United States Environmental Protection Agency

Interested Parties Conceptual Model Bering Sea Ecosystem

Contract No. 68-C7-0011, WA # 2-180

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April 2000

Table of Contents

List of Tables

List of Figures

1. INTRODUCTION

This document presents a conceptual model of parties interested in strategies and programs for the management of resources in the Bering Sea. ICRC has prepared this document for the United States Environmental Protection Agency (EPA) through a subcontract with Science Applications International Corporation (SAIC). Preparation of this draft model was authorized under SAIC's contract with EPA (EPA Contract Number 68-C7-0011, WA # 2-180) through Purchase Order Number 4400021584 (dated January 10, 2000).

1.1 OVERVIEW OF THE BERING SEA ECOSYSTEM

The Bering Sea is a sub-arctic, northern extension of the Northern Pacific Ocean. The area occupied by the actual Bering Sea is almost a million square miles located between Alaska and Russia and bounded on the north by the Bering Straits and on the south by the arc of the Aleutian Islands. The Bering Sea is the world's third-largest semi-contained sea, and has an extensive continental shelf that underlies about one-half of its area. The Bering Sea ecosystem includes the sea proper, as well as the surrounding land masses within Alaskan and Russian watersheds that discharge to the Bering Sea. Thus, the ecosystem contains much of interior Alaska, a substantial portion of Siberian Russia and parts of northwest Canada.

The Bering Sea is a complex and unique ecosystem that attracts interest from a variety of agencies, businesses and organizations. The ecosystem contains one of the world's largest remaining fisheries, is home to number of unique species, and is the focus for such potential and actual natural resource utilization as marine mining for precious metals and petroleum exploration and development. The ecosystem also contributes resources to a culturally distinct subsistence base for a variety of indigenous peoples in Alaska and far eastern Russia.

Because the Bering Sea ecosystem is diverse and thriving, it supports a world-class fishery contributing 56 percent of the United States' fisheries production. It also supports about 5 percent of the world harvest of fish and shellfish and represents a significant economic force and food source for several nations, including Russia and Japan. The marine ecosystem supports more than 450 species of fish, crustaceans and mollusks. A variety of species of salmon, flatfish, cod, pollock, Pacific halibut, herring, sablefish and shellfish are harvested from the area.

The Bering Sea also contains the largest internationally shared marine and mammal populations, represented by more than 25 species. The largest international aggregation of seabirds in the world also utilizes the Bering Sea, including 50 species and 25 million individuals.

The resources of the Bering Sea ecosystem have been essential to the indigenous peoples of the region for centuries. Those resources continue to provide the foundation for cultural and religious traditions. These resources are of significant value to both the coastal peoples and inland communities that utilize migratory salmon or who travel to the shore to hunt whales, sea lions and walrus.

During recent years, increasing local, national and international anthropogenic impacts have created serious stresses to the sensitive Bering Sea. Those stresses have been demonstrated in species decline, increasing contamination, changes in climate, loss of habitat and impacts on native and rural Alaskan communities and others gaining their livelihood from the sea. Populations of seabirds, such as common murres, thick-billed murres, and red-legged and black-legged kittiwakes have declined by as much as 80%. Spectacle eiders declined from 50,000 pairs in 1971 to 1,700 pairs in 1992, and are now listed as threatened under the Endangered Species Act. Stellar sea lion populations have declined by more than 80% in the past thirty years, and have reached an endangered status. Fur seal populations have decreased by 50% since the 1950's. Sea otters are rapidly declining along the Aleutian chain. Fish and shellfish populations have fluctuated significantly in response to commercial fishing pressures and natural processes influencing survival.

1.2 PURPOSE OF THE BERING SEA INTERESTED PARTY CONCEPTUAL MODEL

EPA recognizes both the complex natural ecosystem and the complex interaction of human resource needs, management programs and conservation desires that impact the Bering Sea ecosystem. In response to the complex issues associated with management of the ecosystem, EPA is proposing to work in partnership with international, national, regional, and local organizations; native groups; businesses utilizing area resources and conservation groups to develop a shared vision of planning, management and utilization for the Bering Sea. This partnership will participate in conducting the problem formulation process as part of prepar-

ing an integrated response assessment for the ecosystem. Issues to be addressed during that cooperative problem formulation include:

- *chemical, physical and biological stressors;*
- *climate change;*
- *habitat alteration; and*
- *resource exploitation.*

Once completed, the problem formulation would be used to determine data needs within the international community to conduct analyses and response characterization for the final stages of the assessment process. The means to accomplish this work will include a combination of international conferences, working assessment teams, pamphlets, brochures and symposia.

The first steps in the development of an integrated assessment of the Bering Sea are the identification of interested parties and a definition of the compatible and adversarial goals and objectives between those parties. These have been accomplished in the conceptual model of interested parties presented in this document. This model was developed to accomplish the following objectives:

- *Prepare a comprehensive list of parties interested in ecosystem assessment for the Bering Sea. The list is to include the full range of interests, from resource utilization to resource conservation. The list is also to include all levels of interested parties from local entities to international organizations.*
- *Organize the identified interested parties into categories and sub-categories of common interests, goals and management objectives to allow development commonality (See Section 1.3).*
- *Identify and define the relationships between various categories and sub-categories of interested users, including both complementary and adversarial goals and objectives for ecosystem resources.*

The goal of categorizing the interested parties was to define groupings around which to organize meetings and symposia to advance common management objectives for discussion between categories.

1.3 CATEGORY DISCLAIMER

Both EPA and ICRC are aware that all parties interested in the Bering Sea ecosystem are interested and involved in multiple aspects of system management. For example, a private fishing business is interested in the long-term conservation of the fishing resource as well as the utilization of that resource for their livelihood. Thus, the categorization of interested users may be somewhat arbitrary, and does not necessarily address the true range of interests of a party. This also may be true of individuals working for interested organizations. However, for the purpose of model development, it was necessary to assign each organization to only one category. That assignment was based on the primary economic, professional or stated mission objectives of each organization according to distinct category definitions presented in Appendix A of this document. To proactively address the overlapping interest of the parties involved, the EPA will remain sensitive to the actual, broader interests of each party during then integrated assessment process.

1.4 LIVING DOCUMENT DISCLAIMER

In developing this conceptual model, it became apparent that there is a myriad of parties interested in the Bering Sea ecosystem. The Scope of Work implemented by ICRC in developing this model included incorporating entities previously identified by the EPA, by the State or Alaska and similar sources, as well as new entities identified by ICRC. However, the list of interested parties in this draft document was not expected to be exhaustive or complete. In fact, we anticipate that numerous existing and "yet-to-be-formed" groups will be added to this document through the review process and through the planning stages for meetings and symposia to be developed by the EPA. This conceptual model does provide a system of categorization in which those new entities can be readily identified and included.

2. METHODOLOGY

This section describes the general methodology used to develop the Conceptual Model.

2.1 DATA SOURCES

Potential interested parties were identified through a variety of sources. Specifically, ICRC reviewed a number of references provided by EPA for listed parties, including a list of survey forms previously solicited by the EPA. ICRC performed a number of web-based searches for potentially interested parties based on key words and Alaska environmental links.

2.2 DEVELOPMENT OF CATEGORIES

After the initial set of interested parties were compiled, ICRC reviewed the list to identify general categories of professional and economic interest. The objective was to identify between four and six major headings that cumulatively encompassed the top-level interests and objectives of all parties. From that exercise, ICRC identified the following major categories.

- *Conservors*
- *Investigators*
- *Managers/Regulators*
- *Resident Services*
- *Users*

Definitions of these categories are included in Appendix A. Interactions between these groups are shown on Figure 1.

ICRC then reviewed the potential interested parties list to identify a scheme of sub-categories that would further define the interest objectives of various users. ICRC defined a goal of establishing sub-categories that, to the degree possible, were related throughout the various main categories. Therefore, for all main categories except users, the sub-categories were location based (i.e. local, community tribal or native; state; region, national; international). For Users, the sub-categories were based upon types of businesses or groups. These sub-categories were further divided to create the following chain of sub-categories, which are also reflected graphically in Figure 2.

- *Conservors*
    - *Native Groups*
    - *State*
    - *Regional*
    - *National*
    - *Foreign*
        - *Canada*
        - *Russia*
    - *International*
- *Managers/Regulators*
    - *Native Groups*
    - *State*
    - *Regional*
    - *National*
    - *Foreign*
        - *Canada*
        - *Russia*
        - *Korea*
    - *International*
- *Users*
    - *Development/User Agencies*
        - *State*
        - *Regional*
        - *National*
        - *International*
    - *Private Businesses*
    - *Communities*
        - *Coastal*
        - *River*
        - *Interior Watershed*
        - *Non-Ecosystem*
    - *Trade Organizations*
    - *ANC Village Corporations*
    - *ANC Regional Corporations*
- *Investigators*
    - *Private/Public*
    - *State*
    - *Regional*
    - *National*
    - *Foreign*
        - *Japan*
        - *Russia*
    - *International*
- *Resident Services*
    - *Community*
    - *Native*
        - *Local Based*
        - *Outside Based*
    - *Regional*
    - *State*
    - *National*
    - *Foreign*
        - *Russia*
    - *International*

The category and subcategory assignments for each listed interested user are presented in Tables 1 and 2. Table 1 presents the data base sorted by category and subcategory. Table 2 presents the data base alphabetized by organization. The category and subcategory assignments are also presented graphically in a series of figures discussed in the following section.

In additional to professional or economic categories of interest, interested parties will have a focus, or series of foci, on different values within the complex human/natural Bering Sea ecosystem. Those foci are present across category and subcategory designations. ICRC defined four value foci with which to characterize the interested parties. That characterization is based on the significant focus or foci of an entity. However, unlike the category designation, an entity may have more than one significant focus assigned. The foci assignments for each listed interested user are presented in Tables 1 and 2. They are also presented graphically in a series of figures discussed in the following section.

3. CONCEPTUAL MODEL

The developed conceptual model for the Bering Sea Ecosystem interested parties is presented graphically in a series of figures in this document. Figure 1 presents the interactions between the top level categories of interested parties. Figure 2 presents an overview of the model, including the various categories and sub-categories. That figure also designates the set of subsequent figures that provide more detailed information for each top-level category. Those figures are discussed in the following sections.

3.1 CONSERVORS

For the purpose of this document, Conservors are defined in Appendix A to be:

> "Any individual, group or organization whose primary professional and/or economic interest in the Bering Sea is the conservation and long-term protection of the ecosystem, or specific resources within the ecosystem. The entities in this category include native, local, state, national and international organizations, and range from groups who are focused on conserving a resource for long-term human utilization to those that favor total preservation with no resource utilization. This category does ***not*** include governmental or quasi-governmental agencies or for-profit groups."

Thus, Conservors are those entities whose primary focus or interest in the Bering Sea is for resource conservation. Other entities who may have a secondary interest in resource conservation, but who have a different primary interest, such as commercial fishing firms, are not included. Information concerning Conservors interested in the Bering Sea is presented in Figures 3 through 6. Those figures present the following information:

- ***Figure 3 – Bering Sea Conservor Groups.*** *This figure lists identified Conservors groups by subcategory. The figure also identifies the value focus or foci for each listed entity.*
- ***Figure 4 – Conservor Relationships.*** *This figure defines the complementary and adversarial relationships between Conservors and entities in each of the top-level categories.*
- ***Figure 5 – Interactions of Conservor Sub-Categories – Bering Sea Ecosystem.*** *This figure presents sub-categories of the Conservor category and graphically presents the interactions among those sub-categories.*
- ***Figure 6 – Conservor Sub-Category Relationships.*** *This figure defines the complementary and adversarial relationships among the Conservor sub-categories.*

3.2 MANAGERS/REGULATORS

For the purpose of this document, Managers/Regulators are defined in Appendix A to be:

> "Any individual, group or agency whose primary professional interest in the Bering Sea is either the management of area resources, or the development and implementation of regulations to manage and protect those resources. This category includes native, local, state, federal, and international agencies including both resource management agencies, such as the National Marine Fisheries Service, and regulatory agencies such as the US Environmental Protection Agency and the Alaska Department of Environmental Conservation. This category is comprised exclusively of governmental and quasi-governmental entities."

Thus, Managers/Regulators are those entities whose primary focus or interest in the Bering Sea is the management of resources or regulation of resource use.

Information concerning Managers/Regulators interested in the Bering Sea is presented in Figures 7a through 10. Those figures present the following information:

- ***Figure 7a – Bering Sea Manager/Regulator Groups – Natural Resource Value Focus.*** *This figure lists identified Managers/Regulators by subcategory whose focus value includes Natural Resources.*
- ***Figure 7b – Bering Sea Manager/Regulator Groups – Other Value Foci.*** *This figure lists identified Managers/Regulators by subcategory whose focus values includes Cultural, Health and Economic values.*
- ***Figure 8 – Manager/Regulator Relationships.*** *This figure defines the complementary and adversarial relationships between Managers/Regulators and entities in each of the top-level categories.*
- ***Figure 9 – Interactions of Manager/Regulator Sub-Categories – Bering Sea Ecosystem.*** *This figure presents sub-categories of the Managers/Regulators category and graphically presents the interactions among those sub-categories.*
- ***Figure 10 – Manager/Regulator Sub-Category Relationships.*** *This figure defines the complementary and adversarial relationships among the Manager/Regulator sub-categories.*

3.3 USERS

For the purpose of this document, Users are defined in Appendix A to be:

> "Any individual, group of individuals, business or trade organization whose primary professional and/or economic interest in the Bering Sea is for the utilization of an area resource or resources on a *for-profi*t or *subsistence* basis. The focus of users can be either single-resource oriented (i.e. oil development) or multi-resource oriented. Users include a wide variety of entities ranging from local subsistence users to multi-national corporations, and include village and regional native corporations."

Thus, Users are those entities whose primary focus or interest in the Bering Sea is for resource utilization.

Information concerning Users interested in the Bering Sea is presented in Figures 11 through 27. Those figures present the following information:

- ***Figure 11 – Bering Sea User Groups – State, Regional, National and International Developer/User Agencies.*** *This figure lists identified Users in the Developer/User Agency sub-category. Developer/User Agencies are defined in Appendix A as "any local, regional, state or federal agency whose primary or professional interest is economic development of the Bering Sea (such as the Aleutian Pribilof Island Community Development Association or the Alaska Department of Trade and Economic Development), or who owns or uses resources within the Bering Sea ecosystem for purposes other than resource management or regulatory control (such as the US Department of Defense." The figure also identifies the value foci for each listed entity.*
- ***Figure 12 – Bering Sea User Groups – Private Businesses.*** *This figure lists identified Users that are Private Businesses. Private Businesses are defined in Appendix A as "any private business entity deriving its income, in part, for the utilization of Bering Sea resources. This subcategory does not include Trade Organizations that might represent the business, any agency or non-profit group, or ANC Village or Regional Corporations." The figure also identifies the value foci for each listed entity.*
- ***Figure 13 – Bering Sea User Groups – Coastal Villages.*** *This figure lists identified Users that are subsistence users in Coastal Villages. Coastal Villages are defined in Appendix A as "a village located on the coast of the Bering Sea, or sufficiently close to the coast to allow local residents and business to utilize the coast, or the Bering Sea directly, on a routine or near-daily basis." The figure also identifies the value foci for each listed entity.*

- ***Figure 14 – Bering Sea User Groups – River Villages.*** *This figure lists identified Users that are subsistence users in River Villages. River Villages are defined in Appendix A as "a village located along a major river that ultimately discharges into the Bering Sea, and whose residents utilize the river for transportation, business, recreational or subsistence use more frequently than they use the Bering Sea directly." The figure also identifies the value foci for each listed entity.*
- ***Figure 15 – Bering Sea User Groups – Interior Watershed Villages.*** *This figure lists identified Users that are subsistence users in Interior Watershed Villages. Interior Watershed Villages are defined in Appendix A as "a village located within a watershed that ultimately discharges into the Bering Sea, but which is neither a Coastal Village nor a River Village." The figure also identifies the value foci for each listed entity.*
- ***Figure 16 – Bering Sea User Groups – Non-Ecosystem Villages.*** *This figure lists identified Users that are subsistence users in Non-Ecosystem Villages. Non-Ecosystem Villages are defined in Appendix A as "an Alaskan village not located along the cost of, or within a watershed ultimately discharging to, the Bering Sea, but which still has an interest in the Bering Sea." The figure also identifies the value foci for each listed entity.*
- ***Figure 17 – Bering Sea User Groups – Trade Organizations.*** *This figure lists identified Users that are Trade Organizations representing commercial resource utilization interests in the Bering Sea. Trade Organizations are defined in Appendix A as "any non-government funded trade or business organization representing the organized political, economic or other interests of private users of Bering Sea resources." The figure also identifies the value foci for each listed entity.*
- ***Figure 18 – Bering Sea User Groups – ANC Village Corporations.*** *This figure lists identified Users that are ANC Village Corporations. ANC Village Corporations are defined in Appendix A as "one of the village Alaska Native Corporations created by the Alaska Native Claims Settlement Act." The figure also identifies the value foci for each listed entity.*
- ***Figure 19 – Bering Sea User Groups – ANC Regional Corporations.*** *This figure lists identified Users that are ANC Regional Corporations. ANC Regional Corporations are defined in Appendix A as "one of the thirteen regional Alaska Native Corporations created by the Alaska Native Claims Settlement Act." The figure also identifies the value foci for each listed entity.*
- ***Figure 20 – User Relationships.*** *This figure defines the complementary and adversarial relationships between Users and entities in each of the top-level categories.*
- ***Figure 21 – Interactions of User Sub-Categories – Bering Sea Ecosyste..*** *This figure presents sub-categories of the Users category and graphically presents the interactions among those sub-categories.*
- ***Figure 22 – Development/User Agencies Relationships.*** *This figure defines the complementary and adversarial relationships between Development/User Agencies and entities in each of the sub-categories of Users.*

- ***Figure 23 – Private Businesses Relationships.*** *This figure defines the complementary and adversarial relationships between Private Businesses and entities in each of the sub-categories of Users.*
- ***Figure 24 – Communities Relationships.*** *This figure defines the complementary and adversarial relationships between Communities and entities in each of the sub-categories of Users.*
- ***Figure 25 – Trade Organization Relationships.*** *This figure defines the complementary and adversarial relationships between Trade Organizations and entities in each of the sub-categories of Users.*
- ***Figure 26 – ANC Village Corporation Relationships.*** *This figure defines the complementary and adversarial relationships between ANC Village Corporations and entities in each of the sub-categories of Users.*
- ***Figure 27 – ANC Regional Corporation Relationships.*** *This figure defines the complementary and adversarial relationships between ANC Regional Corporations and entities in each of the sub-categories of Users.*

3.4 INVESTIGATORS

For the purpose of this document, Investigators are defined in Appendix A to be:

> "Any individual, group, university, governmental agency or other organization whose primary professional interest in the Bering Sea is the objective collection of scientific data and/or dissemination of scientific information. This category includes private, academic and governmental organizations that are not functioning in a political advocacy role. This category may include parts of an organization that includes Managers/Regulators in other parts, such as different divisions of the US Environmental Protection Agency. The category does ***not*** include research or informational divisions of entities included in the User or Conservor categories."

Thus, Investigators are those entities whose primary focus or interest in the Bering Sea is in collecting scientific information related to resources and resource utilization.

Information concerning Investigators interested in the Bering Sea is presented in Figures 28 through 31. Those figures present the following information:

- ***Figure 28 – Bering Sea Investigators Groups.*** *This figure lists identified Investigators groups by subcategory. It also identifies the value focus or foci for each listed entity.*
- ***Figure 29 – Investigator Relationships.*** *This figure defines the complementary and adversarial relationships between Investigators and entities in each of the top-level categories.*

- ***Figure 30 – Interactions of Investigator Sub-Categories – Bering Sea Ecosystem.*** *This figure presents sub-categories of the Investigator category and graphically presents the interactions among those sub-categories.*
- ***Figure 31 – Investigator Sub-Category Relationships.*** *This figure defines the complementary and adversarial relationships among the Investigator sub-categories.*

3.5 RESIDENT SERVICES

For the purpose of this document, entities providing Resident Services are defined in Appendix A to be:

> "Any individual, group, organization or agency whose primary professional interest in the Bering Sea is providing services for, or otherwise addressing the needs of, the indigenous population of the area. This category includes local and tribal governing bodies (such as IRA or Traditional Councils) state agencies, federal agencies (such as the Indian Health Service), international agencies and public organizations (such as Indigenous Survival International and the Inuit Circumpolar Youth Council) focused primarily on human concerns."

Thus, Resident Service providers are those entities whose primary focus or interest in the Bering Sea is in providing services to the indigenous population.

Information concerning providers of Resident Services interested in the Bering Sea is presented in Figures 32 through 38. Those figures present the following information:

- ***Figure 32 – Bering Sea Resident Services Groups - Communities.*** *This figure lists identified community governments and similar organizations providing resident services to Bering Sea peoples. The figure also identifies the value foci for each listed entity.*
- ***Figure 33 – Bering Sea Resident Services Groups – Native Groups.*** *This figure lists identified Native Groups providing resident services to Bering Sea peoples. Appendix A defines Native Groups as "any group or organization comprised mainly of, and for the benefit of, Native Americans." The figure also identifies the value foci for each listed entity.*
- ***Figure 34 – Bering Sea Resident Services Groups - Regional.*** *This figure lists identified regionally based agencies and similar groups that provide resident services to Bering Sea peoples. Appendix A defines Regional as "located and or operating primarily within the confines of a section of the State of Alaska that is larger than a community or village." The figure also identifies the value focus or foci for each listed entity.*

- ***Figure 35 – Bering Sea Resident Services Groups – State, National, Foreign and International.*** *This figure lists identified government agencies, public groups and similar organizations providing resident services to Bering Sea peoples. The figure also identifies the value focus or foci for each listed entity.*
- ***Figure 36 –Resident Services Relationships.*** *This figure defines the complementary and adversarial relationships between entities providing Resident Services and entities in each of the top-level categories.*
- ***Figure 37 – Interactions of Resident Services Sub-Categories – Bering Sea Ecosystem.*** *This figure presents sub-categories of the Resident Services category and graphically presents the interactions among those sub-categories.*
- ***Figure 38 – Investigator Sub-Category Relationships.*** *This figure defines the complementary and adversarial relationships among the Resident Services sub-categories.*

Appendix A

Definitions

Table 1

Table 2

Figures 1-38