AND GAME**

Alaska Statute [16.05.841](#) (Fishway Act) requires that an individual or government agency notify and obtain authorization from the Alaska Department of Fish and Game, Division of Habitat for activities within or across a stream used by fish if Habitat determines that such uses or activities could represent an impediment to the efficient passage of fish. For example, culvert installation; water withdrawals; stream realignment or diversion; dams; low-water crossings; and construction, placement, deposition, or removal of any material or structure below ordinary high water require approval from Habitat.

Alaska Statute 16.05.871 (Anadromous Fish Act) requires that an individual or government agency provide prior notification and obtain permit approval from the Habitat “to construct a hydraulic project or use, divert, obstruct, pollute, or change the natural flow or bed” of a specified waterbody (Quoted portions from AS 16.05.871 (b)). All activities within or across a specified anadromous waterbody and all instream activities affecting a specified anadromous waterbody require approval from Habitat, including construction; road crossings; gravel removal; mining; water withdrawals; the use of vehicles or equipment in the waterway; stream realignment or diversion; bank stabilization; blasting; and the placement, excavation, deposition, or removal of any material.

Some common activities which require a Fish Habitat Permit are stream fords, heavy equipment operated on the ice, water withdrawal, boat launch and dock construction, and culvert placement. Some common activities which don't usually require a permit are hand mining, beaver dam removal by hand and operation of light vehicles on the ice; however, requirements for streambank or streambed disturbance need to be considered. Recreational boating and fishing activities do not require a permit.

The location of specified anadromous waterbodies is contained in the “Catalog of Waters Important for the Spawning Rearing or Migration of Anadromous Fishes.” The Catalog is updated annually after public review. Copies of the Catalog may be viewed [online](#).

In addition to its general responsibilities for the sustained yield management of all fish and wildlife on all lands and waters in the State, the Alaska Department of Fish and

Game (ADF&G) manages State lands designated as Refuges and Critical Habitat Areas within Cook Inlet.

**Alaska Special Areas: Refuges, Sanctuaries and Critical Habitat Areas within or near Cook Inlet managed by ADF&G.**

Name of Special Area	Date Established	Enabling Statute		Date of Management Plan
Kachemak Bay State Critical Habitat Area	1974	AS 16.20.590		1993
Fox River Flats State Critical Habitat Area	1972	AS 16.20.580		1993
Anchor River and Fritz Creek State Critical Habitat Area	1985	AS 16.20.605		1989
Clam Gulch State Critical Habitat Area	1976	AS 16.20.595		None
Kalgin Island State Critical Habitat Area	1972	AS 16.20.575		None
Redoubt Bay State Critical Habitat Area	1989	AS 16.20.625		1994
Trading Bay State Game Refuge	1976	AS 16.20.038		1994
Susitna Flats State Game Refuge	1976	AS 16.20.036		1988
Goose Bay State Game Refuge	1975	AS 16.20.030 (c)		None
Palmer Hay Flats State Game Refuge	1975	AS 16.20.032		2002
Anchorage Coastal Wildlife Refuge	1977/1981	AS 16.20.031		1991
McNeil River State Game Refuge	1991	AS 16.20.150		2008
McNeil River State Game Sanctuary	1977/1991	AS 16.20.160		2008

The ADF&G special area management plans are available at:  
<http://www.wildlife.alaska.gov/index.cfm?adfg=refuge.main>

The ADF&G participates with other State agencies in Oil Spill Contingency Plans. The Alaska Department of Environmental Conservation (ADEC) requires all vessels transporting oil and hazardous substances within the State of Alaska to have a contingency plan in the event of a spill. Each operator is required to follow the ADEC format as described in 18 AAC 75, Article 4 which is located at the following link:  
[http://www.dec.state.ak.us/spar/statutes\\_regs.htm#regs75](http://www.dec.state.ak.us/spar/statutes_regs.htm#regs75)

In addition to industry contingency plans, ADEC and other agencies, including ADF&G, formalized regional plans to ensure consistency. Southeast Alaska has its own regional plan entitled ‘The Southeast Alaska Subarea Contingency Plan for oil and hazardous substance spills and releases’. This regional plan is located at :  
[www.dec.state.ak.us/spar/perp/plans/scp\\_se.htm](http://www.dec.state.ak.us/spar/perp/plans/scp_se.htm). The industry contingency plans are a way that ADEC can ensure that the company is prepared and thinking in advance before

they travel in Alaska waters. ADF&G reviews relevant industry plans with a focus on the protection of fish and wildlife.

### **Department of Natural Resources** ***Office of Project Management and Permitting***

The Office of Project Management and Permitting (OPMP) functions under AS 38.05.020(b)(9) which allows the Commissioner of DNR to coordinate permitting activities for all large resource development projects. OPMP's goal is to ensure that all aspects of a large project are considered during a single review and approval process. OPMP is currently coordinating the permitting of the several projects in Cook Inlet (Pebble Project, Chitna Coal Project, Port MacKenzie Rail Extension, and the Knik Arm Crossing).

OPMP assigns a project manager to serve as the primary contact for a large project. The project manager coordinates the permitting activities of the state team, the Large Project Team, assigned to work on the project. The Large Project Team is an interagency group coordinated by OPMP that works cooperatively with project applicants, federal agencies, and the public to ensure that projects are designed, operated, and reclaimed in a manner consistent with the public interest. The project manager's primary responsibility is to ensure a coordinated process with minimum duplication of efforts. This often involves tailoring the process to fit specific project needs.

The goal of the state's Large Project Team is to coordinate the timing and completion of the numerous permits. The team reviews all the complex technical documents generated during the process and provides coordinated comments. The team also coordinates stakeholder involvement and provides a single point of contact for the public. The team provides the public, agencies and the applicant the opportunity to view the project as a whole.

The requirement for the federal authorizations for large development projects usually triggers an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). The State would typically request cooperating agency status in the development of the EIS, seeking to dovetail the state's permitting process with the EIS process. The Large Project Team also coordinates, to the extent possible, with local governments.

### ***Division of Coastal and Ocean Management***

The Division of Coastal and Ocean Management (DCOM) facilitates the implementation of wildlife conservation measures at several distinct levels during land and resource planning processes as well as at the level of individual project planning and development. Below is a bulleted list of these responsibilities of DCOM:

1. Pre-application assistance & meetings. DCOM is tasked with scheduling meetings between a prospective developer and the agency personnel that would

be reviewing, critiquing and, ultimately, writing permits to authorize a given development project. These meetings provide an invaluable opportunity for industry to meet face-to-face with agency scientists and resource managers. Oftentimes ESA issues are brought to an applicant's attention at these meetings. Thus, when a developer is made aware of potential wildlife conflicts and/or potential adverse impacts of their planned project ahead of time, the finalized plan of operation or facility footprint is substantially modified before permit applications are even filed. At these meetings, prospective applicants are made aware, if they are not already, of the need to design and site facilities so as to be consistent with statewide standards and district enforceable policies. Applicants are also made aware of the (oftentimes) many distinct special-interest groups that need to be "kept in the loop" for the planning/approval process. This list typically includes subsistence oversight groups, Native Tribes, Native Councils, commercial or recreational fishing interests, environmental groups, etc.

2. Requirements/Standards for what review materials need be submitted. Applicants need to provide DCOM and review participants with:
  - a. completed Coastal Project Questionnaire;
  - b. map(s) identifying the location of the project and adjacent facilities, diagrams, technical data, and other relevant material;
  - c. description of any man-made structures or natural features that are at or near the project site;
  - d. an evaluation of how the proposed project is consistent with the state standards and with any applicable district enforceable policies, sufficient to support the consistency certification;

These materials are of paramount importance in assisting agency personnel as well as the public review a given project for its potential impacts to coastal uses and resources. It is partially with these materials that a review participant can suggest alternative measures that will improve a proposed development project. Similarly the requirement imposed by the coastal consistency review process for federal agencies to submit consistency evaluations along with draft plans (e.g., OCS oil & gas leasing plans) enables a more thorough review and comment adjudication.

3. Public process/ public review. Most state and federal agency authorizations (permits) go through both public and agency review processes often coordinated by DCOM. This fulfills many agencies' responsibility for posting/distributing public notice. It also provides a key tool wherein USFWS, ADF&G, state agency biologists, the public, and the coastal district can raise attention to scientific, social and/or environmental concerns relative to beluga habitat or beluga population dynamics in the context of a given proposed plan or project. Plan adoption and/or individual authorizations for a given project must, through the coastal consistency review process that is adjudicated by DCOM, be deemed

consistent with Alaska Coastal Management Program (ACMP) standards before said permit is issued or plan is adopted.

4. DCOM assists coastal districts develop and adopt Program Plans and District Enforceable Policies. According to statewide standards of the ACMP as well as the local enforceable policies, the ACMP review process functions as a tool for adding restrictions or mitigating measures (in the form of Alternative Measures) to the authorizations that are issued.
5. DCOM works to act as a facilitator to attempt to resolve conflicts among the resource agencies, an affected coastal resource district, and/or an applicant-- before, during, or after a project is permitted.
6. Where the specific aspects of an activity that would otherwise be subject to authorization by the Alaska Department of Environmental Conservation (DEC) are not subject to that department's authorization because the activity is either a federal activity or is located on federal land or the OCS, DEC can review, comment on, and/or add alternative measures to said activity *only* through the ACMP. Thus, the ACMP provides a very valuable role in its being the only venue for the state to comment on, allow, disallow, or make modifications to certain federal actions or private activities located on federal land or the OCS.
7. Specific Statewide standards that may have bearing on conserving beluga whales and their habitat include:
  - **11 AAC 112.230. Energy facilities.** (a)(1) The siting and approval of major energy facilities by districts and state agencies must be based, to the extent practicable, to minimize adverse environmental and social effects while satisfying industrial requirements;
  - **11 AAC 112.230. Energy facilities.** (a)(2) The siting and approval of major energy facilities ... must be based, to the extent practicable, to be compatible with existing and subsequent adjacent uses and projected community needs;
  - **11 AAC 112.230. Energy facilities.** (a)(11) The siting and approval of major energy facilities ... must ... minimize the probability, along shipping routes, of spills or other forms of contamination that would affect fishing grounds, spawning grounds, & other biologically productive or vulnerable habitats, including marine mammal rookeries and hauling out grounds...
  - **11 AAC 112.230. Energy facilities.** (a)(12) The siting and approval of major energy facilities ... must ... allow for the free passage and movement of fish and wildlife with due consideration for historic migratory patterns;
  - **11 AAC 112.230. Energy facilities.** (a)(13) Major energy facilities should be sited so that areas of particular ... environmental, or cultural value ... will be protected;
  - **11 AAC 112.270. Subsistence.** (a) A project within a subsistence use area designated by the department or under 11 AAC 114.250(g) must avoid or minimize impacts to subsistence uses of coastal resources. (b) For a

project within a subsistence use area designated under 11 AAC 114.250(g), the applicant shall submit an analysis or evaluation of reasonably foreseeable adverse impacts of the project on subsistence use as part of (1) a consistency review packet submitted under 11 AAC 110.215; and (2) a consistency evaluation under 15 C.F.R. 930.39, 15 C.F.R. 930.58, or 15 C.F.R. 930.76.

- **11 AAC 112.300. Habitats.** (b) (2) estuaries must be managed to avoid, minimize, or mitigate significant adverse impacts to
  - adequate water flow and natural water circulation patterns; and
  - competing uses such as commercial, recreational, or subsistence fishing, to the extent that those uses are determined to be in competition with the proposed use;
- **11 AAC 112.300. Habitats.** (b) (3) wetlands must be managed to avoid, minimize, or mitigate significant adverse impacts to water flow and natural drainage patterns;
- **11 AAC 112.300. Habitats.** (b) (8) rivers, streams, and lakes must be managed to avoid, minimize, or mitigate significant adverse impacts to
  - natural water flow;
  - active floodplains; and
  - natural vegetation within riparian management areas; and

### ***Division of Mining, Land and Water***

ADNR Area Plans determine management intent, land use designations, and management guidelines that apply to all State lands in the planning area. A list of Threatened and Endangered species is provided in each State Area Plan, and the NMFS will be consulted on questions that involve endangered species.

### ***Division of Oil and Gas***

AS 38.05.035(e) and the departmental delegation of authority provide the director of the Division of Oil and Gas (“director”), with the authority to impose conditions or limitations, in addition to those imposed by statute, to ensure that a resource disposal is in the state’s best interests. Consequently, to mitigate the potential adverse social and environmental effects of specific lease related activities, DO&G has developed mitigation measures and will condition plans of operation, exploration, or development and other permits based on these mitigation measures.

Lessees must obtain approval of a detailed plan of operations from the director before conducting exploration, development, or production activities. A plan of operations must identify the sites for planned activities and the specific measures, design criteria, construction methods and operational standards to be employed to comply with the restrictions listed below. It must also address any potential geologic hazards that may exist at the site.

These measures were developed after considering terms imposed in earlier competitive lease sales and comments and information submitted by the public, local governments, environmental organizations, and other federal, state, and local agencies. Additional measures will likely be imposed when lessees submit a proposed plan of operations.

Lessees must comply with all applicable local, state and federal codes, statutes and regulations, as amended, as well as all current or future ADNR area plans and recreation rivers plans; and ADF&G game refuge plans, critical habitat area plans, and sanctuary area plans within which a lease area is located. Lease activities must be consistent with the enforceable policies of the Alaska Coastal Management Program, including statewide standards and the enforceable policies of an affected coastal district, as amended.

The director may grant exceptions to these mitigation measures. Exceptions will only be granted upon a showing by the lessee that compliance with the mitigation measure is not practicable or that the lessee will undertake an equal or better alternative to satisfy the intent of the mitigation measure. Requests and justifications for exceptions must be included in the plan of operations. The decision whether to grant an exception will be made during the public review of the plan of operations.

Except as indicated, the mitigation measures do not apply to geophysical exploration on state lands; geophysical exploration activities are governed by 11 AAC 96.

Agency abbreviations are:

<u>Abbreviation</u>	<u>Agency Name</u>
ADF&G	Alaska Department of Fish and Game
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
DMLW	Division of Mining, Land, and Water (ADNR)
DO&G	Division of Oil and Gas (ADNR)
NMFS	National Marine Fisheries Service
SHPO	State Historic Preservation Office (ADNR)
USFWS	U.S. Fish and Wildlife Service

## **A. Mitigation Measures**

### **1. Facilities and Operations**

a) A plan of operations must be submitted and approved before conducting exploration, development or production activities, and must describe the lessee's efforts to minimize impacts on residential, commercial, and recreational areas, Native allotments and subsistence use areas, and adjacent private lands. At the time of application, lessee must submit a copy of the proposed plan of operations to all surface owners whose property will be entered.

b) Facilities must be designed and operated to minimize sight and sound impacts in areas of high residential, commercial, recreational, and subsistence use and important wildlife habitat. Methods may include providing natural buffers and screening to conceal

facilities, sound insulation of facilities, or by using alternative means approved by the director, in consultation with ADF&G.

c) The siting of onshore facilities, other than roads, docks, utility or pipeline corridors, or terminal facilities will be prohibited within one-half mile of the mean high water of Cook Inlet, except where land use plans classify an area for development, or established usage and use history show development. The siting of facilities other than docks, roads, utility, and pipeline crossings will also be prohibited within 500 feet of all fish bearing streams and waterbodies and 1,500 feet of all current surface drinking water sources.

Additionally, to the extent practicable, the siting of facilities will be prohibited within one-half mile of the banks of the Harriet, Alexander, Lake, Deep, and Stariski creeks, and the Drift, Big, Kustatan, McArthur, Chuitna, Lewis, Theodore, Beluga, Susitna, Little Susitna, Kenai, Kasilof, Ninilchik, and Anchor rivers. Facilities may be sited within these buffers if the lessee demonstrates to the satisfaction of the director, in consultation with ADF&G, that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally preferred. Road, utility, and pipeline crossings must be consolidated and aligned perpendicular or near perpendicular to watercourses.

d) Impacts to identified wetlands must be minimized to the satisfaction of the director, in consultation with ADF&G and ADEC. The director will consider whether facilities are sited in the least sensitive areas. Further, all activities within wetlands require permission from the U.S. Army Corps of Engineers (see Lessee Advisories).

e) Exploration activities must be supported by air service, an existing road system or port facility, ice roads, or by off-road vehicles that do not cause significant damage to the vegetation or ground surface. Construction of temporary drill pads, airstrips, and roads may be allowed. Construction of permanent roads may be allowed upon approval by the director. Unrestricted surface travel may be permitted by the director and DMLW, if an emergency condition exists.

f) With the exception of drill pads, airstrips, and roads permitted under A1e, exploration facilities must be consolidated, temporary, and must not be constructed of gravel. Use of abandoned gravel structures may be permitted on a case-by-case basis.

g) Pipelines must utilize existing transportation corridors and be buried where conditions permit. Pipelines and gravel pads must be designed to facilitate the containment and cleanup of spilled fluids. Pipelines, flowlines, and gathering lines must be designed and constructed to assure integrity against climatic conditions and geologic hazards. In areas with above ground placement, pipelines must be designed, sited, and constructed to allow for the free movement of wildlife. Where practicable, pipelines must be located on the upslope side of roadways and construction pads, unless DMLW determines that an alternative site is environmentally acceptable.

h) Pipelines that must cross marine waters will be constructed beneath the marine waters using directional drilling techniques, unless the director, in consultation with ADF&G

and the local borough and Coastal Resource Service Areas, approves an alternative method based on technical, environmental, and economic justification. Offshore pipelines must be located and constructed to prevent obstruction to marine navigation and fishing operations.

i) Gravel mining sites required for exploration and development activities will be restricted to the minimum necessary to develop the field efficiently and to minimize environmental damage. Gravel mine sites required for exploration activities must not be located within an active floodplain of a watercourse unless DMLW, after consultation with ADF&G, determines that there is no practicable alternative, or that a floodplain site would be compatible with fish and wildlife habitat after mining operations are completed and the site is closed.

## **2. Habitat, Fish, and Wildlife**

a) Detonation of explosives will be prohibited in open water areas of fish bearing streams and lakes. Explosives must not be detonated beneath, or in close proximity to, fish-bearing streams and lakes if the detonation of the explosive produces a pressure rise in the water body of greater than 2.7 pounds persquare- inch, or unless the water body, including its substrate, is solidly frozen. Detonation of explosives within or in close proximity to a fish spawning bed during the early stages of egg incubation must not produce a peak particle velocity greater than 0.5 inches per second. Blasting criteria have been developed by ADF&G and are available from ADF&G upon request. The location of known fish bearing waters within the project area can be obtained from ADF&G.

b) Compaction or removal of snow cover overlying fish bearing water bodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, ice and/or snow bridges may be required.

c) Removal of water from fishbearing rivers, streams and natural lakes shall be subject to prior written approval by DMLW and ADF&G. Water intake pipes used to remove water from fish bearing waterbodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Screen mesh size shall be no greater than 1 mm (0.04 inches), unless another size has been approved by ADF&G. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.4 feet per second, unless an alternative velocity has been approved by ADF&G. Screen material must be corrosion resistant, and must be adequately supported to prevent excessive sagging which could result in unusable intake surface. The intake structure must be designed and installed to avoid excessive fouling from floating debris, and a minimum of eight square feet of effective wetted screen surface must be provided for each multiple of a 450-gallon per minute (one cubic foot per second) pumping rate. The pump intake opening must be placed equidistant from all effective wetted screen surfaces.

d) Surface entry will be prohibited in parcels that are within the Kenai River Special Management Area. Surface entry, other than access, will be prohibited on state lands within the Kenai National Wildlife refuge. Lessees are prohibited from placing drilling rigs and lease-related facilities and structures within an area near the Kenai River

composed of: all land within Section 36 in T6N, R11W that is located south of a line drawn from the protracted NE corner to the protracted SW corner of the section; all land within the western half of Section 31 in T6N, R10W and Section 6 in T5N, R10W; and all land within Section 1 in T5N, R11W.

e) Surface entry into the critical waterfowl habitat along the Kasilof River is prohibited. Directional drilling from adjacent sites may be allowed.

f) Surface entry will be prohibited within one-quarter mile of trumpeter swan nesting sites between April 1 and August 31. The siting of permanent facilities, including roads, material sites, storage areas, powerlines, and above ground pipelines will be prohibited within one-quarter mile of known nesting sites. Trumpeter swan nesting sites will be identified by ADF&G at the request of the lessee.

g) The director, in consultation with ADF&G, shall restrict or modify lease related activities if scientific evidence documents the presence of Steller's eiders from the Alaska breeding population in the lease area and it is determined that oil and gas exploration and development will impact them or their over-wintering habitat in the near-shore waters of Cook Inlet.

h) The director, in consultation with ADF&G, may impose seasonal restrictions on activities located in and adjacent to important waterfowl and shorebird habitat during the plan of operations approval stage.

### **Bears**

i) Lessees are required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan shall include measures to:

- i. minimize attraction of bears to facility sites, including garbage and food waste;
- ii. organize layout of buildings and work areas to minimize interactions between humans and bears such as including the use of electric fencing;
- iii. warn personnel of bears near or on facilities and the proper actions to take;
- iv. if authorized, deter bears from the drill site;
- v. provide contingencies in the event bears do not leave the site;
- vi. provide for proper storage and disposal of materials that may be toxic to bears; and
- vii. document and communicate the sighting of bears onsite or in the immediate area to all shift employees.

j) Before commencement of any activities, lessees shall consult with ADF&G to identify the locations of known bear den sites that are occupied in the season of proposed activities. Exploration and development activities started between November 15 and March 31 may not be conducted within onhalf mile of known occupied brown bear dens, unless alternative mitigation measures are approved by the ADF&G. A lessee who encounters an occupied den not previously identified by ADF&G must report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. Mobile activities shall avoid such discovered occupied dens by one-half mile unless alternative mitigation

measures are approved by DO&G with concurrence from ADF&G. Non-mobile facilities will not be required to be relocated.

k) Recognizing the importance of sufficient vegetative cover and access by Kenai Peninsula brown bears feeding at streams, the director, in consultation with ADF&G, may require lessees to locate exploration and development facilities beyond the 500-foot buffer along anadromous streams during the plan of operations approval stage, except as provided in A1c.

### **Caribou**

l) Surface entry within the core calving area of the Kenai Lowlands Caribou Herd is prohibited, except that surface entry for seismic exploration will be allowed from October 16 to March 31.

m) Exploration and development activities will be restricted or prohibited between April 1 and October 15 within the core summer habitat of the Kenai Lowlands Caribou Herd, except that maintenance and operation of production wells will be allowed year-round. Permanent roads, or facilities other than production wells, will also be restricted or prohibited within this area. Facilities within the core summer habitat of the Kenai Lowlands Caribou Herd that require year-round access must be located in forested areas, where practical.

n) Pipelines must be buried within the core summer habitat of the Kenai Lowlands Caribou Herd.

o) The director, in consultation with ADF&G, may impose seasonal restrictions on activities located in, or requiring travel through or overflight of, important moose or caribou calving and wintering areas during the plan of operations approval stage.

### **Beluga Whales**

p) No permanent or temporary oil and gas exploration or development may occur within High Value/High Sensitivity (Type 1) beluga whale habitat areas, unless it occurs on upland areas (above Mean Higher Water datum). Type 1 habitat areas include the following tracts: 320-334, 391-409, 410, 462, 464-475, 476-481, 483, 484, 485, 486, 493, 494, 497, 498, 522, 524-537, 538, 539, 540, 541, 542, 543, 544, 547- 552, 559, 575-577, 579, 581, 582, 585, 586, 590, 593, 594, 598, 616-618, 620-623, 627, 655-658, and 662.

q) The director will assess oil and gas-related activities within all High Value (Type 2) beluga whale habitat areas on a case-by-case basis. No permanent surface entry or structures are allowed, and temporary activities and structures, for example exploration drilling, will only be allowed between November 1 and April 1 of each year, unless it occurs on upland areas, within the following tracts: 021, 022, 126, 127, 129- 132, 161, 162, 175, 177, 211, 218, 257, 301, 302, 373, 376, 377, and 384.

r) The director will assess oil and gas-related activities within the remaining tracts (Type 3 habitat areas) on a case-by-case basis.

### **3. Subsistence, and Other Fish and Wildlife Uses**

a) Lease-related use will be restricted when DO&G determines it is necessary to prevent unreasonable conflicts between lease-related activities and subsistence, and commercial, sport, personal use, and educational harvest activities. In enforcing this term DO&G, during review of plans of operation, will consult with other agencies, the affected local borough(s) and the public to identify and avoid potential conflicts. In order to avoid conflicts with subsistence, commercial, sport and educational harvest activities, restrictions may include alternative site selection, requiring directional drilling, seasonal drilling restrictions, and other technologies deemed appropriate by DO&G.

### **4. Fuel, Hazardous Substances, and Waste**

a) Secondary containment (see definitions) shall be provided for the storage of fuel or hazardous substances.

b) Containers with an aggregate storage capacity of greater than 55 gallons which contain fuel or hazardous substances shall not be stored within 100 feet of a waterbody, or within 1,500 feet of a current surface drinking water source.

c) During equipment storage or maintenance, the site shall be protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner or other suitable containment mechanism.

d) During fuel or hazardous substance transfer, secondary containment or a surface liner must be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to 5 gallons, must be on hand during any transfer or handling of fuel or hazardous substances. Trained personnel shall attend transfer operations at all times.

e) Vehicle refueling shall not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.

f) All independent fuel and hazardous substance containers shall be marked with the contents and the lessee's or contractor's name using paint or a permanent label.

g) A freshwater aquifer monitoring well, and quarterly water quality monitoring, may be required down gradient of a permanent above-ground liquid hydrocarbon storage facility.

h) Waste from operations must be reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated or disposed of at an approved site in accordance with 18 AAC 60. (See also Section B2, below.)

i) New solid waste disposal sites will not be approved or located on state property during the exploratory phase. Exceptions may be provided for drilling waste if the facility will comply with the applicable provisions of 18 AAC 60.

j) Wherever practicable, the preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. Other methods of disposal shall be allowed only upon approval by the director, in consultation with ADEC and ADF&G.

## **5. Access**

a) Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. Areas of restricted access must be identified in the plan of operations. Lease facilities and operations shall not be located so as to block access to or along navigable or public waters as defined in AS 38.05.965.

## **6. Prehistoric, Historic, and Archeological Sites**

a) Before the construction or placement of any gravel, or other structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archeological sites within the area affected by an activity. The inventory must include consideration of literature provided by the affected borough and local residents; documentation of oral history regarding prehistoric and historic uses of such sites; evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places; and site surveys. The inventory must also include a detailed analysis of the effects that might result from the activity.

b) The inventory of prehistoric, historic, and archeological sites must be submitted to the director, and to DPOR Office of History and Archaeology, who will coordinate with the affected borough for review and comment. If a prehistoric, historic, or archeological site or area could be adversely affected by a lease activity, the director, after consultation with DPOR Office of History and Archaeology and the affected borough, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.

c) If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee must report the discovery to the director as soon as possible. The lessee must make reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the director, after consultation with DPOR Office of History and Archaeology and the affected borough, has directed the lessee as to the course of action to take for its preservation.

## **7. Local Hire, Communication, and Training**

a) Lessees are encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. Lessees shall submit, as part of the plan of operations, a proposal detailing the means by which the lessee will comply with the measure. The proposal must include a description of the operator's plans for partnering with local communities to recruit, hire, and train local and Alaska residents and contractors. The lessee is encouraged, in formulating this proposal,

to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.

b) A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.

c) A plan of operations application must include a training program for all personnel including contractors and subcontractors. The program must be designed to inform each person working on the project of environmental, social, and cultural concerns that relate to that person's job. The program must use methods to ensure that personnel understand and use techniques necessary to preserve geological, archeological, and biological resources. In addition, the program must be designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles in areas where they will be operating.

## **8. Definitions**

***Facilities*** means any structure, equipment, or improvement to the surface, whether temporary or permanent, including, but not limited to, roads, pads, pits, pipelines, power lines, generators, utilities, airstrips, wells, compressors, drill rigs, camps and buildings.

***Hazardous substance*** means: (A) an element or compound that, when it enters into or on the surface or subsurface land or water of the state, presents an imminent and substantial danger to the public health or welfare, or to fish, animals, vegetation, or any part of the natural habitat in which fish, animals, or wildlife may be found; or (B) a substance defined as a hazardous substance under 42 U.S.C. 9601 - 9657 (Comprehensive Environmental Response, Compensation, and Liability Act of 1980); "hazardous substance" does not include uncontaminated crude oil or uncontaminated refined oil; (AS 46.09.900).

***Identified wetlands*** are those areas that have been identified as wetlands by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.1

***Minimize*** means to reduce adverse impacts to the smallest amount, extent, duration, size, or degree reasonable in light of the environmental, social, or economic costs of further reduction.

***Plan of operations*** means a lease Plan of operations under 11 AAC 83.158 and a unit Plan of operations under 11 AAC 83.346.

***Practicable*** means feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the standard.

***Secondary containment*** means an impermeable diked area or portable impermeable containment structure capable of containing 110 percent of the volume of the largest independent container. Double walled tanks do not qualify as Secondary Containment unless an exception is granted for a particular tank.

*Temporary* means no more than 12 months.

## **B. Other Regulatory Requirements (Lessee Advisories)**

Lessees must comply with all applicable local, state and federal codes, statutes and regulations, as amended. Lessee advisories alert lessees to additional restrictions that may be imposed at the permitting stage of a proposed project or activity where entities other than DO&G have regulatory, permitting, or management authority.

### **1. Alaska Department of Natural Resources,**

a) Pursuant to AS 46.40, projects are required to comply with all policies and enforceable standards of the Alaska Coastal Management Program, including the District Coastal Management Plans.

b) Lessees must include in their seismic permit applications a plan for notifying the public of their activities (11 AAC 96).

c) Forest clearing for seismic exploration must have prior approval by DO&G in consultation with the Division of Forestry and ADF&G.

d) Removal of gravel from state land must have prior approval from DMLW. Lessees must submit a material sale application (AS 38.05.110-120, AS 38.05.810, 11 AAC 71.045) as well as a development plan, environmental risk questionnaire, and Alaska Coastal Management Plan questionnaire. Applicants are required on state, federal, municipal, and private land to submit a reclamation plan or letter of intent per AS 27.19.030-050.

### **2. Alaska Department of Environmental Conservation**

a) Pursuant to AS 46.04.030, lessees are required to have an approved oil discharge prevention and contingency plan (C-Plan) before commencing operations. The plan must include a response action plan to describe how a spill response would occur, a prevention plan to describe the spill prevention measures taken at the facility, and supplemental information to provide background and verification information.

b) Pursuant to state regulations administered by ADEC and the Clean Air Act administered by EPA, lessees are required to obtain air quality permits before construction and operation. The permits will include air quality monitoring, modeling, and emission control obligations.

c) Unless authorized by an ADEC permit, surface discharge of reserve pit fluids and produced waters is prohibited. 1 *Wetlands* means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR Parts 122.2, 230.3, and 232.2).

d) Unless authorized by National Pollutant Discharge Elimination System or state permits, disposal of wastewater into freshwater bodies is prohibited.

### **3. Alaska Department of Fish and Game**

a) Under the provisions of Title 16 of the Alaska Statutes, the measures listed below may be imposed by ADF&G below the ordinary high water mark to protect designated anadromous waterbodies and to ensure the free and efficient passage of fish in all fish-bearing waterbodies. Specific information on the location of anadromous water bodies in and near the area may be obtained from ADF&G.

i) Alteration of riverbanks may be prohibited.

ii) The operation of equipment, excluding boats, in open water areas of rivers and streams may be prohibited.

iii) Bridges or non-bottom founded structures may be required for crossing fish spawning and important rearing habitats.

iv) Culverts or other stream crossing structures must be designed, installed, and maintained to provide free and efficient passage of fish.

b) Removal of water from fish-bearing water bodies is subject to the provisions of Regulations for Appropriation and Use of Water (11 AAC 93.035 - 11 AAC 93.147).

c) The use of explosives for seismic activities with a velocity of greater than 3000 feet-per-second in marine waters is prohibited.

### **Game Refuges and Critical Habitat Areas**

d) Management of legislatively designated state game refuges and critical habitat areas is the co-responsibility of ADF&G, per AS 16.20.050-060 and AS 16.20.500-530, and ADNR, per AS 38.05.027. For activities occurring within a refuge or critical habitat area, the lessee will be required to obtain permits from both ADNR and ADF&G. The following requirements are established by, and exceptions may only be granted by, ADF&G.

e) Five state game refuges (SGR) and four critical habitat areas (CHA) are located within or partially within the Cook Inlet lease sale area: Goose Bay SGR, Palmer Hay Flats SGR, Anchorage Coastal Wildlife Refuge, Susitna Flats SGR, Trading Bay SGR, Redoubt Bay CHA, Kalgin Island CHA, Clam Gulch CHA, and Anchor River and Fritz Creek CHA. Operations within these refuges and critical habitat areas must comply with the terms and conditions of the

lease sale, the regulations contained within 5 AAC 95, and the measures listed below.

i. Surface entry for drilling and above ground lease-related facilities and structures will be prohibited within the Palmer Hay Flats SGR, Anchorage Coastal Wildlife Refuge, Clam Gulch CHA, Anchor River and Fritz Creek CHA, within the core Tule goose and trumpeter swan nesting and molting corridors along the Big, Kustatan, and McArthur rivers in the Trading Bay SGR and Redoubt Bay CHA, on tidelands and wetlands in the Goose Bay SGR and Kalgin Island CHA and within the primary shorebird area in Susitna Flats SGR, Trading Bay SGR, and Redoubt Bay CHA.

Surface entry may be allowed on uplands within the Goose Bay SGR and Kalgin Island CHA; and surface entry for seismic surveys and similar temporary activities may be allowed in all of these areas, consistent with the Special Area regulations and applicable Special Area management plans. Directional drilling from adjacent sites may be allowed. Similar provisions will be imposed by the DO&G to protect primary shorebird habitat in Redoubt Bay south of the CHA.

ii) Exploration, development, and major maintenance within important Tule goose and trumpeter swan habitat in Trading Bay SGR, Redoubt Bay CHA, and Susitna Flats SGR, and the primary waterfowl area above mean high tide within the Susitna Flats SGR and Trading Bay SGR will be allowed only between November 1 and March 31, unless an extension is approved by ADF&G and DO&G. Routine maintenance and emergency repairs will be permitted on a year-round basis during the production phase. A detailed plan describing routine maintenance activities to be conducted between April 1 and October 31 must be submitted to ADF&G and DO&G for review and approval.

iii) Gravel pads and wellheads are the only above ground structures that will be allowed within the primary waterfowl area above mean high tide in the Susitna Flats SGR and the Trading Bay SGR and important Tule goose and trumpeter swan habitat in the Trading Bay SGR, Redoubt Bay CHA and Susitna Flats SGR. Gravel roads will not be allowed in a SGR or CHA during exploration.

iv) (a) aircraft flying over the primary shorebird habitat within Susitna Flats SGR, Trading Bay SGR and Redoubt Bay CHA should maintain a minimum altitude of 1,500 feet above ground level or a horizontal distance of 1 mile. (b) Aircraft flying over Goose Bay SGR and Palmer Hay Flats SGR, the primary waterfowl habitat above mean high tide within Susitna Flats and Trading Bay SGR, and the core Tule goose and trumpeter swan molting and nesting corridors in Trading Bay SGR and Redoubt Bay CHA should maintain a minimum altitude of 1,500 feet above ground level or a horizontal distance of 1 mile from April 1 to October 31. Human safety will take precedence over this provision.

v) Construction, operation, and maintenance activities shall minimize the visual, biological, and physical impacts to the SGR or CHA.

vi) Surface discharge of produced waters will be prohibited.

vii) Disposal of drilling mud and cuttings will be allowed only at upland sites approved by the DO&G and ADF&G, after consultation with DMLW and ADEC.

viii) Facilities must be designed to minimize the risk of spills or fires resulting from vandalism or accidents.

#### **4. Alaska Department of Labor and Workforce Development**

a) The lessee shall facilitate Alaska resident hire monitoring by reporting project wages on a quarterly basis for each individual employed by the lessee in the lease area, through

electronic unemployment insurance reporting, and by requiring the same of the lessee's contractors and subcontractors.

### **5. U.S. Army Corps of Engineers**

a) A U.S. Army Corp of Engineers permit is required when work is anticipated on, in, or affects navigable waters or involves wetland-related dredge or fill activities. A Section 10 Permit is required for construction, excavation, or deposition of materials in, over, or under navigable waters, or for any work which would affect the course, location, condition, or capacity of navigable waters (U.S.C. 403). Oil and gas activities requiring this type of permit include, but are not limited to, exploration drilling from a jackup drill rig and installation of a production platform. A Section 404 Permit is required for the discharge of dredged and fill material into waters and wetlands of the United States (33 U.S.C. 1344). The process and concerns are similar for both permits and, at times, both may be required.

### **6. U.S. Fish and Wildlife Service and National Marine Fisheries Service**

a) The lessee is advised that the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) protects the following endangered or threatened species and candidate species for listing that may occur in the lease sale area:

Common Name Status

Fin whale Endangered

Steller sea lion (western stock) Endangered

Humpback whale Endangered

Beluga whale in Cook Inlet Endangered

Steller's eider (Alaska breeding population) Threatened

Migratory birds, sea otters, polar bears, and Pacific walrus are managed by the U.S. Fish and Wildlife Service. The National Oceanic and Atmospheric Administration, National Marine Fisheries Service is responsible for management of all other marine mammals.

b) NMFS, USFWS, and ADF&G will continue annual monitoring efforts to further delineate the presence and distribution of species administered under the ESA and Marine Mammal Protection Act (MMPA). The lessee is advised to annually acquire updated information from these agencies.

c) The USFWS has determined that oil and gas exploration and development activities within 3 miles seaward or within one-half mile landward of the eastern shore of Cook Inlet, from Clam Gulch to the southern bounds of the lease sale area, are likely to adversely affect (take) Steller's eiders. Each operator is advised to consult with the USFWS well in advance of any activities in this area.

d) The lessee is advised that off-shore activity (particularly seismic geophysical surveys) may result in the taking of beluga whales and other marine mammals. Such taking is prohibited by the federal MMPA unless otherwise authorized. The incidental taking of marine mammals may be authorized under the MMPA, and each operator should be advised to discuss this matter with NMFS well in advance of any geophysical survey activity.

e) The lessee is advised that the Cook Inlet beluga whale is listed as a depleted stock under the MMPA. In October 2008, NMFS listed the whale population as endangered under the ESA; critical habitat designations are pending. The lessee is advised to review the Federal Register and contact NMFS for additional information.

f) The lessee is advised that the Magnuson-Stevens Fishery Conservation and Management Act requires identification of Essential Fish Habitat (EFH) for all species managed under a federal Fisheries Management Plan. Subsequent exploration and/or development activities associated with the lease sale may be subject to consultation under EFH. EFH information, consultation, guidance, and species life history information are available on the NMFS website at <http://www.fakr.noaa.gov/habitat>.

g) The lessee is advised that the description of the techniques used to drill and conduct seismic operations should be thorough and assess potential effects of fish and their spawning substrate, migratory corridors, and over-wintering areas.

h) The lessee is advised that the response technologies and geographic response strategies have been prepared for Cook Inlet by state and federal planning teams in which NMFS has participated. However, the application of these plans in fast-moving Cook Inlet waters, especially during ice-laden times, could prove difficult. Further, mechanical recovery in estuaries, anadromous streams, and adjacent continuous wetlands can potentially disrupt these habitats and degrade water quality conditions. Thus, recovery and containment plans will need to address habitat effects within the site and areas where tidal currents may deposit or entrain spilled product. These assessments are needed before development.

i) Lessees are advised of the need to comply with the Migratory Bird Treaty Act (MBTA; 16 U.S.C. 703) which is administered by the USFWS. Under the MBTA, it is illegal to "take" migratory birds, their eggs, feathers or nests. "Take" is defined (50 CFR 10.12) to include "pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting." The MBTA does not distinguish between "intentional" and "unintentional" take. Migratory birds include songbirds, waterfowl, shorebirds, and raptors. In Alaska, all native birds except grouse and ptarmigan (which are protected by the State of Alaska) are protected under the MBTA.

j) In order to ensure compliance with the MBTA, it is recommended that the lessees survey the project area before construction, vegetation clearing, excavation, discharging fill, or other activities which create disturbance, and confirm there are no active migratory bird nests. It is recommended that lessees contact the USFWS for assistance and guidance on survey needs, and other compliance issues under the MBTA. While the Service can recommend methods (such as surveys and timing windows) to avoid unintentional take, responsibility for compliance with the MBTA rests with lessees. In the lease sale area, the USFWS normally recommends that to prevent impacts to nesting migratory birds, no vegetation clearing, fill placement, excavation, or other construction activities be conducted between May 1 and July 15.

k) Bald eagles are protected under the Bald Eagle Protection Act (16 U.S.C. 668-668c) and the MBTA. Lessees are responsible to ensure their actions do not take bald eagles. The Bald Eagle Protection Act defines “take” to include disturbing birds. A survey for bald eagle nests is necessary before beginning exploration or development activities during the nesting period (March 1 through August 31). Any nests located within one-half mile of the project site must be mapped, and destruction of nest trees or locations is prohibited. If any nests are located within one-half mile of a project site, lessees shall meet with the USFWS before construction to review any site-specific concerns regarding the subject nest. USFWS generally recommends no clearing of vegetation within 330 feet of any nest. No activity should occur within 660 feet of any nests between March 1 and June 1. Between June 1 and August 31, no activity should occur within 660 feet of active eagle nests until after juvenile birds have fledged, unless specifically authorized by the USFWS. While the USFWS can recommend ways to avoid the take of eagles, final accountability lies with the party responsible for the action.

#### **7. Matanuska-Susitna Borough**

a) The lessee is advised that all development in the Point MacKenzie Port Special Use District must comply with Matanuska-Susitna Borough Code Chapter 17.23: Point MacKenzie Port Special Use District.

b) The lessee is advised that any exploration work on borough-owned tidelands or uplands in the area will require a land use permit from the borough’s land management division.

### **Department of Environmental Conservation**

The Alaska Department of Environmental Conservation’s mission involves the permitting and authorization of actions relating to oil and gas development, oil spill prevention and response, pollutant discharges and other activities affecting Cook Inlet. The following comments are organized and presented in the following categories and order:

- Water quality management
- Air quality management
- Regulation of solid waste disposal
- Oil spill prevention and response
- Contaminated sites
- Additional information

A complete listing of permits issued and managed by the Alaska Department of Environmental Conservation is attached.

#### **Water Quality Management**

The Water Division regulates water quality for the State of Alaska through water quality and wastewater standards found in the Alaska Administrative Code at 18 AAC 70 and

18 AAC 72. These regulations provide specificity for the State of Alaska's implementation of the federal Clean Water Act. The state's water and wastewater regulations are based on the general prohibition principle, such that no person may cause or contribute to a violation of the water quality standards in state waters and discharges to state waters must be authorized by a permit. These water quality standards apply to both marine and fresh waters and protect water quality for a wide variety of uses, including growth and propagation of aquatic life, which includes marine mammals and their prey. For waters that are of naturally high quality, the water quality standards include an anti-degradation provision that prohibits any degradation of water quality unless certain conditions are met and even then all uses still have to be protected. Alaska's water quality standards also may apply to waters of the outer continental shelf adjacent to Alaska by virtue of project consistency reviews through the Alaska Coastal Management Program. The Division's Non-Point Source Water Pollution Control Program regulates stormwater pollution of water bodies through review and approval of construction plans and stormwater pollution prevention plans from industrial sites.

#### Industrial Wastewater Discharges

There are a number of municipal wastewater facilities that have the potential to ultimately discharge into Cook Inlet. There are also a number of smaller community systems and sewage outfalls that have the potential to ultimately discharge into Cook Inlet. The following wastewater treatment facilities (WWTF) are permitted under ADEC's wastewater regulations (18 AAC 72):

- Anchorage Point Woronzof Asplund WWTF
- Girdwood WWTF
- Settlers Bay Village Subdivision WWTF
- Eagle River WWTF
- Palmer WWTF
- Homer WWTF
- Kenai WWTF
- Soldotna WWTF

#### Cook Inlet oil and gas wastewater discharges

Oil and gas development has taken place in Cook Inlet since 1957 and at present there are over 200 oil wells in production and three production plants on the shores of Cook Inlet. The majority of industrial wastewater discharges permitted by EPA and ADEC are associated with oil and gas facilities located in or adjacent to Cook Inlet. There are also a number of seafood processors who have discharges permitted by EPA and ADEC. The following oil and gas facilities are on platforms located in or immediately adjacent to Cook Inlet:

- Chevron Nikiski Refinery
- Tesoro Alaska Kenai Refinery
- Unocal Swanson River
- Unocal Trading Bay Production Facility

- Unocal Anna Platform
- Unocal Baker Platform
- Unocal Bruce Platform
- Unocal Dillon Platform
- Unocal King Salmon Platform
- Unocal Dolly Varden Platform
- Marathon Oil Spark Platform
- Phillips Tyonek Platform A
- Marathon Oil Spur Platform
- Unocal Granite Point Platform
- Unocal Grayling Platform
- Unocal Monopod Platform
- Unocal Steelhead Platform
- Forest Oil Osprey Platform
- Cook Inlet Pipeline Co. Drift River Facility

#### Water Quality Monitoring and Assessment

There are a number of waters that flow into Cook Inlet that are considered impaired according to water quality regulations. The bulk of the impaired waters are listed due to non-point source pollution, including fecal coliform pollution associated with urban run-off or land development. The following waters fall in the impaired water category:

#### Anchorage

- Campbell Creek
- Campbell Lake
- Chester Creek
- Fish Creek
- Furrow Creek
- Lake Hood/Spenard Lake
- Jewel Lake
- Little Campbell Creek
- Little Rabbit Creek
- Little Survival Creek
- Ship Creek
- University Lake
- Westchester Lagoon
- Cheney Lake

#### Wasilla

- Cottonwood Creek

#### Palmer

- Matanuska River

#### Eagle River

- Eagle River

#### Kenai

- Kenai River

### **Air Quality Management**

The Air Quality Division regulates air quality for the State of Alaska through the air quality standards found in the Alaska Administrative Code at 18 AAC 50 and the vehicle emission standards at 18 AAC 52. The State of Alaska has primary authority for implementation of the federal Clean Air Act on state lands and federal lands.

### **Regulation of Solid Waste Disposal**

Under the general provisions of Subtitle D of the Resource Conservation and Recovery Act (RCRA), the Division of Environmental Health, Solid Waste Program has an approved program for regulation of solid waste disposal in Alaska. The state's solid waste management regulations, based on the federal standards in 40 C.F.R 257 and 40 C.F.R 258, are found in the Alaska Administrative Code at 18 AAC 60. These regulations make a general distinction between municipal and non-municipal disposal facilities and include requirements for the design, operation, closure, and monitoring of those facilities to minimize harm to human health and the environment.

The Solid Waste Program permits and regulates both municipal and non-municipal disposal facilities in the southcentral region of Alaska. Non-municipal facilities are associated with the Oil & Gas industry and the Mining industry, and municipal facilities are found in every community. At present, every disposal facility in Cook Inlet and adjacent areas is either permitted or authorized under a plan approval.

### **Oil and Gas Solid Waste Facilities**

The Solid Waste Program regulates oil and gas drilling waste management facilities in Cook Inlet and adjacent areas. Drilling waste is generated by oil and gas exploration and production activities. Drilling waste, which consists of drilling mud, cuttings, pigging waste, fluids, and other related wastes, is a solid waste that is excluded from regulation as a hazardous waste through 40 C.F.R 261.4(b)(5). However, drilling waste may include contaminants that pose a significant public health and environmental risk, and as such, drilling waste storage, treatment, and disposal facilities must be designed and operated to minimize the potential for contaminant release. The Solid Waste Program requires surface water monitoring at permanent Cook Inlet oil and gas solid waste facilities and inspects these facilities annually.

In Cook Inlet, drilling waste is primarily disposed of by underground injection although management can involve surface storage of solid waste prior to injection.

The Solid Waste Program authorizes drilling waste management through several mechanisms, including individual solid waste permits, solid waste general permits, solid waste treatment permits, and temporary storage plan approvals.

### Municipal Solid Waste Facilities

Municipal solid waste landfills are subdivided into three classifications based on the average tonnage of waste received each day. The specific requirements for design, operation, monitoring, and closure of the landfill vary with the classification: the larger the landfill, the more stringent the requirements. Class I and Class II landfills are inspected at least once per year; permitted Class III landfills are inspected at least once every five years. Information on permitted landfills is located at:

[http://www.dec.state.ak.us/eh/sw/SW\\_Permits/sites.htm](http://www.dec.state.ak.us/eh/sw/SW_Permits/sites.htm)

### **Oil Spill Prevention and Response**

The DEC Division of Spill Prevention and Response (SPAR) is responsible for protecting Alaska's land, waters and air from oil and hazardous substances spills. SPAR regulates spill prevention through review and approval of spill prevention plans for oil terminals, pipelines, tank vessels, barges, refineries, oil exploration facilities and oil production facilities. SPAR ensures response preparedness through the review and approval of oil discharge contingency plans, inspections, oil spill response exercises, oil spill response drills. Oil Spill contingency plans are required under Alaska Statute AS 46.04.030 and Alaska Administrative Code regulations at 18 AAC 75. Oil Spill Proof of Financial Responsibility is required under Alaska Statute AS 46.04.030. The State of Alaska requires oil spill contingency plans for the following facilities in Cook Inlet:

- Offshore oil and gas exploration and production facilities (14)
- Onshore oil and gas exploration and production facilities (9)
- Crude oil transmission pipelines (4)
- Crude Oil Terminals (over 10,000 bbls) (8)
- Noncrude oil terminals (over 10,000 bbls) (9)
- Tank vessels (15)
- Barges (6)
- Railroad (1)

The DEC Spill Prevention and Response (SPAR) Division's mission is to prevent, respond and ensure the cleanup of unauthorized discharges of oil and hazardous substances. The Industry Preparedness Program (IPP) requires regulated facilities and vessels to develop state-approved oil spill response and contingency plans, to establish a facility-wide spill prevention program and to ensure that personnel, equipment and financial resources are available to respond to spills. In the event of a spill, the Prevention and Emergency Response Program (PERP) serves as the State's emergency responders to oil and hazardous substance spills and ensures that cleanup measures are implemented as soon as possible. A search of the ADEC oil spill database revealed over 5,800 spills in the Cook Inlet Subarea from 1996 through 2005. There appears to be a regular seasonal increase in spill during the May through September timeframe. This could be the result of increased commercial, sport and subsistence fishing vessel activity during this timeframe

Detailed information on historical oil spills is available in the department's latest report, *DEC 10-Year Statewide Summary: Oil and Hazardous Substances Spill Data*, and the *Summary of Oil and Hazardous Substances Spills by Subarea*, both of which are available on the program's web site.

#### Risk Assessment of Oil and Gas Infrastructure

The majority of spills that have occurred in association with oil and gas development were from transportation facilities, including pipelines. The Alaska Department of Environmental Conservation is currently undertaking a comprehensive system-wide risk assessment of Alaska's oil and gas infrastructure in order to protect the steady flow of oil and gas while protecting the public's safety and the environment. The Environmental Protection Agency, the Bureau of Land Management and the Minerals Management Service will also play an advisory role.

This project is a high priority for Governor Palin's administration and is being conducted on an aggressive time schedule. The Department anticipates this project will be completed by 2010 and will recommend physical changes to infrastructure as well as changes to existing policies, procedures, standards, and regulations. This effort will provide an opportunity to prevent future oil spills which could have had an effect on Cook Inlet beluga whale habitat. The Geographic scope of the project includes the Cook Inlet oil and gas infrastructure, including production facilities, the Cook Inlet Gas Gathering System up to the Nikiski LNG Plant and the Cook Inlet Pipeline up to the Drift River Marine Terminal loading arms.

#### Contaminated Sites

The DEC Contaminated Sites program oversees or conducts cleanup of contaminated sites based on their danger to public health and the environment. The contaminated sites cleanup process is governed by Alaska Statutes at Title 46 and Alaska Administrative Code regulations at 18 AAC 75 and 18 AAC 78. Cleanup processes overseen by a federal agency, such as those at formerly used defense sites are also governed by federal regulations.

The ADEC Contaminated Sites database contains information on 537 sites within the Cook Inlet Region, This database include contaminated site and former contaminated sites and is available at: [http://www.dec.state.ak.us/spar/csp/db\\_search.htm](http://www.dec.state.ak.us/spar/csp/db_search.htm)

#### References

DEC Air Permits Permit Information, available at <http://www.dec.state.ak.us/air/ap/mainair.htm>

DEC Contaminated Sites Database, available at [http://www.dec.state.ak.us/spar/csp/db\\_search.htm](http://www.dec.state.ak.us/spar/csp/db_search.htm)

DEC Solid Waste Sites, Northern Region, available at  
<http://www.dec.state.ak.us/eh/sw/northern.htm>

DEC Wastewater Permits Database, available at  
<http://www.dec.state.ak.us/ias/permitsearch/default.aspx>

DEC (2007) *DEC 10-Year Statewide Summary: Oil and Hazardous Substances Spill Data* (July 1, 1995 – June 30, 2007) available at  
<http://www.dec.state.ak.us/spar/perp/subreports.htm>

DEC (2007) *Summary of Oil and Hazardous Substance Spills by Subarea (July 1, 1995 – June 30, 2005)*  
[http://www.dec.state.ak.us/spar/perp/docs/10year\\_rpt/10Yr\\_Subareas\\_FINAL.pdf](http://www.dec.state.ak.us/spar/perp/docs/10year_rpt/10Yr_Subareas_FINAL.pdf)

DEC (2008) Alaska Risk Assessment (ARA) of Oil & Gas Infrastructure at  
<http://www.dec.state.ak.us/spar/ipp/ara>

## **ATTACHMENT 2: Economic or Other Relevant Impacts of Designation of Critical Habitat for Beluga whales in Cook Inlet**

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### **Commercial activities or attributes within Cook Inlet watershed:**

#### **OIL AND GAS**

Modern exploration in Cook Inlet began in 1955 when Richfield Oil Corporation began exploration on the Kenai Peninsula in the Swanson River area. Oil was discovered on July 23, 1957. This discovery began an oil rush in south central Alaska. Shortly after the Swanson River discovery, Standard Oil Company of California and Richfield formed a joint venture to explore for oil. Additional wells were drilled in the Swanson River area, and more onshore leases were taken on both sides of Cook Inlet. Several other oil companies moved in to participate in leasing and drilling activities on the Kenai Peninsula. By 1959, 187,000 barrels of crude oil were produced annually. The State's first competitive sale was held December 10, 1959, bringing the State more than \$4 million in bonus bids. By 1960, further development of the Swanson River and Soldotna Creek Units raised annual oil production to 600,000 barrels. Five other Cook Inlet fields began production between 1965 and 1972. In 1962, Pan American Petroleum Corporation discovered the first offshore oil in Cook Inlet. This led to extensive exploration throughout the Cook Inlet region in the 1960s and 1970s. Chevron opened a refinery in 1963. The Tesoro refinery began operating in 1969. Cook Inlet production peaked at 83 million barrels per year in 1970 and declined to 7 million barrels per year in 2005.

More recently, the West McArthur River field began production in 1993 and Redoubt oil field in 2002. All Cook Inlet oil is currently shipped to the Tesoro refinery at Nikiski on the Kenai Peninsula. Oil from fields on the west side of Cook Inlet is transported by pipeline to the Drift River terminal then transported to Nikiski. Oil from the eastside fields is shipped by pipeline directly to the refinery. By year-end 2005, the Cook Inlet tallied more than 1.3 billion barrels of cumulative oil production, including about 11 million barrels of natural gas liquids.

Cook Inlet gas production began as a by-product of Swanson River oil development. As more oil and gas fields were discovered, nearby markets for the gas were developed in Anchorage and Kenai to supply space heat and electricity generation. In 1968 Unocal launched the ammonia-urea plant at Nikiski to take advantage of the abundance of cheap stranded natural gas. This plant was acquired in 2000 by Agrium Inc. of Calgary, Alberta. In 1969, Phillips and Marathon began operating the liquid natural gas (LNG) plant, also located at Nikiski.

LNG exports to Japan accounted for about a third of total Cook Inlet gas production. Total industrial use of Cook Inlet gas, including LNG exports, fertilizer manufacture, and oil field operations, has remained fairly constant at about 75 percent of total consumption since 1990. Cook Inlet natural gas production has remained relatively stable at an

average of 203 Bcf per year from 2001 to 2005. In recent years, the steady increase in residential and commercial demand for space heating and electric power generation has resulted in demand exceeding current supply capacity.

The history of Swanson River gas production differs from other Cook Inlet fields. Initially, gas was imported from other fields and injected into Swanson River to enhance oil recovery. In 1992, the operator began to “blow-down” the reservoir. In recent years, the Swanson River field became a major net gas producer in Cook Inlet and, since 2005, has been transformed into a federally approved gas storage facility with approximately 2 Bcf of annual storage capacity. The State approved two gas storage facilities in Cook Inlet in depleted reservoirs at Pretty Creek and Kenai Field, which contribute 0.7 and 6 Bcf, respectively, annual storage capacity to the Cook Inlet gas pipeline system.

The Cook Inlet sale area encompasses approximately 4 million acres divided into 815 tracts ranging in gross area from 640 to 5,760 acres. The sale area consists of state-owned uplands and tide and submerged lands lying between the cities of Houston to the north, Homer to the south, the Chugach and Kenai mountain ranges to the east, the Aleutian Range to the west, and within Cook Inlet. In this year’s sale (May 24, 2007), 45 tracts were sold (213,120 acres) bringing in \$2.3 million in bonus bids.

Cook Inlet oil production peaked at 230,000 barrels per day in 1970 and declined to 19,500 barrels per day in 2005. Oil production in Cook Inlet is expected to continue beyond 2025, including oil production from the Beaver Creek field and other non-state lands. Oil and gas exploration drilling since 2000 in Cook Inlet is driven by strong demand and rising prices for both oil and gas, coupled with decline in production from existing fields.

In summary, the majority of developments along the Inlet occurred in the 1960s and 1970s. While the population in the communities has grown, the additional oil and gas facilities and related developments throughout the Inlet have occurred at a slow pace and have been tightly regulated by the responsible state and federal agencies. In 2001, gas reserves in south central Alaska were estimated to be at about a nine year supply. Over the past 6 years, there have been about 30 exploratory wells drilled in Cook Inlet compared with approximately 226 exploratory wells from 1955 through 1999. (See Table below) That approximate rate of exploration can be expected to increase over the next two decades, as the limitations on gas supply in Southcentral Alaska become more severe. There are, however, no indications of a rapid and imminent increase in exploration. The economic value of that activity, in drilling alone, is roughly \$200 - \$300 million. Support services such as roads and facilities and other indirect and induced economic benefits to the area (primarily to the Kenai Peninsula) add much more.

Table: Oil and gas exploration wells and gas fields discoveries in Cook Inlet, 1955-2003.

Time Period	Number of exploratory wells drilled	Number of gas fields discovered	Success ratio (%)	Estimated ultimate recovery (Bcf)
1955-60	17	5	29.4	2,603.50
1961-65	42	9	21.4	3,575.23
1966-70	85	6	7.1	1,814.86
1971-75	29	1	3.4	10.86
1976-80	14	1	7.1	8.19
1981-85	13	0	0	0
1986-90	5	0	0	0
1991-95	11	2	18.2	139.78
1996-00	10	3	30.0	151.72
2001-03	14	1	7.1	100.00 (?)
Total	240	28	11.7	8,404.14

*Source: "South-Central Alaska Natural Gas Study", June 2004, Prepared for the US Dept. of Energy, National Energy Technology Laboratory, Arctic Energy Office, Contract: DE-AM26-99FT40575*

Chevron currently has a \$200 million program to find new oil and gas in Cook Inlet. ConocoPhillips and Pioneer Natural resources are also active in Cook Inlet and optimistic about the prospects. Escopeta Oil contracted for a drilling rig to be approved for use in Cook Inlet for both oil and gas exploration. The economic value with the renewed interest in Cook Inlet oil and gas will be substantial, especially to the Kenai Peninsula Borough.

It is uncertain how a beluga recovery plan may impact the economics for exploration and development of oil and gas in Cook Inlet. However, it has only been the recent spike in natural gas price that made the Inlet once again attractive for exploration. Additional costs associated with beluga recovery plan requirements and Section 7 consultation could curtail enthusiasm due to significant regulatory delays and increased costs.

## **COAL**

The Cook Inlet – Susitna Coal Province hosts significant coal resources and include the Beluga, Kenai, Matanuska, Susitna, and Yentna coal fields. There are numerous coal leases on the Beluga and Matanuska coal fields, but no active mining is occurring at this time. The Alaska Department of Natural Resources has issued several coal exploration and mine permits within these coal fields and is in the process of coordinating the permitting of one proposed coal mine.

### **Beluga Field**

The Beluga field is one of Alaska’s most accessible sources of steam coal. Potentially mineable coal occurs in the Capps (B1), Chuitna (B2), and Threemile (B3) districts within 6 to 25 miles of port sites on Cook Inlet. Several coal seams have been identified in the area east of the Chuitna River (Diamond Coal Co., 1986); and in the area west of the Chuitna River (Placer Dome, 1986).

The Chuitna Coal Project is a surface coal mining and export development located in the Beluga coal field of Southcentral Alaska, approximately 45 miles west of Anchorage, near Tyonek. The project is based on the development of a 300 million ton, ultra low sulfur, sub bituminous coal resource, the center of the mine pit will be approximately 12 miles from the coast of Cook Inlet. The project area is largely undeveloped except for a system of primitive roadways that remain as a result of previous oil and gas exploration and production and logging activities. The workforce to support operations is anticipated at 350 people from Anchorage and the Kenai Peninsula.

The proposed Project includes: a surface coal mine and associated support facilities (Chuitna Coal Mine); mine access road; coal transport conveyor; personnel housing; air strip facility (Chuitna Project Infrastructure); a logistic center; and coal export terminal (Ladd Landing Development). The coal export terminal is currently proposed to include a 10,000-foot trestle constructed into Cook Inlet for the purpose of loading ocean-going coal transport ships. The mine will be positioned in close proximity to the Chuitna River and Lone Creek. The Chuitna River is anticipated to be proposed for use for discharge of some of the mine's wastewater and will be regulated closely by several State entities to assure its quality is protected, particularly for anadromous fish habitat. PacRim Coal, the project applicant predicts a minimum 25-year mine life based on the proven reserves in one of three mining areas within the 20,571 acre coal lease area.

If the proposed loading area is listed as critical habitat, this would likely delay and in other ways impact construction plans of the trestle due to the required Section 7 consultation. Such delays or additional stipulations, beyond the tightly regulated mechanisms already in place under state and federal authorities, will affect the project's construction and operational economics. At the present time, studies are being conducted in anticipation of steps to reduce hydrologic impacts and noise impacts from the trestle during construction and operation in order avoid impacts to beluga and other biological and physical features of the habitat. The total economic benefit to south central Alaska from this proposed project throughout its expected life is projected to be in the hundreds of millions of dollars.

### **Kenai Field**

The Kenai Field contains three districts – the Kenai onshore, Kenai offshore, and Seldovia – Port Graham districts (K1, K2, & K3). Coals of the Beluga and Tyonek Formations underlie extensive areas of Cook Inlet, and it is estimated that 532 million short tons of coal occur in beds more than 20 feet thick to a depth of 10,000 feet.

### **Matanuska Field**

This field is located in the Matanuska Valley of South Central Alaska near the head of Knik Arm, 50 miles NE of Anchorage. This field contains the Wishbone Hill district, the Chickaloon district, and the Anthracite Ridge District (M1, M2, & M3). The Wishbone hill district ranks second in historic coal production; 7 million short tons of bituminous coal were extracted for railroad, power plant, and domestic use prior to 1968 (Barnes & Payne, 1956). Rocky Mountain Energy (1986) identified 17 million tons of surface mineable coal in the Western and Northeastern parts of the Wishbone hill district. The higher ranked coals of the Chickaloon and Anthracite Ridge districts have not been fully explored due to their structural complexity (Waring, 1936).

The Wishbone Hill Mine lies at the western end of the Wishbone Hill Coal district on the southwestern extent of Wishbone Hill approximately seven miles north of Palmer, Alaska. The project is based on the development of a 13 million ton, ultra low sulfur, bituminous coal resource. The project targets four main coal seam groups area proposed for mining utilizing a truck and shovel operation. The workforce to support operations is anticipated at 100 people from Anchorage and the Matanuska-Susitna Borough.

The Jonesville Coal Mine is located in the Matanuska Valley approximately two miles northwest of Sutton, Alaska, near the southeast portion of Wishbone Hill. Mining has been conducted in this area since about 1916, and portions of as many as six separate coal seams have been removed in the past by both underground and surface methods. The project consists primarily of a surface spoils re-mining operation targeting the refuse of the former Evan Jones coal washing facility. Most of the surface disturbance will be associated with the surface re-mining operation. Annual production of re-mined material is expected to range between 350,000 and 750,000 tons.

### **Susitna Field**

The Susitna field contains two districts: the Susitna Flats district and the Little Susitna district. Extensive areas of coal that probably correlate with the Beluga or Sterling Formations of the Kenai Group underlie the Susitna Flats district. In the area north of the Castle Mountain fault, oil-well logs show seams up to 15 feet thick in 2,000 feet of Kenai Group rocks that overlie granitic basement. Just south of the Castle Mountain fault, a well log shows a total of 301 feet of coal in 37 seams in an 8,500 foot section of the Tyonek Formation. The test well did not reach basement (Conwell, Triplehorn, and Ferrell, 1982). The Susitna district has a potential resource of 14.7 million tones of coal that is borderline between high-volatile bituminous and subbituminous A (Barnes and Sokol, 1959).

### **Yentna Field**

Coal seams exposed in the area north of the Beluga Field generally occur in the Conglomerate and Sandstone members of the Tyonek Formation (Reed & Nelson, 1980). Less well-known than the Beluga Field, the Yentna contains drill-proven reserves in the outlying Canyon Creek and Johnson Creek districts (Y1 & Y2). The identified resources, to a depth of 250 feet and with less than a 10: 1 waste/coal ratio, are greater than 500 million short tons in the combined districts.

## **PORT OF ANCHORAGE**

The Port of Anchorage (POA) is a Commercial Strategic Seaport serving the majority of the residents, communities, and activities within the State of Alaska. Ninety percent of all consumer goods provided to eighty percent of the State's population (along the rail belt, Aleutians, Interior Alaska, Western Alaska, and the Arctic) transit through the port. The POA also handles consumer goods for all military installations in the State and supports the rapid military deployment of the US Army's Stryker Brigade Combat Team, Aviation Task Force, and Airborne Brigade Combat Team. When the POA officially

began operations in September 1961, 38,000 tons of cargo moved across its single berth in one year. In the years since, the POA has expanded to five berths and handles five million tons of cargo, generating more than \$750 million for the State’s economy.

The POA delivers jet fuel directly from the Port through pipelines to two military bases. In addition, the POA currently stages 100% of the exports of refined petroleum products from the State’s largest refinery and facilitates petroleum deliveries from several smaller refineries in the State. The POA also handles delivery of approximately eighty percent of all fuel for the Ted Stevens Anchorage International Airport, the busiest cargo airfield in the United States (measured by landed weight).

The POA currently is undergoing a comprehensive expansion program to replace aging infrastructure and enhance its ability to serve the State of Alaska as a major marine cargo and cruise complex. This expansion includes creating and developing land; constructing advanced road and rail infrastructures; constructing longer and deeper dock spaces with the ability to accommodate today’s larger ships; renovating and relocating existing dock structures and facilities; expanding gas and oil pipelines; and upgrading utility and communication infrastructure. Pre-expansion, the POA occupied 129 acres of land—approximately 120 acres of which serve as Port administration and tenant lease area—with the remaining approximately nine acres dedicated to road and circulation areas. Post-construction, the POA will have added 135 new acres of land, significantly increasing traffic movement throughout major industrial areas and in particular along the main arterial route supporting a combination of commercial, employee, and visitor traffic. The POA is fully operational without closure 365 days a year regardless of Alaska’s harsh weather conditions.

The Port of Anchorage is the economic life line that serves the majority of Alaska. Any disruption of the Port’s activities due to designation of critical habitat would economically impact most, if not all, of the State of Alaska.

**TOURISM**

Current summer visitor volume estimates for the Kenai Peninsula total 439,000.<sup>1</sup> On average, visitors spend \$934 per person while in Alaska, not including the cost of transportation to enter and exit the State. For the Kenai Peninsula region where visitors tend to spend an average of 5.3 nights, this amounts to a total of \$419 million and includes money spent by air, cruise, and highway travelers. The following table illustrates estimated Kenai Peninsula average spending by visitors by transportation mode:

**Total Estimated Visitor Expenditures in Kenai Peninsula Area (Millions of Dollars) Summer 2006 by Mode**

	All Visitors	Air	Cruise	Highway /Ferry
<b>Total in-state spending</b>	\$419	\$247	\$134	\$38

Source: AVSP Summer 2006

<sup>1</sup> Alaska Visitor Statistic Program Summer of 2006 conducted by McDowell Group for the Department of Commerce, Community and Economic Development.

Tourism impacts will be immediately felt. Any water-based activity from cruise ships to boat tours and commercial sport fishing might be limited or curtailed depending on areas designated as critical habitat and how a beluga recovery plan is written. For example, in 2005 the Kenai Peninsula's taxable primary tourism sales totaled \$84.2 million accounting for 10 percent of total taxable sales. (source: <http://www.borough.kenai.ak.us>).

Visitor Taxable Sales by Community in the Kenai Peninsula Borough, 2000 - 2005							
Year	Homer	Kenai	Seldovia	Seward	Soldotna	Other	Kenai Pen Borough Total
2000	\$ 12,487,597	\$ 4,827,106	\$ 440,636	\$ 19,561,615	\$ 3,204,886	\$ 27,178,838	\$ 67,700,678
2001	\$ 13,134,430	\$ 5,090,686	\$ 323,902	\$ 19,560,607	\$ 3,438,109	\$ 26,947,338	\$ 68,495,072
2002	\$ 14,371,079	\$ 4,699,916	\$ 315,411	\$ 20,304,667	\$ 4,323,213	\$ 26,900,296	\$ 70,914,582
2003	\$ 14,580,419	\$ 4,520,163	\$ 309,491	\$ 20,358,596	\$ 4,030,155	\$ 27,290,295	\$ 71,089,119
2004	\$ 15,963,723	\$ 4,693,265	\$ 302,136	\$ 21,557,817	\$ 4,506,852	\$ 30,665,855	\$ 77,689,648
2005	\$ 17,155,060	\$ 5,067,795	\$ 302,759	\$ 23,867,140	\$ 4,742,653	\$ 33,136,577	\$ 84,271,984

Source: [http://www.borough.kenai.ak.us/Econ/1S\\_P%20data/VisitorIndustry/Sales.htm](http://www.borough.kenai.ak.us/Econ/1S_P%20data/VisitorIndustry/Sales.htm)

Additionally, visitor industry business licenses totaling 8,055 in 2005 and representing 25 percent of total borough-wide businesses, account for 2,060 jobs or twelve percent of borough employment.<sup>2</sup> An important tourism-based employment segment is the Kenai River registered guides. The number of registered guides increased rapidly during 1985 – 1997, from 171 to 400. The number of guides in 2005 was 407. These guides operate on waters within the Cook Inlet watershed that could be impacted by additional restrictions on their activities if prey they utilize are designated as an essential element of critical habitat.

Additional information for communities throughout southcentral and the Cook Inlet watershed can be acquired from the following statewide tourism links:

*Alaska Office of Tourism Development:*

<http://www.commerce.state.ak.us/oed/toubus/home.cfm>

*Alaska Travel Industry Association:* <http://www.alaskatia.org/>

## SHORE FISHERIES AND AQUATIC FARMING

Shore fisheries authorized by the Alaska Department of Natural Resources (DNR) currently include approximately 345 leases, or lease applications, in Cook Inlet (including Kachemak Bay). During a fishery opening period, as determined by the Alaska Department of Fish and Game, set gillnets are suspended in the tide, harvested, and as the water ebbs the nets are removed from the tidelands to be cleaned and repaired. Some of the leases are for off-shore sites and must be tended by boat. Set net fishing activity occurs during the summer months of June through August. After fishing is completed, no gear or buoys remain on the tidelands. DNR collects approximately \$103,500 per year in fees from these leases. We do not have specific information on the true economic impact of the fishery because the leases are only issued to one individual per site. Often the extended family or multiple families participate in fishing one lease site, so the economic benefit is spread substantially. This estimated ex-vessel value and

<sup>2</sup> [http://www.borough.kenai.ak.us/Econ/1S\\_P%20data/VisitorIndustry/Earnings.htm](http://www.borough.kenai.ak.us/Econ/1S_P%20data/VisitorIndustry/Earnings.htm)

other economic benefits of the commercial Cook Inlet set net fishery are discussed in greater depth in the commercial fishing section of this chapter.

Aquatic farming currently authorized by the Alaska Department of Natural Resources includes approximately 18 leases in Cook Inlet; all are in Kachemak Bay. DNR collects approximately \$13,600 from the leases in Cook Inlet. One report estimates the total economic value of those leases at approximately \$414,000. The distribution of these leases within the larger Kachemak Bay is: 3 in Kachemak Bay itself, 4 in Jakalof Bay, 2 in Kasitsna Bay, 3 in Peterson Bay, and 6 in Halibut Cove. They range in size from .23 to 28.6 acres, with the median being 1.95 acres. The sites are primarily for suspended oyster growth on gear comprised of vertical leads attached to buoys and mesh baskets in which the oysters grow. These are suspended in the water column and should not lay on the bottom of the ocean floor.

## **TRANSMISSION LINES AND PIPELINES**

Approximately 22 transmission lines and oil and gas pipelines are permitted by DNR on tide and submerged lands in Cook Inlet. Most all of these rights of way were issued just after statehood in the 1960s and 1970s. These lines are either buried or laid on the submerged lands and since covered by mud. DNR expects to receive more applications for relocation or maintenance of existing facilities, construction of new facilities for new oil and gas discoveries, alternative energy projects (such as Fire Island wind generators), and tidal power generators in Cook Inlet. No new oil or gas discoveries have been announced, but there is renewed exploration activity in Cook Inlet. At present there is only one test tidal power project near Point MacKenzie on Matanuska-Susitna Borough tidelands. If that project is successful, there is a chance to see more tidal generators placed in Cook Inlet. The placement of the array of generators depends on many factors including tidal energy, substrate conditions, ice flows, navigation obstructions, and fishery considerations. The only impact from the proposed Fire Island wind farm would be the submerged power cable to the mainland.

## **OTHER FACILITIES**

### **The Agrium Facility**

Agrium has a long history in Alaska, with its roots in Cominco Fertilizers Ltd which dates back to 1931. The Kenai plant is located on the east side of Cook Inlet on the Kenai Peninsula and boasts a tidewater terminal. Agrium produced anhydrous ammonia and urea. Annual urea capacity is 640,000 tons and net ammonia capacity is approximately 280,000 tons. Kenai Storage Facility can store 73,000 tons of ammonia and 118,000 tons of dry product. Shipping is primarily by water; however, some product is shipped by truck to local agricultural and industrial markets. In December 2007 the Agrium facility closed due to a shortage in the supply of Cook Inlet natural gas.

### **Port MacKenzie**

Port MacKenzie is strategically placed as an area for commercial and industrial expansion adjacent to Anchorage. The Port is the only south central port site not

constrained by urbanization. The 14 square miles of uplands are dedicated solely for commercial/industrial development. A ferry, bridge, and railroad spur are all programmed for Port MacKenzie. The ferry is scheduled to start operating between Anchorage and Port MacKenzie in summer 2007. Current business includes 'NPI, LLC,' an exporter of wood chips that invested \$3 million in the Deep-Draft Dock and \$20 million in a new road, commodities storage pad, conveyor system, and equipment. The Deep-Draft Dock's total project costs were approximately \$15.4 million; aside from the creation of new jobs in the Matanuska-Susitna Borough, the project is estimated to produce \$220,000 to 600,000 in annual wharfage and dockage fees.

The ferry terminal building at Port Mackenzie was completed in October 2006, ahead of schedule. The terminal is a 7,000 square feet, two-story facility. Funding for the construction of the terminal was acquired from a Federal Transit Administration grant, and the total cost of the project was approximately \$4.5 million.

Port MacKenzie consists of a 500' bulkhead barge dock at -20' mean lower low water (MLLW), a 1,200' long deep-draft dock at -60' MLLW, and 8,940 acres (14 square miles) of adjacent uplands which are available for commercial lease. There is also a filter rock ramp adjacent to the south wingwall which is useable two hours before high tide until two hours after high tide for vessels with ramps. This allows for heavy equipment to be driven on/off the dock. The dock has a gravel surface with a load capacity of 1,000 lbs. /sq ft. The deep-draft dock is equipped with a 5' wide conveyor system capable of loading bulk commodities at 2,000 tons/hour.

### **Cook Inlet Ferry System**

This is currently in the planning/build out stage. The ferry is now under construction. Two docks are being planned for upper Cook Inlet. Permits are in place for the Knik side, the Municipality of Anchorage has yet to issue permits for the Anchorage landing. Total investment for the project is \$44.8 million. The two planned docks could be affected if Cook Inlet beluga whales are listed under ESA.

### **Knik Arm Bridge Crossing**

The Knik Arm Bridge and Toll Authority (KABTA), was established by the Alaska Legislature in 2003 to construct a bridge across the Knik Arm of Cook Inlet to link Anchorage to the Matanuska-Susitna Borough. To date, efforts to build the bridge have cost \$33 million, and another \$10 million is budgeted for 2007. KABATA hopes to have the bridge operational by 2010. The Federal Highway Administration has not released an environmental impact statement for the project, which KABATA completed on February 6. The fate of the proposed bridge could be affected if Cook Inlet beluga whales are listed under ESA.

## **MUNICIPAL WASTEWATER DISCHARGES**

Since the early 1980s, Anchorage Water and Wastewater Utility (AWWU) of the Municipality of Anchorage has operated under a waiver of Section 301(h) of the Clean Water Act, allowing AWWU to discharge wastewater without secondary treatment. This

waiver was given in recognition of the high mixing capacity of the tidal flats in the discharge zone, the limited number (<20) of permitted industrial discharges in AWWU's service area, and regular toxicity tests demonstrating a lack of harm to marine wildlife.

Kenai and Homer have both primary and secondary treatment facilities in place, so it is fair to state that those communities would **not** face the same level of prospective financial burden as Anchorage if an upgrade were required. Currently, AWWU of the Municipality of Anchorage is in good standing with the EPA. In spite of the track record, an ESA listing of beluga whale would increase operational costs to rate payers due to the imposition of stricter wastewater discharge standards. A potential worst case scenario would result if the facilities permit were not reauthorized. Facility upgrades to comply with new standards could cost AWWU utility rate payers \$400 - \$600 million.

The following additional information is excerpted from correspondence by Craig Woolard, Ph.D., P.E., Treatment Division Director, Anchorage Water and Wastewater Utility:

*. . .the Asplund facility which has operated since October, 1985 under a Clean Water Act 301(h) waiver which permits discharge of primary treated effluent to Cook Inlet.*

*In order to operate under a 301(h) waiver, AWWU conducts extensive monitoring of our treatment facility and Cook Inlet to verify that our activities are not impacting the environment. These monitoring requirements are over and above those normally placed on conventional secondary treatment plants to insure the receiving body of water is not degraded. Our monitoring activities are too numerous to mention in total here but include:*

- *Influent, effluent and sludge monitoring for conventional compounds (biochemical oxygen demand, total suspended solids, fecal coliform bacteria) and toxic pollutants and pesticides (126 priority pollutants that include metals and cyanide) and organics.*
- *Receiving water quality monitoring to determine effluent plume dispersion and compliance with water quality standards.*
- *Biological and sediment monitoring to measure toxicity of the effluent to standard test species, sediment quality, the concentration of bacteria in the Inlet, and the bioaccumulation of effluent constituents in local species (e.g., algae, salmon and cod).*

*AWWU also administers an Industrial Pretreatment Program to enforce the MOA sewer ordinance and prevent local industries from discharging wastes that could impact treatment performance or Cook Inlet water quality. AWWU also supports a non-industrial source control program that partially funds the MOA hazardous waste collection facilities to prevent the introduction of harmful wastes into the sewer system.*

*The monitoring data show that over the last 20 years, the performance of the Asplund facility has been excellent. This facility has been operated to meet effluent limits and requirements specified in the NPDES permit and 301(h) Waiver. In fact, the Asplund treatment process achieves removal rates that are much higher than typical primary treatment facilities. The discharge itself contains very low concentrations of metals or organic materials and meets discharge requirements and water quality standards. In addition, Knik Arm provides rapid mixing and dispersion of wastewater discharged by the Asplund facility into the marine waters off Point Woronzof. As a result, our monitoring in Knik Arm has found no evidence of any significant impact of the discharge on the water quality of Cook Inlet or Cook Inlet beluga whales.*

*NMFS concurred with this assessment as part of our 2000 permit renewal. As part of the permitting process, EPA prepared a biological evaluation of site-specific water quality criteria for the Point Woronzof Area and concluded that that conventional pollutant and metals discharges allowed by the NPDES permit were not likely to adversely affect beluga whales. NMFS concurred with this determination in 2000.*

*In addition, EPA also conducted an Essential Fish Habitat Assessment as part of the permit renewal process and concluded that issuance of our discharge permit was not likely to adversely impact any essential fish habitat in the vicinity of the discharge. Again, NMFS concurred with these findings in 2000.*

## **MINING**

The Cook Inlet watershed includes all or portions of 11 mining districts with past production greater than 2 million troy ounces of gold; more than 143 million tons of sand and gravel and more than 9.5 million tons of rock in the past 25 years; 40,000 tons of metallurgical-grade chromium ore; and significant silver, copper, antimony, and coal. Total past production value of these commodities at current commodity prices exceeds \$2.5 billion.

The area of the Cook Inlet watershed is richly endowed with mineral resources. There are over 1,500 known mineral occurrences in the Cook Inlet watershed tabulated in the Alaska Resource Data Files (ARDF) (<http://ardf.wr.usgs.gov/>). These mineral occurrences are about evenly split between placer gold and metallic lode sites. Significant gold, silver, copper, zinc, lead, nickel, platinum, chromium, tin, and antimony occurrences are known in the area, and these commodities are being aggressively explored by international mining companies in this region. In the past 5 years, mining companies have spent more than \$27.5 million exploring for minerals in the south central region of Alaska. More than 10,186 mining claims and mining leases cover State and federal lands within the Cook Inlet watershed. Significant recent mineral discoveries, such as the Whistler copper-molybdenum-gold-silver prospect near Rainy Pass, the Lucky Shot gold prospect in the Willow Creek mining district, and the Golden Zone gold-silver-copper property near the Chulitna River, may be developed in the near future.

The area's excellent infrastructure and proximity to a large workforce have and will continue to attract mineral exploration for the foreseeable future.

Currently, there are no large mines operating around Cook Inlet. However, there are a large number of mineral occurrences around the Inlet, particularly along the eastern flank of the Alaska Range. The Pebble prospect is the obvious prospect for a large mine in the foreseeable future. A number of companies are exploring in the area north and west of Iliamna near the Pebble prospect. On the other side of Cook Inlet, there is a chromite deposit at Red Mountain, on the southern end of the Kenai Peninsula. There is presently no activity on the deposit, but it has been mined in the past and could be developed in the future. The deposit is on Cook Inlet Region Inc. (CIRI) land. Full Metal Minerals is doing development drilling on the old Lucky Shot gold mine on upper Willow Creek in the Talkeetna Mountains, with a good possibility of developing that prospect into a working mine again. The Lucky Shot will likely be a small operation, and farther away from Cook Inlet. This deposit is small but has good values and could become a mine in the future. The Johnson River prospect is on CIRI land.

Currently no shoreline or offshore mining activities occur around Cook Inlet. Hemis Gold is beginning an offshore sampling program in the Anchor Point area this year.

### **The Pebble Project**

The Alaska Department of Commerce, Community and Regional Development recently did an evaluation of the economics of a base case mining operation at the Pebble prospect. The base case considered that the mine would be developed as a combination underground and open pit operation with milling at site. Mineral concentrates would be shipped by pipeline to Cook Inlet to a port located near Williamsport.

It is anticipated that typical operation of Pebble, although not yet proposed by the operator, would involve mining 80,300,000 tons of ore annually. Development costs would be in the order of \$4 billion for this typical scenario and employ several thousand persons, many from the immediate area. Direct operating employment would be in the order of 3,500 persons on a full time basis. Other elements of the base (typical) case would be:

- Power would be provided from the Kenai Peninsula
- Concentrates would be shipped worldwide for smelting and metals recovery
- Tailings from the milling operation at site would be placed in a tailings pond (lake) to prevent oxidizing and mobilizing sulfides and metals
- Cost of labor was assumed to be 40% of the total operating cost for the operations; wages would average \$85,000 annually plus 35% burden and benefits
- The base case operating cost was calculated to be \$12.50 per ton milled.

Operation of the property would have a significantly positive economic impact to southwest Alaska and the State. The results of preliminary tax calculations indicated that the mine would pay average annual revenues as follows:

- Municipal taxes of \$23.3 M
- Total state revenues of \$141.1 M (mining license and income taxes, production royalty and claim lease payments).

The project would contribute to indirect employment of a certain percentage, probably equal to or exceeding the direct employment at the operation. This would add at least another 3,500 jobs to the immediate area and the State. Fairbanks Gold's Ft. Knox property is estimated to contribute \$180 million per year to the economy of Fairbanks and vicinity; the Pebble project would be several orders of magnitude larger than Ft. Knox suggesting a tremendous economic influence. This economic boost could easily be in the order of \$500 million annually.

## TIMBER

Approximately 39,203 acres of state, private, and borough land could be harvested for timber over the next 20 years within the Cook Inlet watershed. A summary of these harvests is shown below.

PROJECTED TIMBER HARVEST ACTIVITY IN COOK INLET WATERSHED					39,203 acres				
Division of Forestry estimates of likely timber harvest activity in the Cook Inlet watershed, 2007-2027. Actual harvests will depend on market demand and forest management decisions by the landowners.									
Total within 5 years (2007-2011)					Total within 5-20 years (2012-2027)				
		State	Other	Total	Notes	State	Other	Total	Notes
High Probability	Mat-Su	1,000	1,500	2,500	Small sales to local mills on state, Native, and Borough land; plus land use conversions on other private land; limited harvesting for chips	3,000	1,000	4,000	Small sales to local mills
	Kenai Peninsula	2,500		2,500	Ongoing sales of spruce beetle-killed timber	1,500		1,500	
	W. Side Cook Inlet	0	0	0					
Moderate Probability	Mat-Su	2,800	500	3,300	Additional harvesting for chips or pellets -- 2800 acres State sales, 1000 ac Borough sales, approx. 1500 ac in Native sales+ private land use conversions	7,000-12,000	200-400	700-1200	Additional harvesting for chips or pellets
	Kenai Peninsula	7,000	2,000-5,000	9,000-14,000	Additional harvesting for pellets				
Low Probability	Tyonek		5,000	5,000	Harvesting for chips on Native and Mental Health land in Tyonek area				Harvests could occur on Tyonek land if harvest is not complete in first 5 years
	Tuxedni Bay		2,400	2,400	Native land at Crescent River				see notes
	Kalgin Island	1,100		1,100					
	S. Kenai Pen.						500-1,000		Native land Seldovia to Port Chatham
	Jakolof Bay						500		Mental Health Land/Native land
	W. Side Cook Inlet						2,000		Native land

## FISHERIES

The statutory responsibility of the Alaska Department of Fish and Game is to protect, maintain, and improve the fish, shellfish, and aquatic plant resources of the State, consistent with the sustained yield principle for the maximum benefit of the economy and the people of Alaska. The following comments address examples of the economic impact of designating critical habitat aspect of a proposed listing under ESA.

The Alaska Department of Fish and Game manages all fish stocks for sustained yield under the mandate of the Alaska Constitution and manages salmon according to the regulatory policy for the management of sustainable salmon fisheries, 5 AAC 39.222, which is based in part on the goal of ensuring “*conservation of the salmon and the salmon’s required marine and aquatic habitats.*”

### **Subsistence Fisheries**

Most of the waters of the Cook Inlet Management Area are within the Anchorage-MatSu-Kenai Nonsubsistence Area as established by the Joint Boards of Fisheries and Game (5 AAC 99.015(3)). Subsistence fisheries are not authorized within these nonsubsistence areas. Non-commercial harvesting opportunities are provided under sport and personal use fishing regulations.

Cook Inlet waters outside the nonsubsistence area include the Tyonek Subdistrict and the western portion of the Susitna River drainage in Upper Cook Inlet, plus those waters north of Point Bede which are west of a line from the eastern most point of Jakolof Bay north of the westernmost point of Hesketh Island including Jakolof Bay and south of a line west of Hesketh Island and the waters south of Point Bede which are west of the easternmost point of Rocky Bay, which are in Lower Cook Inlet. These are areas where the Joint Board found subsistence fishing and hunting to be a principal characteristic of the economy, culture, and way of life, the standard established by Alaska statute (AS 16.05.258(c)) to identify areas where subsistence hunting and fishing will be permitted.

Cook Inlet communities outside the nonsubsistence area include Skwentna (population 111 in 2000), Alexander (population 39), Tyonek (population 193), Seldovia (population 430), Port Graham (population 171), and Nanwalek (population 177). These communities have economic attributes directly linked to decisions regarding management of the subsistence fisheries and related access to those fisheries.

Outside the nonsubsistence area, the Alaska Board of Fisheries is required to identify fish stocks with customary and traditional uses and adopt regulations that provide a reasonable opportunity for subsistence uses of those stocks. If the harvestable surplus for any fish stock with customary and traditional uses is not sufficient to provide opportunities for all consumptive uses, non-subsistence uses must be restricted or eliminated before restricting subsistence fishing opportunities (AS 16.05.258). All Alaska residents are eligible to participate in authorized subsistence fisheries.

The Alaska Board of Fisheries has adopted regulations for 4 subsistence salmon fisheries in the Cook Inlet Area. Brief descriptions follow. For more detail, see Fall et al. 2007.

1. Port Graham and Koyuktolik Subdistricts. This subsistence setnet salmon fishery is located along the southern shore of outer Kachemak Bay in the Port Graham and Koyuktolik subdistricts of the Southern District and, beginning in 2002, the Port Chatham and Wind Bay subdistricts. Two Alaska Native communities, Nanwalek and Port Graham, are located in the Port Graham Subdistrict, and residents of these communities are the primary participants in the fishery. The recent (2001 to 2005) annual harvest for this fishery was 8,000 salmon. For a detailed description of this subsistence fishery and other subsistence harvests and uses in Nanwalek and Port Graham, see Stanek (1985).

2. Seldovia Subsistence Salmon Fishery. This setnet fishery is located on the south side of Kachemak Bay in the vicinity of the community of Seldovia in the Southern District of the Lower Cook Inlet Area. It targets Chinook salmon runs passing through lower Cook Inlet and a separate enhanced Chinook run returning to Seldovia Bay. Coho salmon are targeted in a fall fishery. Most participants in the fishery live in Seldovia. The recent (2001 – 2005) annual harvest in this fishery was 342 salmon.

3. Tyonek Subdistrict Subsistence Salmon Fishery. This subsistence setnet fishery is located in the Tyonek Subdistrict of the Northern District of upper Cook Inlet. The subdistrict includes the area from one mile south of the mouth of the Chuitna River south to the eastern-most part of Granite Point and from the mean high tide to the mean lower low tide. Most fishery participants live in Tyonek. From 2001 through 2005, the average annual harvest in the fishery was 1,346 salmon, mostly Chinook salmon. For a detailed discussion of this fishery and other subsistence uses at Tyonek, see Fall et al. (1984).

4. Upper Yentna River Subsistence Fish Wheel Fishery. This is a subsistence fish wheel fishery that began in 1996 as a personal use fishery and was reclassified as a subsistence fishery by the Board of Fisheries beginning in 1998. It is located in the main stem of the Yentna River from its confluence with Martin Creek upstream to its confluence with the Skwentna River. Legal gear includes a fish wheel with a live box. Over half the participants are residents of the Skwentna area. From 2001 through 2005, the average annual harvest was 553 salmon.

#### References:

Fall, James A., Dan J. Foster, and Ronald T. Stanek. 1984. The Use of Fish and Wildlife Resources in Tyonek, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 105. Juneau.

Fall, James A., Dave Caylor, Michael Turek, Caroline Brown, James Magdanz, Tracie Krauthoefer, Jeannie Heltzel, and David Koster. 2007. Alaska Subsistence Salmon Fisheries 2005 Annual Report. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 318. Juneau.

Stanek, Ronald T. 1985. Patterns of Wild Resource Use in English Bay and Port Graham, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 104. Juneau.

Table XX. Historic Subsistence Salmon Harvests, Port Graham and Koyuktolik Subdistricts, 1981-2005.

YEAR	PERMITS		REPORTED SALMON HARVEST					TOTAL
	ISSUED	RETURNED	CHINOOK	SOCKEYE	COHO	CHUM	PINK	
1981		57	138	2,670	825	177	874	4,684
1982		61	124	2,354	1,493	220	2,932	7,123
1983		46	67	2,480	471	95	187	3,300
1984		24	45	3,262	510	6	673	4,496
1985		24	146	1,177	621	26	345	2,315
1986		44	125	647	481	14	1,062	2,329
1987		55	21	901	914	114	714	2,664
1988		48	104	1,021	844	110	1,756	3,835
1989		44	51	157	1,155	74	1,495	2,932
1990		60	265	1,162	1,417	151	2,960	5,955
1991		63	163	688	2,053	221	4,587	7,712
1992		71	200	535	1,150	236	1,421	3,542
1993		56	277	1,148	913	257	2,663	5,258
1994		70	300	830	1,370	504	1,979	4,983
1995		87	585	1,795	538	376	1,273	4,567
1996		75	310	1,744	939	276	749	4,018
1997		26	202	325	203	153	511	1,394
1998		19	169	289	243	240	459	1,400
1999		74	485	3,157	1,747	1,104	2,023	8,516
2000		67	259	4,664	1,831	953	1,606	9,313
2001		49	133	1,085	1,295	228	1,454	4,195
2002		79	346	10,620	1,057	488	1,831	14,342
2003		52	465	5,534	1,006	532	1,572	9,109
2004		80	312	3,525	1,303	213	1,600	6,953
2005		68	292	2,126	1,193	180	1,608	5,399
5-Year								
Average		66	310	4,578	1,171	328	1,613	8,000
10-Year								
Average		59	297	3,307	1,082	437	1,341	6,464
All Years								
Average		56	223	2,156	1,023	278	1,533	5,213

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

Table XX. Historic Subsistence Salmon Harvests, Seldovia Fishery, 1996-2005.

YEAR	PERMITS		ESTIMATED SALMON HARVEST					TOTAL
	ISSUED	RETURNED	CHINOOK	SOCKEYE	COHO	CHUM	PINK	
1996	43	42	51	9	0	0	0	60
1997	20	17	52	22	0	0	0	74
1998	22	20	143	65	0	8	0	216
1999	16	16	136	130	0	38	0	304
2000	22	22	179	252	0	16	0	447
2001	19	16	149	142	0	0	0	290
2002	20	20	124	234	13	11	31	413
2003	18	15	117	290	2	66	22	496
2004	14	12	102	69	5	18	65	258
2005	18	16	53	74	14	11	100	251
5-Year								
Average	18	16	109	162	7	21	43	342
All Years								
Average	21	20	110	129	3	17	22	281

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

Table XX. Historic Subsistence Salmon Harvests, Tyonek Subdistrict, 1980-2005.

YEAR	PERMITS		REPORTED SALMON HARVEST					TOTAL
	ISSUED	RETURNED	CHINOOK	SOCKEYE	COHO	CHUM	PINK	
1980	67		1,757	235	0	0	0	1,992
1981	70		2,002	269	64	32	15	2,382
1982	69		1,590	310	113	4	14	2,031
1983	75		2,665	187	59	6	0	2,917
1984	75		2,200	266	79	23	3	2,571
1985	76		1,472	164	91	10	0	1,737
1986	65		1,676	203	223	46	50	2,198
1987	64	61	1,610	166	149	24	10	1,959
1988	47	42	1,587	91	253	12	8	1,951
1989	49	47	1,250	85	115	1	0	1,451
1990	42	37	781	66	352	12	20	1,231
1991	57	54	902	20	58	0	0	980
1992	57	44	907	75	234	19	7	1,242
1993	62	54	1,370	57	77	17	19	1,540
1994	58	49	770	85	101	22	0	978
1995	70	55	1,317	45	153	15	0	1,530
1996	73	49	1,039	68	137	7	21	1,272
1997	70	42	639	101	137	8	0	885
1998	74	49	1,027	163	64	2	1	1,257
1999	77	54	1,230	144	94	11	32	1,511
2000	60	59	1,157	63	87	0	6	1,313
2001	84	58	976	172	49	6	4	1,207
2002	101	71	1,080	209	115	4	9	1,417
2003	87	74	1,183	111	44	10	7	1,355
2004	97	75	1,345	93	130	0	0	1,568
2005	78	66	982	61	139	2	0	1,184
5-Year								
Average	89	69	1,113	129	95	4	4	1,346
10-Year								
Average	80	60	1,066	119	100	5	8	1,297
All Years								
Average	69	55	1,327	135	120	11	9	1,602

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

Table XX. Historic Subsistence and Personal Use Salmon Harvests, Upper Yentna Fishery, 1996-2005.<sup>1</sup>

YEAR	PERMITS		ESTIMATED SALMON HARVEST					
	ISSUED	RETURNED	CHINOOK <sup>2</sup>	SOCKEYE	COHO	CHUM	PINK	TOTAL
1996	17	17	0	242	46	51	115	454
1997	24	21	0	549	83	10	30	672
1998	21	18	0	495	113	15	30	653
1999	18	16	0	516	48	13	18	595
2000	19	19	0	379	92	7	4	482
2001	16	15	0	545	50	4	10	608
2002	25	22	0	454	133	31	14	632
2003	19	15	0	553	67	8	2	630
2004	21	19	0	441	146	3	36	625
2005	18	17	0	177	42	25	24	268
5-Year Average	20	18	0	434	87	14	17	553
All Years Average	20	18	0	435	82	17	28	562

<sup>1</sup> This fishery was classified as personal use in 1996 and 1997; it has been a subsistence fishery since 1998.

<sup>2</sup> Regulations prohibit the retention of chinook salmon in this fishery (5 AAC 01.593).

SOURCE: Alaska Department of Fish and Game, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

### Recreational and Personal Use Fisheries

The following three marine sport and personal use fisheries are examples of the broad attributes of sustainable managed fishing effort and harvest in Cook Inlet. Additional information regarding guides and businesses involved in these fisheries may be available from the required guide/charter registration and logbook program. The fisheries and descriptions are:

1. Turnagain Arm hooligan personal use dipnet fishery open only to Alaska residents, occurs in upper Turnagain Arm and Twentymile River from mid-May to late June. Fishing effort and harvest information is available in the Statewide Harvest Survey reports and recent Anchorage Area Management Report.
2. Central Cook Inlet marine recreational fishery primarily targets halibut and Chinook salmon, some coho salmon; occurs from mid-May through August, with most effort mid-May through July. Most boats launch from Deep Creek and Anchor River on the Kenai Peninsula, with some effort occurring by fishermen launching at Homer. Guides/charters and area businesses (Kasilof south to Anchor Point and to some degree Homer) are dependent on these fisheries. Effort and harvest information is in the Statewide Harvest Survey reports and recent North Kenai Peninsula Area Management Report.

3. Lower Cook Inlet marine recreational fishery primarily targets halibut and Chinook salmon, some rockfish; occurs nearly year-round with most effort May-August targeting mostly halibut, though some Chinook effort, and lower levels of effort September-April targeting feeder Chinook. Most fishermen launch from Homer and Seldovia. Guide/charters and area businesses in Homer/Kachemak Bay are dependent on these fisheries. Effort and harvest information is in the Statewide Harvest Survey reports, recent Lower Cook Inlet Area Management Report, and Groundfish Area Management Report.

The salmon personal use fishery primarily occurs at the mouth of the Kenai and Kasilof rivers, with set net personal use fishery in marine waters near the mouth of the Kasilof. The fishery takes place from mid-June to mid-August, with most effort from late-June to end of July. Guiding is minor, but businesses in the Kenai, Soldotna, and Kasilof area are intensively involved. Effort and harvest information is in recent Upper Kenai Peninsula Area Management Reports and a report by Reimer and Sigurdsson.

The Alaska Department of Fish and Game contracted to provide an estimate of the economic impact of sport fishing activities within the Cook Inlet region for the 1993 fishing year. The estimates contained within the report are based on data that is now over a decade old, so the economic estimates contained in the report are likely underestimates of the current economic impact of fishing activities. The report is available at <http://www.iser.uaa.alaska.edu/ResourceStudies/sportfishing.htm>.

In March 2006, the University of Alaska Institute of Social and Economic Research (ISER) published a report under contract with the Kenai River Sport Fishing Association, which focused on estimating the economic benefits of sport fishing, personal use, and commercial fishing in Upper Cook Inlet. The economic estimates in the report were developed by aggregating available information from a variety of sources (including the Department's 1993 economic study) to produce updated estimates based upon several economic assumptions (KRSA 2006). The National Marine Fisheries Services (NMFS) has also conducted several recent economic studies within south central Alaska and Cook Inlet, focusing on recreational saltwater fisheries. The economic estimates associated with sport fishing in Alaska produced by these and other studies, along with the methodology used, scope of work, are summarized in a historical spreadsheet prepared by Department staff below. A summary of the available economic impact of just salmon sport fishing in the south central region and for Upper Cook Inlet waters in 1993 and 2003 is noted in the following table below (KRSA 2006).

In 2008, the Department released updated estimates of the economic impact of sport fishing specific to the Cook Inlet region in 2007. Results estimated that anglers spent 1,243,098 days fishing in the Cook Inlet region and spent \$732,968,975 dollars. Further details are described in the report (Southwest Associates et. al. 2008).

<b>Economic Contribution</b>	<b>1993<sup>1</sup></b>	<b>2003<sup>2</sup></b>
<b>A. Total Expenditures<sup>3</sup></b> (millions \$)		
Southcentral Alaska	338	415
Upper Cook Inlet salmon	N/A	246
<b>B. Total Payroll<sup>4</sup></b> (millions \$)		
Southcentral region	139	171
Upper Cook Inlet salmon	N/A	95
<b>C. Average Annual Jobs<sup>5</sup></b>		
Southcentral region	6,100	6,100
Upper Cook Inlet salmon	N/A	3,400
<b>D. Net Economic Value<sup>6</sup></b> (millions \$)		
Upper Cook Inlet salmon	86	104
<b>E. Total Net Economic Value<sup>7</sup></b>		
Upper Cook Inlet salmon	N/A	350

<sup>1</sup> Source: ISER 1999

<sup>2</sup> Source: ISER 2006

<sup>3</sup> Direct expenditures by anglers for costs related to sport and personal use fishing

<sup>4</sup> Total wages and salaries generated by direct and indirect spending arising out of sport fishing activity.

<sup>5</sup> Total average annual (full time equivalent) jobs created by direct and indirect effects of sport fishing expenditures.

<sup>6</sup> collective economic gain attributable to residents and nonresidents measured as the monetary value that participants place on the benefits they receive from fishing over and above the cost of going fishing

<sup>7</sup> total direct spending (expenditures plus net economic value for residents and non-residents)

The Department maintains a current database of the number of license sport fishing guides and guide businesses in the Guide Licensing Database. In 2006, the following counts of sport fishing guide business for Cook Inlet (by water type) were available:

**685** = the total number of licensed guide businesses in communities around Cook Inlet in 2006

**295** = the total number of licensed guide businesses that operated in saltwater in 2006<sup>a</sup>

**358** = the total number of licensed guide that operated in freshwater in 2006<sup>b</sup>

<sup>a</sup> some guided businesses based in one community may actually operate in non-Cook Inlet saltwaters (i.e., North Gulf Coast or Prince William Sound)

<sup>b</sup> I did not analyze what fishery/what freshwaters these businesses fished in and thus the count may include business that operate in non-Cook Inlet based freshwater fisheries.

Detailed lists of the guide businesses by community and water type are available from the ADF&G Guide Licensing Database as well.

The following references provide additional information on Economics of Sport Fishing in Alaska. Although several address sport fishing economics in parts of Alaska outside of Cook Inlet, the methodology and information sources should be helpful to any analysis conducted on economic attributes of sport fishing.

1. ADF&G Guide License Database, 2006. Summary data provided by K. Brogdon.
2. Coughenower, D. D. 1986. Homer, Alaska Charter Fishing Industry Study. University of Alaska Marine Advisory Program, Marine Advisory Bulletin #22.
3. Haley, S.; Berman, M.; Goldsmith, S.; Hill, A., and Kim, H. 1999. *Economics of Sport Fishing in Alaska*. (Institute of Social and Economic Research, University of Alaska Anchorage). Prepared for the Alaska Dept. of Fish and Game. (copy available from UAA: <http://www.iser.uaa.alaska.edu/ResourceStudies/sportfishing.htm>  
\*\*NOTE Department disclaimer in beginning of report and executive summary
4. Jones and Stokes, Inc & ASK Marketing and Research Group. 1991. *Southeast Alaska Sport Fishing Economic Study*. Prepared for the Alaska Dept of Fish and Game. (full text .pdf)
5. Jones and Stokes, Inc. 1987. *Juneau Area Sport Fishing Economic Study*. Prepared for the Alaska Dept of Fish and Game. (full text .pdf)
6. Jones and Stokes, Inc. 1987. *Southcentral Alaska Sport Fishing Economic Study*. Prepared for the Alaska Dept of Fish and Game. (full text .pdf)
7. Kenai River Sportfishing Association (KSRA). 2006. Economic Values of Sport, Personal Use and Commercial Salmon Fishing in Upper Cook Inlet. March 2006
8. Lee, S. T.; Herrmann, M.; Wedin, I.; Criddle, K.; Hamel, C., and Greenberg, J. (Alaska Fisheries Science Center, NMFS), 1999. Summary of Angler Survey of Saltwater Sport Fishing off the Kenai Peninsula, Alaska  
[http://www.afsc.noaa.gov/refm/Socioeconomics/current\\_research.htm](http://www.afsc.noaa.gov/refm/Socioeconomics/current_research.htm)
9. Southwick Associates Inc. and W.J. Romberg, A.E. Bingham, G.B Jennings, and R.A. Clark. 2008. Economic impacts and contributions of sport fishing in Alaska, 2007. Alaska Department of Fish and Game, Professional Paper No. 08-01, Anchorage.

Selected Economic Studies of Alaska Sport Fisheries: Statewide and regional economic impact and value estimates

Study Year	Study	(year \$)	Sub-Regional Economic Impact & Value Estimates																	Referenced Page(s)		
			Economic Impact Estimates (Statewide)					Southcentral Alaska -- (Region II)					Cook Inlet (or Lower, Central or Upper Cook Inlet)									
			Type of Expenditure(s)	Total Expenditure	Retail Sales	Earnings (payroll)	Jobs <sup>a</sup>	Total Economic	Total Expenditures	Retail Sales	Earnings (payroll)	Jobs <sup>a</sup>	Total Economic	NEV	Total Expenditures	Retail Sales	Earnings (payroll)	Jobs <sup>a</sup>	Total Economic		NEV	
2006	Economic value of Bristol Bay wild salmon watersheds	2005 \$	Total local resident																		Exec Summary p15-25	
			Total non-local (AK) resident																			
			Total non-resident																			
			Total (all anglers)																			
2003	Economic Value of Sport, Personal Use, and Commercial Salmon Fishing in Upper Cook Inlet	2003 \$	Recreational salmon fishing (UCI)												\$246,000,000	\$290,000,000	\$95,000,000	3,400	\$350,000,000	\$104,000,000	p13	
			All Recreational fishing (Southcentral)						\$415,000,000	\$532,000,000	\$171,000,000	6,100										p9
2003	National FWHAR Survey--ASA analysis	2003 \$	Total (Statewide)	\$562,000,000	\$640,167,515	\$259,556,537	12,065	\$1,046,706,782													link on ADFG site to ASA	
2001 <sup>c</sup>	National FWHAR Survey--ASA analysis	2001 \$	Total (Statewide)	\$537,355,000	\$587,028,597	\$238,011,311	11,064	\$959,821,921													link on ADFG site to ASA	
1997	Linking sport fishing trip attributes, participation decisions, and regional economic impacts in Lower and Central Cook Inlet	1997 \$	Avg. daily expenditures for marine fishing only (halibut/salmon): local residents (Ken. Penin. Borough) non-local AK residents non-residents												\$28,500,000 (halibut/marine salmon only)							
1996 <sup>c</sup>	National FWHAR Survey--USFWS	2001 \$	Total (Statewide)	\$495,717,000	not provided	not provided	not provided	not provided													15	
1996	Duffield, Neher, Merritt (2002) (Reg III only)	1996 \$	Total (Reg III & 5 sub-regions)																		\$28,809,984 p. 170 table 13.6	
1993-1994	ISER Statewide Study <sup>d</sup>	1993 \$	Total resident	\$340,952,485	\$351,131,867	\$127,173,159	5,524	\$241,371,583	\$261,933,586	\$92,180,137	3955										Halley et al ES 10-12 (direct & indirect) Tables 4-2,4-7, 4-11 for econ impact, statewide, resident, and by region	
			Total nonresident	\$198,664,560	\$286,116,293	\$82,234,558	3,712	\$137,528,436	\$205,935,594	\$58,430,077	2620											P 5-5, Table 5.1 (total NEV), p5-8
			Total (Statewide & 4 Regions)	\$539,617,045	\$637,248,160	\$209,407,717	9,236	\$378,900,019	\$467,869,180	\$150,610,214	6,575	not provided	\$136,859,545									
1991 <sup>c</sup>	National FWHAR Survey--USFWS	2001 \$	Total (Statewide)	\$311,389,000																	15	
1988	Jones and Stokes Southeast Study	1988 \$	Resident																		Table 8-1, 7-24	
			Non-resident																		Table 8-1, 7-24	
			Total																		Table 8-1, 7-24	
1986	Jones and Stokes Southcentral Study	1986 \$	Resident					\$74,163,000							\$246,391,000						4-2, Table 4.1	
			Non-resident					\$52,892,000							\$30,385,000						4-2, Table 4.1	
			Total					\$127,055,000	---	\$65,276,000	2,840				\$276,776,000						4-15, Table 4.10	

<sup>a</sup> Direct and indirect jobs (full-time equivalents)

<sup>b</sup> The basis for arriving at these totals is not identified in the sources cited

## **Commercial Fishing**

According to the Alaska Department of Commerce, Community and Economic Development, the economic impacts and economic attributes involving the Alaska Department of Fish and Game's closely regulated and sustainable management of commercial salmon fishing in Cook Inlet would be significant. For example, the combined salmon harvests of Upper and Lower Cook Inlet range between three and six million total salmon in any given year. In the Upper Cook Inlet, this includes the valuable sockeye salmon, which in 2006 were worth \$12.3 million or about 90% of the total ex-vessel value to fishermen. In 2006, Upper Cook Inlet total salmon ex-vessel harvest was worth \$13.72 million. Lower Cook Inlet total ex-vessel harvest last year was worth \$1.9 million. Total Cook Inlet salmon (ex-vessel) value was \$15.6 million, just slightly above the recent 5-year average:

5-Year Average Harvest Value: \$14.7 million

5-Year Average Permits Fished: 982

5-year Average Harvest (# of salmon): 5.3 million

The ex-vessel value does not include the significant multiplicative effect of the economic activity generated by commercial fishing operations in the region. This role supports retail for groceries and supplies in the communities, employment and business in seafood processing, the portion of the salmon prices that is automatically contributed to communities for schools and other infrastructure, transportation for fishermen and fish, service providers, fuel, housing, etc.

Details of the economics and attributes of the commercial fisheries follow:

Historically, commercial fishing activity has occurred in Cook Inlet well before Statehood in 1959. The first documented report of commercial fishing began in the 1880s and continues today. The commercial fishing industry located in Cook Inlet contributes significantly to the overall economy of the South Central region of the state.

Salmon fishing comprises the majority of the harvest and value of present day commercial fishing activity in Cook Inlet. During the most recent ten years (1997–2006) over 286 million pounds of salmon have been processed in Cook Inlet for a combined exvessel value of nearly \$189 million dollars. During 2006 alone, 481 salmon set gillnet permits, 396 salmon drift gillnet permits and 24 salmon purse seine permits fished.

The Pacific cod and herring fisheries represent two additional commercial fisheries in Cook Inlet. Pacific cod fisheries in Alaska are managed by both the federal and state governments. State-managed fisheries for Pacific cod began in 1997 and are distinct from the parallel fisheries. Parallel fisheries for Pacific cod occur in state waters at the same time as the federal fisheries in Cook Inlet and harvest against the federal total allowable biological catch. State-managed Pacific cod fisheries allow only pot and jig

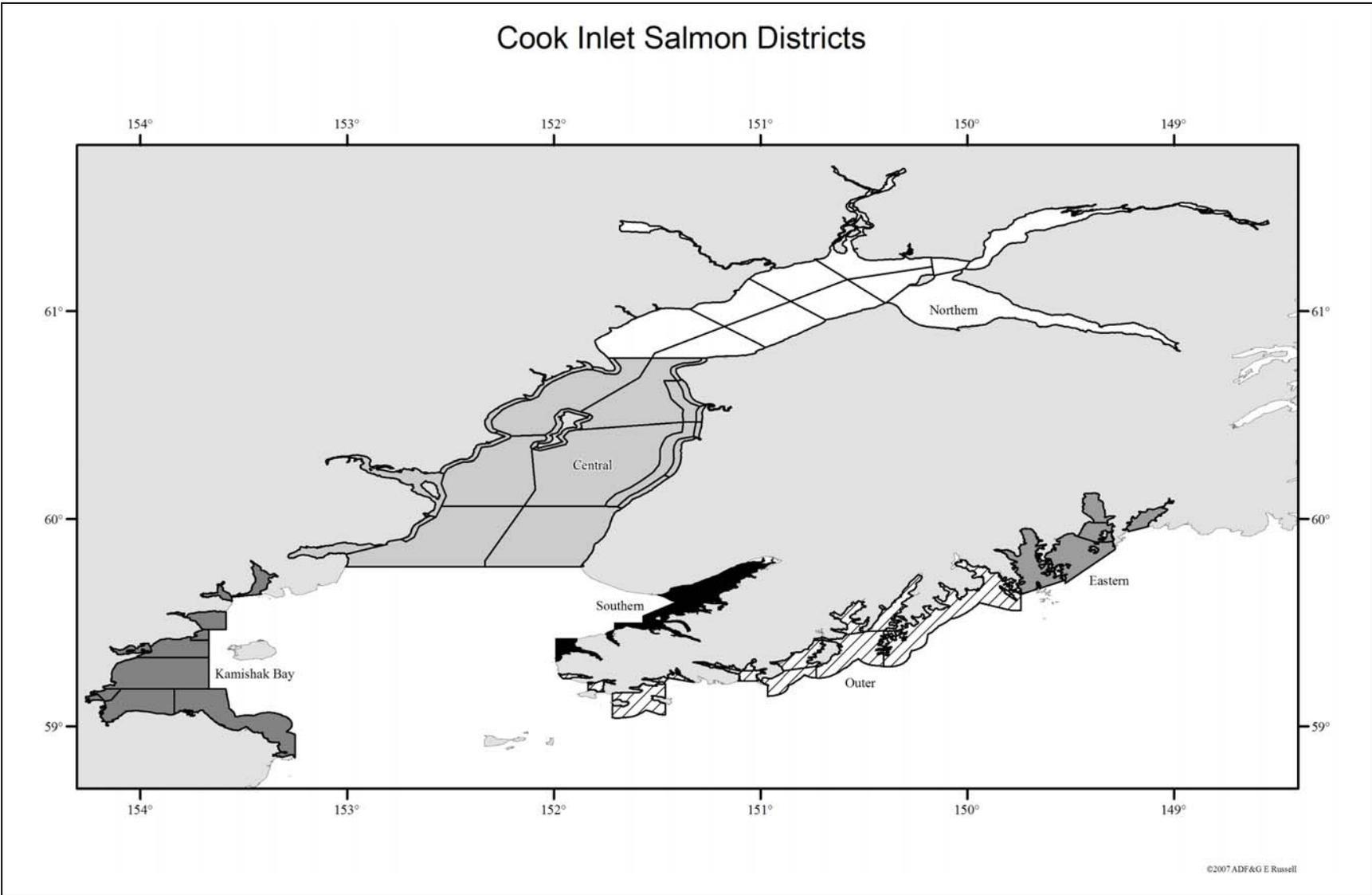
gear types to harvest against a fixed portion of the total allowable biological catch that is allocated to the State fisheries.

The Pacific cod fishing fleet has decreased from 167 vessels with a harvest of 4.1 million fish in 1997 to 56 vessels with a harvest of 2 million fish in 2006.

Limited commercial herring fishing activity occurs in Cook Inlet. There has not been a directed herring purse seine opening since 1998. On average, about one dozen permits participate annually in the herring roe gillnet fishery.

The Cook Inlet area is subdivided into the Upper Cook Inlet (UCI) and Lower Cook Inlet (LCI) management areas.

# Cook Inlet Salmon Districts



**Figure 1.**—Map of Upper and Lower Cook Island salmon districts.

## UPPER COOK INLET

The UCI management area consists of that portion of Cook Inlet north of the latitude of Anchor Point and is divided into the Central and Northern Districts (Figure 2). The Central District is approximately 75 miles long, averages 32 miles in width, and is further subdivided into six subdistricts. The Northern District is 50 miles long, averages 20 miles in width and is divided into two subdistricts. At present, 5 species of Pacific salmon (*Oncorhynchus*) and Pacific herring (*Clupea harengus pallasii*) represents the majority of commercial harvest in UCI.

### SALMON

Since the inception of a commercial fishery in 1882, many gear types, including fish traps, gillnets, and seines, have been employed with varying degrees of success to harvest salmon in UCI. Currently, set (fixed) gillnets are the only gear permitted in the Northern District, while both set and drift gillnets are used in the Central District. The use of seine gear is restricted to the Chinitna Bay Subdistrict, where they are employed sporadically. Drift gillnets have accounted for approximately 50% of the average annual salmon harvest since 1966, with set gillnets harvesting virtually all of the remainder.

**Table 1.**—Upper Cook Inlet, Northern District, Set Gillnet Harvest and Exvessel Value, 1997–2006 (Fish Ticket Database).

Year	Landed Pounds	Exvessel Value
1997	1,023,976	\$749,036
1998	717,594	\$621,326
1999	605,787	\$617,550
2000	908,498	\$584,791
2001	670,772	\$329,274
2002	642,698	\$241,633
2003	498,564	\$265,412
2004	502,437	\$275,424
2005	398,463	\$305,822
2006	276,322	\$280,135

**Table 2.**—Upper Cook Inlet, Central Drift and Set Gillnet Harvest and Exvessel Values, 1997–2006 (Fish Ticket Database).

Year	Landed Pounds	Exvessel Value
1997	28,785,455	\$28,130,959
1998	10,110,898	\$8,024,097
1999	17,466,194	\$21,637,725
2000	10,831,508	\$8,125,889
2001	12,102,197	\$7,418,666
2002	23,065,366	\$11,050,202
2003	22,107,296	\$13,829,443
2004	34,597,003	\$21,985,901
2005	34,204,671	\$31,285,685
2006	14,710,139	\$13,546,652

### HERRING

Commercial herring fishing began in UCI in 1973 with a modest harvest of bait-quality fish along the east side of the Central District and expanded in the late 1970s to include small-scale sac roe fisheries in Chinitna and Tuxedni bays. In 1988, significant decreases in herring abundance were observed in Tuxedni Bay, as well as a shift towards older age class herring, resulting in the closure of Tuxedni Bay to commercial herring fishing prior to the 1992 season. In Chinitna Bay and along the eastside beaches, similar declines began to materialize after the 1990 season.

In 1998 the Upper Subdistrict of the Central District and the Eastern Subdistrict of the Northern District were opened to commercial herring fishing to assess the status of the herring population. The herring fisheries on the west side of Cook Inlet remained closed until the status of the east side stocks was determined.

The Central District Herring Recovery Management Plan, which became active prior to the 1999 season, limited herring fishing in UCI to the waters of the Upper, Western, and Chinitna Bay Subdistricts. In the Upper Subdistrict, fishing for herring is not allowed within 600 feet of the mean high tide mark on the Kenai Peninsula to reduce the interception of salmon. The management plan was amended by the Board of Fisheries (BOF) prior to the 2002 fishing season, extending the closing date for the fishery an additional 11 days to May 31.

In 2001, samples of herring were collected in Chinitna and Tuxedni Bays. Age, sex, and size distribution of the samples revealed that the years of closed fishing in these areas had resulted in an increase of younger fish being recruited into the population. As a result of these analyses, and in accordance with the herring management plan, the commercial fishery was reopened in 2002 in both the Chinitna Bay and Western Subdistricts. The management plan allowed for a very conservative harvest quota, not to exceed 40 and 50 tons, respectively. There has been very little participation in either fishery since they were reopened. However, there has been limited food/bait harvest in the Central District in 1999, and from 2002 through 2004.

Because the glacial waters of UCI preclude the use of aerial surveys to estimate the biomass of herring stocks, management of these fisheries has departed from the standard techniques employed in the more traditional herring fisheries. Gillnets are the only legal gear for herring in UCI, with set gillnets being used almost exclusively. This gear type is significantly less efficient at capturing herring than purse seines. Moreover, conservative guideline harvest levels have been set, which provide for a low-level commercial fishery on these stocks. In the Upper Subdistrict, harvests are generally concentrated in the Clam Gulch area, with very little or no participation in either the Western Subdistrict (Tuxedni Bay), Chinitna Bay, or Kalgin Island subdistricts.

**Table 3.**—Upper Cook Inlet, herring harvest by fishery, 1997–2006 (from Area Management Reports) Harvest (tons).

Year	Upper Subdistrict	Chinitna Bay	Tuxedni Bay	Kalgin Island	Total
1997	-	-	-	not open	-
1998	19.5	-	-	not open	19.5
1999	10.4	-	-	not open	10.4
2000	14.7	-	-	not open	14.7
2001	9.9	-	-	not open	9.9
2002	16.2	1.9	0	not open	18.1
2003	3.7	0	0	not open	3.7
2004	6.7	0.1	0	not open	6.8
2005	17.1	0.2	0	0	17.3
2006	14.4	0	0	0	14.4

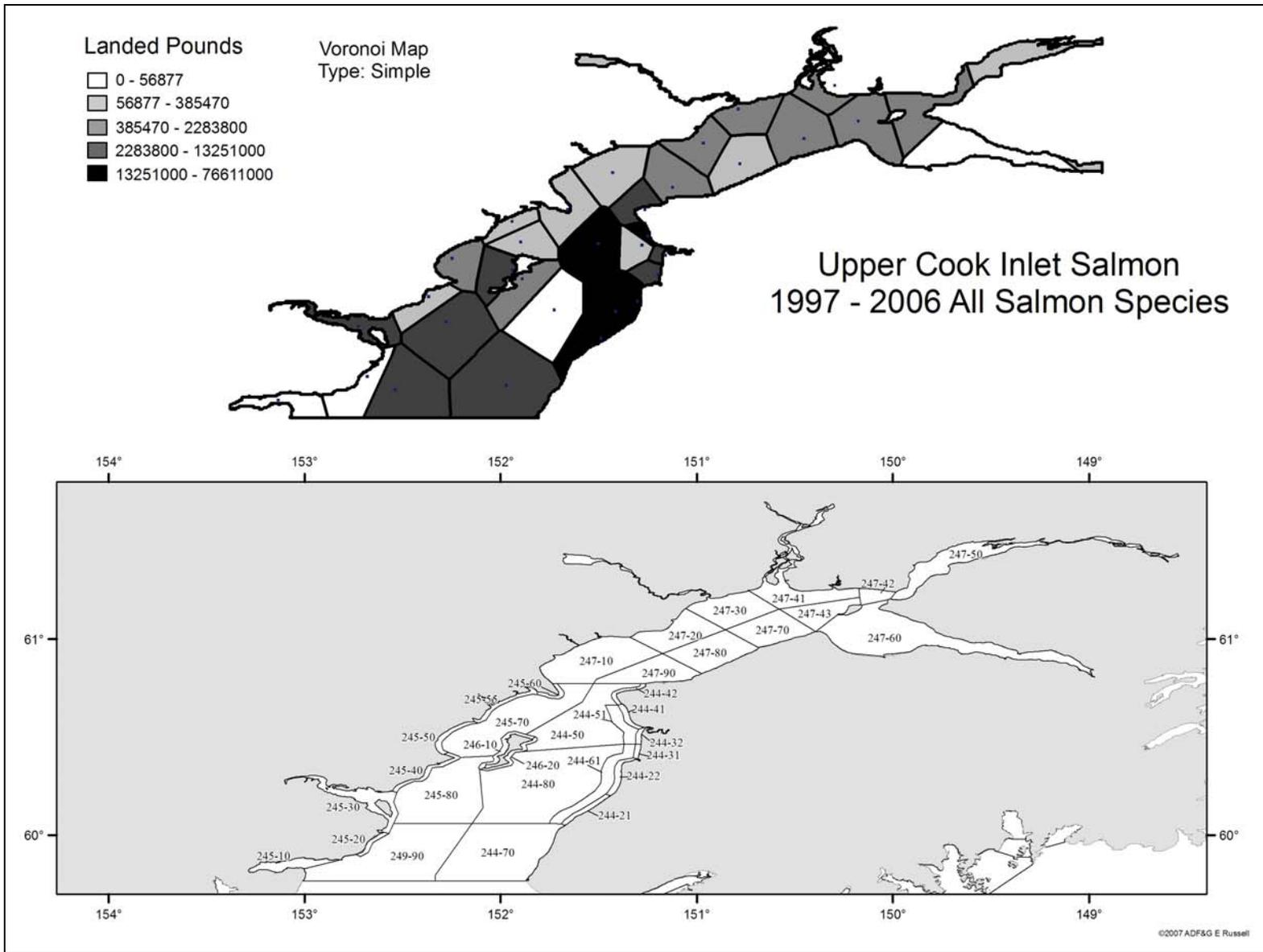


Figure 2.—Map of Upper Cook Inlet salmon.

## LOWER COOK INLET

The Lower Cook Inlet (LCI) management area, comprised of all waters west of the longitude of Cape Fairfield, north of the latitude of Cape Douglas, and south of the latitude of Anchor Point, is divided into five commercial salmon fishing districts (Figure 3). The Barren Islands District is the only fishing district where no salmon fishing occurs, with the remaining four districts (Southern, Outer, Eastern, and Kamishak Bay) separated into approximately 40 subdistricts and sections to facilitate management of discrete stocks of salmon.

### SALMON

Chinook and coho salmon are not normally commercially important species. However, the set gillnet fleet comprises the majority of the Chinook salmon catch. While sockeye salmon harvests are experiencing lower than average harvests in recent years, pink (the dominant salmon species in numbers of fish) and chum salmon harvests are higher than average. Participation levels in the salmon set net fishery remain low, while participation levels in the purse seine fleet show a slight increase in recent years.

**Table 4.**—Lower Cook Inlet, Common Property Purse Seine Salmon Harvest and Exvessel Values, 1997–2006 (from Area Management Reports).

Year	Landed Pounds	Exvessel Value
1997	1,617,995	\$805,657
1998	2,851,252	\$1,051,642
1999	2,272,343	\$1,968,502
2000	2,384,579	\$984,217
2001	1,893,655	\$715,855
2002	4,800,041	\$738,127
2003	3,547,954	\$1,430,798
2004	2,351,568	\$699,856
2005	1,944,024	\$738,082
2006	5,630,979	\$1,356,471

**Table 5.**—Lower Cook Inlet Set Gillnet Salmon Harvest and Exvessel Values, 1997–2006 (from Area Management Reports).

Year	Landed Pounds	Exvessel Value
1997	683,965	\$368,041
1998	294,248	\$198,051
1999	229,596	\$314,989
2000	298,197	\$211,065
2001	268,525	\$155,937
2002	377,832	\$223,203
2003	581,860	\$389,717
2004	132,445	\$145,887
2005	120,675	\$137,718
2006	170,473	\$179,602

**Table 6.**—Lower Cook Inlet, Hatchery (Purse Seine & Weir) Salmon Harvest and Exvessel Values, 1997–2006 (from Area Management Reports).

Year	Landed Pounds	Exvessel Value
1997	7,688,209	\$1,233,686
1998	2,858,569	\$737,860
1999	2,714,379	\$732,350
2000	2,844,575	\$576,936
2001	1,597,130	\$358,159
2002	3,399,702	\$386,890
2003	2,246,126	\$361,024
2004	8,694,295	\$402,629
2005	7,668,315	\$732,809
2006	1,277,477	\$375,903

**Table 7.**—Lower Cook Inlet, Derby Salmon Harvest and Exvessel Values, 1997–2006 (from Area Management Reports).

Year	Landed Pounds	Exvessel Value
1997	19,517	\$14,052
1998	22,993	\$14,945
1999	11,607	\$7,545
2000	21,959	\$14,273
2001	18,318	\$7,877
2002	24,293	\$10,446
2003	26,751	\$10,700
2004	35,999	\$18,000
2005	31,124	\$18,052
2006	15,920	\$10,348

## HERRING

Since 1973, the majority of LCI sac roe herring harvest and effort has occurred within the Kamishak Bay District. With the exception of a test fishery in 1999, there has been no directed commercial herring fishery since 1998 because the spawning biomass has been below the threshold of 6,000 set before a commercial sac roe harvest can be considered for Kamishak Bay.

## PACIFIC COD

Historically, the Cook Inlet area commercial Pacific cod fishery was managed via emergency order to coincide with seasons in the adjacent federal Central Gulf of Alaska area (CGOA). The Cook Inlet Pacific Cod Management Plan (5 AAC 28.367), first effective in 1997, defines two seasons, a “parallel season” and a “state waters season.” Similar to historical seasons, the parallel season is set by emergency order to coincide with the federal CGOA fishery for Pacific cod with respect to season dates and allowable gears—provided those gear types are legal for state waters. The state waters season occurs 24 hours after the parallel season closes, but with allowable gear types restricted to pot or jig (mechanical or hand) and with an annual allocation equal to 3.75% of the federal CGOA allowable biological catch. Season dates for these fisheries are shown in Table 9.

Annual Pacific cod harvests in the Cook Inlet Area have declined sharply since 1999 due primarily to a shift of longline effort from Cook Inlet to the Kodiak management area. Since 2002, overall harvest has remained somewhat stable at between 2.0 million and 2.5 million pounds, primarily from pot gear. The number of vessels in the pot fishery has ranged from 25 in 1999 to 10 from 2001 to 2003. The 2007 harvest is expected to be comparable to recent years.

**Table 8.**—Cook Inlet Area commercial Pacific cod harvest by gear type and estimated exvessel values, 1997–2006.

Year	Vessels	Landings	Jig/troll	Pot	Longline	Net Gear	Harvest	Value (\$)
1997	167	943	599,309	1,391,096	2,049,394	72,354	4,112,154	1,105,001
1998	143	825	230,662	1,071,615	1,900,375	211,406	3,414,058	810,160
1999	141	786	148,560	2,372,352	2,171,877	8,296	4,701,085	1,724,949
2000	110	748	15,235	1,906,201	815,742		2,737,178	1,105,020
2001	94	452	19,428	1,190,021	301,654		1,511,103	586,390
2002	72	543	19,560	1,618,622	582,635		2,220,817	732,505
2003	56	442	429,684	1,318,484	126,168		1,874,336	693,504
2004	77	423	326,538	2,146,023	27,143		2,499,704	811,610
2005	53	352	90,769	2,394,737	25,720		2,511,226	790,939
2006	56	319	1,406	1,996,728	70,507		2,068,642	883,230

Note: Totals include at-sea discards.

**Table 9.**–Cook Inlet Area Pacific cod season dates, 1997–2006.

Year	Dates and Times <sup>a</sup>	Season and Gears
1997	January 1-March 11; October 2-26	Parallel seasons
	April 4-October 2; October 26-December 31	State season jigs
	April 4-7; June 15-October 2; October 26-December 31	State season pots
1998	January 1-March 1; October 5-9	Parallel seasons
	March 17-October 5; October 9-December 31	State seasons jigs
	March 17-April 7; June 15-October 5; October 9-December 31	State seasons pots
1999	January 1-March 14; September 1-October 5	Parallel seasons
	March 21-September 1, October 5-December 31	State seasons jigs
	March 21-May 1; June 15-September 1; October 5-December 31	State seasons pots
2000	January 1-March 4	Parallel season
	March 5-December 31	State season jigs
	March 5-May 1; June 15-December 31	State season pots
2001	January 1-February 26	Parallel season, longline gear
	January 1-March 4	Parallel season, pot/jig gears
	March 5-December 31	State season jigs
	March 5-May 1; June 15-December 31	State season pots
2002	January 1-March 9	Parallel season
	March 10-December 31	State season jigs
	March 10-May 1; June 15-August 5; September 1-December 31	State seasons pots
2003	January 1-February 9, bycatch till September 9 then closed to retention	Parallel season
	February 10-December 8 (5:00 pm)	State season jigs
	February 10-27 (5:00 pm), September 1-December 8 (5:00 pm)	State seasons pots
2004	January 1-31	Parallel season
	February 1-December 31	State season jigs
	February 1-23 (5:00 pm); September 1-December 31	State seasons pots
2005	January 1-26	Parallel season
	January 27-December 31	State season jigs
	January 27-May 1; June 15-December 31	State seasons pots
2006	January 1-February 28; October 2-December 31	Parallel seasons
	March 1-October 2	State season jigs
	March 1-May 1, June 15-October 2	State seasons pots

<sup>a</sup> All season openings and closures occurred at 12:00 noon unless otherwise noted.

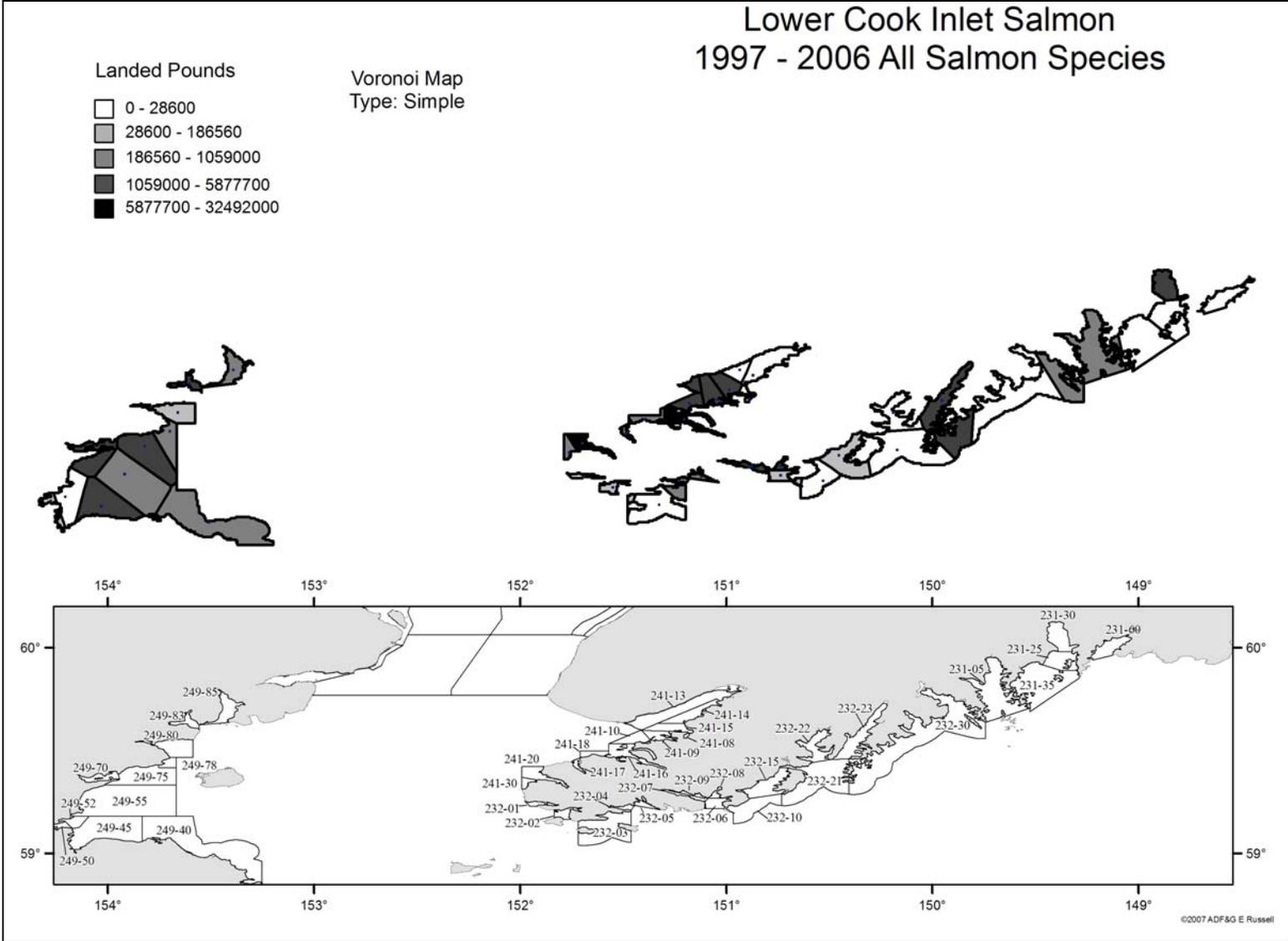


Figure 3.—Map of Lower Cook Inlet salmon.

## **FISHING SEASONS**

Fishing seasons vary in Cook Inlet. In the salmon fisheries, the drift gillnet season is open from late June through August; the set gillnet season is from June through September and the purse seine season is from June through August.

The herring fishery is usually open from mid-April through mid-May. The Lower Cook Inlet has not had a directed commercial herring opening since 1998.

The Cook Inlet commercial Pacific cod season is comprised of three to four opening periods represented by allowable gear type and management plan. The parallel season (concurrent with federal season) is from January through March and the state waters fishery is open intermittently from February through December.

## **COMMERCIAL FISHERIES IMPACT**

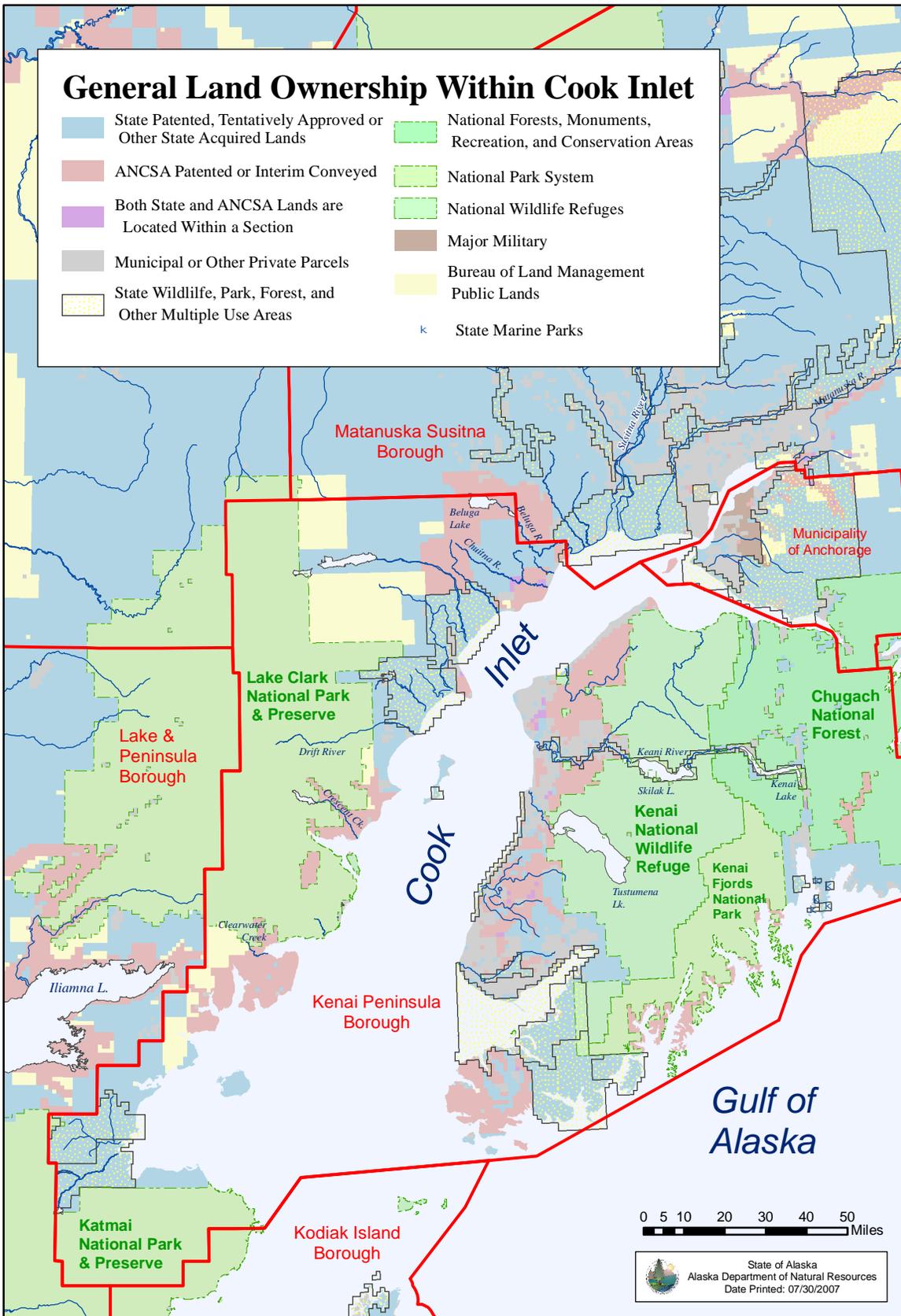
Commercial fishing processors operating in Cook Inlet reported total combined fishery purchases of \$449 million dollars between 1997 and 2006. The first wholesale value alone accounts for over \$1 billion dollars in sales between 1997 and 2005 (ADF&G COAR Database). Curtailment of commercial fishing due to adoption of a critical habitat designation may result in a depressed commercial fishing industry economy.

## **CONCLUSION**

As illustrated by the examples of various economic activities in Cook Inlet described above, it will be difficult to determine the economic impact that a listing of Cook Inlet beluga whales or any PCE or critical habitat may have. The industries and communities that engage in activities in and around Cook Inlet are just now assessing the possible ramifications of a beluga listing under ESA. We urge the Service to carefully consider the many activities in the Cook Inlet watershed and the many effective steps that have been effectively and proactively implemented to eliminate or reduce impacts on the beluga whales and their habitat when designating critical habitats and their primary constituent elements.

# General Land Ownership Within Cook Inlet

- |   |  |   |   |
|---|--|---|---|
|  | State Patented, Tentatively Approved or Other State Acquired Lands |  | National Forests, Monuments, Recreation, and Conservation Areas |
|  | ANCSA Patented or Interim Conveyed                                 |  | National Park System  |
|  | Both State and ANCSA Lands are Located Within a Section            |  | National Wildlife Refuges                                       |
|  | Municipal or Other Private Parcels                                 |  | Major Military  |
|  | State Wildlife, Park, Forest, and Other Multiple Use Areas         |  | Bureau of Land Management Public Lands                          |
|   |  |  | State Marine Parks  |



State of Alaska  
 Alaska Department of Natural Resources  
 Date Printed: 07/30/2007



**Facility Type**

- Fish
- Mine
- Oil & Gas
- WWTF

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**Wastewater Discharge Locations  
(Permitted Facilities)  
Cook Inlet & Vicinity, Alaska**

Data Source: Alaska Department of Environmental Conservation, Division of Water



DRAFT  
April 2009



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NAD83 StatePlane Alaska Zone 4 FIPS 5004 Feet