



**SEWARD PENINSULA - NULATO HILLS - KOTZEBUE
LOWLANDS
RAPID ECOREGIONAL ASSESSMENT
FINAL MEMORANDUM I-2-C**

Prepared for:

Department of the Interior
Bureau of Land Management
Rapid Ecological Assessments

Submission Date: 27 May 2011

Submitted to:

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Contents

Executive Summary	4
Task 2 Objectives	4
Data Evaluation Results for CEs	4
Data Evaluation Results for CAs.....	5
Data Evaluation Results for Managed Lands	6
Introduction to Data Evaluation Task	7
Task 2 Objectives	7
Memo Organization	7
Data Identification, Management and Evaluation	7
Data Evaluation Results for CEs	8
CE Class I: Terrestrial Coarse Filter	8
CE Class II: Terrestrial Fine Filter	9
CE Class III: Physical Feature - Permafrost	10
CE Class IV: Aquatic Coarse Filter.....	10
CE Class V: Aquatic Fine Filter	11
Data Evaluation Results for CAs	13
CA Class I: Wildfire	13
CA Class II: Anthropogenic Activities.....	13
CA Class IIIa: Non-Native Species	14
CA Class IIIb: Nuisance Native Species and Diseases	14
CA Class IV: Climate Change.....	14
Data Evaluation Results for Managed Lands & Sites	15
Summary Data Gaps and Recommendations for CEs and CAs	16
CE Data Gaps and Recommendations	16
Terrestrial Fine Filter CEs.....	16
Aquatic Fine Filter CEs.....	16
Terrestrial Coarse Filter CEs.....	16
CA Data Gaps and Recommendations	16
Non-Native Species	16
Wildfire	17
Climate Change	17
Anthropogenic Activities	17
Nuisance Native Species And Diseases	17
References	18

Appendix I: Master Data Table for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA	21
Appendix II. Coarse-filter Conservation Elements for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA	53
Appendix III: Candidate Fine-Filter Conservation Elements for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA	54
Appendix IV: Candidate Change Agents for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA	58

Executive Summary

Rapid Ecoregional Assessments (REAs) are the first step in the Bureau's Landscape Approach. REAs are intended to synthesize existing knowledge and information applicable to all lands and waters within the ecoregion. This synthesis aims to inform subsequent decision making, implementation, and monitoring by BLM and partners within the ecoregion, and should interact with ongoing scientific research as a foundation for science-based land management. REAs are organized into a series of phases and component tasks. Phase 1 includes tasks that clarify the scope, expected data and analysis approaches to be used, and culminating in a detailed workplan for the assessment. Phase 2 completes the preparation of data, conducts agreed-upon analyses, and documents assessment results. This memorandum summarizes the work, decisions, and remaining issues to be resolved for Task 2, Phase 1 for the Seward Peninsula–Nulato Hills–Kotzebue Sound Lowlands (SNK) Ecoregion. Here we conduct the assessment of data availability and quality representing the candidate conservation elements and change agents needed to answer the management questions. This memorandum is the final version (I-2-C) which has been revised and finalized by incorporating comments provided at AMT Workshop 2 or submitted separately to BLM.

Task 2 Objectives

The objectives of Task 2 were:

1. Identify available data for the REA and obtain samples or metadata
2. Evaluate the data for utility (content, scale, completeness)
3. Evaluate the data quality (precision, consistency, documentation)
4. Make recommendations about data to be applied
5. Identify data gaps and proposed revisions to management questions, conservation elements, and change agents

Data Evaluation Results for CEs

Currently there is not a single compressive land cover map for the SNK project area that has both adequate detail and high enough accuracy for an overall assessment of ecological communities. We propose to integrate three separate land cover maps into one comprehensive map to provide the most detail and best accuracy. Succession models are only available for forested and one shrub vegetation type. We will also identify plant communities and ecosystems of conservation concern through the AKNHP database.

For vertebrate CEs we obtained a wide range of datasets. A major source of data are predicted distribution models for all terrestrial vertebrates being developed by the Alaska Gap Analysis project. They will be completed by December 2011. Currently these models will be generated using Landfire land cover data. Since this data is known to have a high degree of error, AKNHP is generating a new land cover map for the REA project area that we intend to use for refinement of habitat models. Lastly, we obtained three datasets to aid in our analyses of important/critical habitats: 1) Audubon's Important Bird Areas; 2) Fish and Wildlife Service's Critical habitat designations for Spectacled and Steller's Eiders; 3) and the MESA Project (Most Environmentally Sensitive Areas) for Alaska.

For vascular plant CEs the AKNHP's Biotics Database has georeferenced information for all rare vascular plant species. However, we have minimal information on population size, trends, or vulnerabilities.

For subsistence species, we obtained a subsistence harvest records database from communities throughout Alaska and Canada including moose, reindeer, and caribou. ISER also has general hunting/fishing and commercial harvest data for subsistence wildlife species that are conservation elements. Subsistence harvest data are incomplete and are of limited use to compare harvests among communities over time or to estimate future harvest levels. ISER is also providing community level demographic and economic data that can be used for baseline descriptions and in models. We were not able to find bear or coyote data.

We are specifically highlighting permafrost as a CE for this REA due to its importance in the ecoregion. The Geophysical Institute Permafrost Lab (GIPL) model was developed in coordination with SNAP to assess the effect of a changing climate on permafrost. The GIPL model was implemented for the entire Alaskan permafrost domain, including the REA. These data include: 1) mean annual ground temperature at the base of the active layer, 2) maximum active layer thickness, 3) warming effect of snow, 4) snow depth, 5) mean annual ground surface temperature, and 6) thermal offset (difference between soil surface temp and base of active layer).

For aquatic systems, we will use a wide variety of datasets to identify the various systems. These datasets include NHD (USGS 2006), 30m DEMs, the National Geophysical Data Center's thermal springs dataset, the USFWS National Wetlands Inventory, and NOAA's Environmental Sensitivity Index data on shoreline habitats. There are 18 fish species that comprise the aquatic fine-filter CEs. We will use three primary spatial datasets to answer the fish management questions: the ADF&G Anadromous Waters Catalog, the ADF&G Alaska Freshwater Fish Inventory Database, and the AKNHP fish species range and occurrence datasets. There are extensive data gaps due to aquatic ecological systems that lack data, conservation elements that have limited data to describe their distribution in the study area, and historical fisheries information buried in reports that may or may not be available electronically and do not include associated spatial data. We also acquired the ADF&G Fish Passage Inventory Database as a development change agent. The database includes one inventory on roads in the Nome area with 106 catalogued road crossings.

Data Evaluation Results for CAs

We evaluated data for the five Change Agent (CA) classes. For fire we used the historical data compiled by the Bureau of Land Management Alaska Fire Service. Simulation modeling efforts to project future fire regimes in Alaska include: 1) ALFRESCO and 2) LANDFIRE. ALFRESCO simulates the responses of subarctic and boreal vegetation to transient climatic changes. We are also in the process of reviewing available models from the inter-agency LANDFIRE effort. Both are limited primarily to forested vegetation types.

For anthropogenic activities, we are providing data in eight subclasses: development, recreation, forage, transportation infrastructure, energy development, military, pollutants, and water use. Adequate data exist to depict and model development. We are in the process of acquiring community water source data, pollutants data, reindeer forage, and have all existing tourism data for the region. We are also compiling and documenting information on traditional knowledge. ISER does not have data about river erosion or flooding. At this point, we are relying on reports to understand how flooding and changes in river depth affect access to villages. We are using this information in our conceptual models but do not have any data to estimate empirical models. However, we have found that the best models are fairly simple such that data requirements are manageable and the assumptions going into the model are clear and explicit.

We obtained invasive species information from the Non-indigenous Aquatic Species (NAS) Database coordinated by the U.S. Geological Survey and the AKNHP Invasive Animal Species Geodatabase. The latter houses a collection of invasive animal records for Alaska but is not comprehensive for all species or for all regions in the state. Invasive plant data is present in the AKNHP-

maintained statewide weed database (AKEPIC). These data supply location information for populations of non-native plants. Data is also present on vegetation type, disturbance type, population size, percent cover, etc.

We acquired native insects and diseases information from State and Private Forestry and USFS Forest Health Protection. These surveys are done opportunistically and are limited in both temporal and spatial extent, but represent the best spatial data to-date and include the maximum extent of recent bark beetle damage and insect defoliation. It is limited to forest, willow and alder dominated vegetation types.

For the climate change CA, we will use climate datasets downscaled by SNAP to characterize historical and projected future climate regimes within the REA. The outputs from five models have been scaled down to 2 kilometer resolution using the PRISM model which takes into account elevation, slope, and aspect. The derived projections of future climate include temperature (°C) and precipitation (mm; SWE). In addition, available data derived from temperature and precipitation includes: 1) date of thaw, 2) date of freeze up, and 3) length of growing season. These climate projections are available for the years 1980-2099.

Data Evaluation Results for Managed Lands

We have acquired reports that represent managed lands which we categorize as: I—Sites of High Biodiversity, II—Specially Designated Areas of Ecological or Cultural Value, and III—Other Managed Lands. For sites of significant biodiversity value we have identified the Audubon Important Bird Areas and The Nature Conservancy Portfolio database to identify specific places of importance for long-term conservation planning. For other managed lands we currently include state boundaries and The Nature Conservancy Protected Areas Database (PAD)

Task 2 Identify, Evaluate, and Recommend Potential Data

Introduction to Data Evaluation Task

Rapid Ecoregional Assessments (REAs) are the first step in the Bureau of Land Management's (BLM) Landscape Approach. REAs are intended to synthesize existing knowledge and information applicable to all lands and waters within the ecoregion. This synthesis aims to inform subsequent decision-making, implementation, and monitoring by BLM and partners within the ecoregion and should interact with ongoing scientific research as a foundation for science-based land management. REAs are organized into a series of phases and component tasks. Phase 1 includes tasks that clarify the scope, expected data and analyses approaches to be used, and culminates in a detailed workplan for the assessment. Phase 2 completes the preparation of data, conducts agreed-upon analyses, and documents assessment results.

This document summarizes the work to-date on Phase 1, Task 2 for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands (SNK). In consultation with BLM, we have combined Tasks 2 and 3 of Phase I and are submitting a combined memorandum, sectioned into 2 volumes: This volume is the final Task 2 Memorandum; the second volume is the initial Task 3 findings (Memo I-3-a).

This volume serves as a listing of data availability and quality as well as identifying known data gaps for the candidate conservation elements and change agents needed to answer the management questions. Four of our SNK REA team members attended the Western Alaska Science Workshop on April 26-27th in anticipation of gathering additional dataset for known data gaps. Although the meeting provided generally useful insights, we were not able to fill any data gaps as a result of the meeting.

Task 2 Objectives

The objectives of Task 2 were:

1. Identify available data for the REA and obtain samples or metadata
2. Evaluate the data for utility (content, scale, completeness)
3. Evaluate the data quality (precision, consistency, documentation)
4. Make recommendations about data to be applied
5. Identify data gaps and propose revisions to conservation elements, change agents, and management questions as necessary

Memo Organization

This memorandum summarizes our evaluation of data availability and quality to represent the conservation elements and change agents needed to answer the management questions. Additionally, data that reflect locations of managed lands, specially designated lands, and area of high significance from existing natural resource prioritization efforts (e.g., TNC portfolio sites) are also addressed. The memorandum is organized according to the objectives. Details are provided in tables in the appendices.

Data Identification, Management and Evaluation

NatureServe established a secure file transfer site for the BLM REA work which is being used for transferring data between NatureServe, NatureServe sub-contractors, and data sources. NatureServe has also created a secure collaborative workspace for the REA project team. The Data Management

component of this SharePoint site includes resources such as technical instructions and documentation, and a “Master Data List” that NatureServe is using to track work status, conduct data evaluations, and prepare materials for reporting and creating tables (Appendix I). To create the Master Data List, NatureServe initially imported to our SharePoint site the spreadsheet provided by BLM “Att6.2-DMP-DataLayers.xlsx”. NatureServe has added a number of attributes to track BLM data evaluation requirements, as well as for internal data management and tracking purposes.

To ensure standardization and high quality products for BLM, many attributes in the Master Data List were configured as ‘controlled value lists’ with a menu of values to choose from or “Yes/No” check boxes. Full documentation for the Master Data List was created with definitions for all attributes, information about which attributes are required, and when appropriate, examples for the data entry.

The Master Data List is NatureServe’s primary tool for managing information about the individual data sets as well as tracking status of the work being conducted. These include:

- information about the data set (filename, data source, citation, description, data type, scale, ISO category, currentness, data agreements, data restrictions / sensitivity, metadata)
- information about data management (filename and location where data resides on NatureServe’s servers)
- work status (person requesting the data; data acquisition status and date; who needs to assess the data set; and review status)
- how data will be used in the REA analyses (type of Conservation Element, Change Agent, or place; applicable REA(s))

The Master Data List is also NatureServe’s primary tool for conducting the Phase I, Task 2 Data Quality Evaluation. To conduct this data evaluation, NatureServe started with the materials in “Appendix 7: Data Quality Evaluation Worksheet” and enhanced these by including a *Comments* field for each of the eleven Data Quality Evaluation criteria. This *Comments* field allows the expert conducting the data review to explain the assignment of one of the following confidence ratings: Very High, High, Moderate, Low, and Unknown. NatureServe’s evaluation also includes information on the intended use of the data and the suitability for these uses. Based on the information in the data evaluation attributes, NatureServe then assigns an Overall Data Confidence Rating score, again accompanied with comments where relevant.

The data evaluation process employed by NatureServe also encompasses metadata. The metadata review includes an evaluation of whether the metadata are incomplete (missing key information), minimally complete (has abstract, purpose, currentness, scale, projection, attribute definitions, and contacts), or accepted. The metadata are reviewed to ensure that the projection / coordinates and datum (as appropriate) are provided.

Data Evaluation Results for CEs

As established in memorandum I-1-C, NatureServe is following a “coarse filter/fine filter approach” for Conservation Element (CE) identification to provide an effective focus for the assessment. Coarse and fine filter CEs (including desired CEs) identified in Task 1 are listed in Appendix II and Appendix III, respectively. The Master Data List of all CE datasets identified to-date is listed in Appendix I.

CE Class I: Terrestrial Coarse Filter

Currently there is not a single compressive land cover map for the SNK project area that has both adequate detail and high enough accuracy for an overall assessment of ecological communities. Existing land cover maps include Landfire’s Existing Vegetation Type (EVT) with high detail and low accuracy (ranging between 17-40%) and the National Land Cover Database with low detail (only 20 map classes) and moderate accuracy. In order to provide the best comprehensive land cover map we propose to

integrate three separate land cover maps into one comprehensive map to provide the most detail and best accuracy. The three main maps that will be mosaicked include: 1) The Alaska Earth Cover Initiative maps compiled by Ducks Unlimited, 2) the NPS Arctic Network Mosaic Map (Jorgenson et al. 2009), and 3) the NRCS Range Survey of the Seward Peninsula Land Cover Map (Swanson et al. 1985). We will develop two legends and maps. The first includes all of the landcover classes described in each map with some combining of similar classes. For the second map we will cross-walk the land cover classes using NatureServe's Ecological Systems described by the Alaska Natural Heritage Program (AKNHP) for the Landfire project. Further detail on methods for integration will be detailed in the Task 3 component of the combined memorandum.

A listing of known plant associations within the REA study area, along with their conservation status, will also be identified through AKNHP abstract synthesis of known plant association studies. This will help us assess the distribution and status of plant associations.

CE Class II: Terrestrial Fine Filter

The "fine-filter" includes species that, due to their conservation status and/or specificity in their habitat requirements, are likely vulnerable to being impacted or lost from the ecoregion unless resource management is directed towards their particular needs. For species to be included in this class, we proposed in Task 1, and the AMT accepted, several selection criteria (see memo I-1-c). We continue to apply these criteria in an ongoing effort to finalize our list and approaches that will be used to handle all species meeting our criteria for inclusion; that effort will be concluded during Phase I of this REA.

Efforts thus far have focused on acquiring spatial datasets to better explain the distribution of fine filter CEs, including species assemblages, birds, mammals and fishes. These locational data fall into several categories. These include element occurrence data for individual terrestrial and aquatic species from the AKNHP's Biotics database; occurrence data from the AK GAP Analysis Project that was derived from numerous sources; natural history records from the Global Biodiversity Information Facility (GBIF), and polygon range maps for each CE. More specifically, for birds we obtained large multi-species datasets such as the Breeding Bird Survey (BBS), the Lower Yukon-Kuskokwim River BBS, an inventory of montane nesting birds in western Alaska's national parks, a breeding bird inventory of Army National Guard Training Sites, a database containing seasonal occurrence records for select species that could be potential carriers of the H5N1 virus, raptor surveys conducted along the Ungalik River, waterbird surveys in the Selawik National Wildlife Refuge (NWR), and a catalog of seabird colony sites and associated population information. We also obtained survey information that targeted individual bird species (CEs), such as Yellow-billed Loons, Black Scoters, King Eiders and White-fronted Geese.

For vascular plants the AKNHP's Biotics Database has georeferenced information for all rare vascular plant species. We have integrated the majority of data from more recent collections housed at University of Alaska Museum. The vascular plant data is also available in ArcMap format. We have minimal information on population size, trends, or vulnerabilities (however, see Kelso 1996, Carlson 2006, Parker 2006, Carlson et al. 2008). Predicted habitat suitability analysis, maps, and associated data have been developed for three rare plants: *Cardamine blaisdelii*, *Primula tshuktschorum*, and *Puccinellia vahliana* (modeled only for the North Slope) (Cortés-Burns 2009, 2011). Data for three primary subsistence plants that are listed as fine filter desired botanical conservation elements have been acquired from the University of Alaska Museum's Arctos database. Hundreds of georeferenced specimens from botanical collections are present for these three species. Additionally, we have developed a spatial layer of rare lichen occurrences from AKNHP's Biotics Database.

We acquired additional datasets for mammals including the Alaska Department of Fish and Game's Fur-sealing database (furbearers), and a digitized atlas of terrestrial (Caribou, brown bear) and marine mammal (ice-associated seals) seasonal concentration sites along the Bering, Chukchi, and Beaufort Sea

coasts. For muskox we obtained data on known foraging sites and range limits. For beavers, we obtained spatial information on known caches sites in the northern part of the study area.

For subsistence species, we obtained a database that contains harvest records for subsistence species from communities throughout Alaska and Canada. We obtained both telemetry data and information from composition surveys for moose in the Selawik National Wildlife Refuge and surrounding areas. For reindeer we acquired an accurate range map, data on grazing allotments and known sites and intensities of reindeer grazing pressure. We also obtained seasonal range maps for the Western Arctic Caribou Herd (calving grounds, summer range, migratory area, winter range) as well as information on burn perimeters within each of these seasonal ranges. The Institute of Social and Economic Research (ISER) is providing general hunting/fishing and commercial harvest data for subsistence wildlife species that are conservation elements. Subsistence harvest data are incomplete and are of limited use to compare harvests among communities over time or to estimate future harvest levels. Not all communities have been surveyed, only a few communities are surveyed each year, and not all species are included in every survey. However, it is the only available data of this kind. ISER is also providing community level demographic and economic data that can be used for baseline descriptions and in models.

Although we made several inquiries, we were not able to find any datasets regarding the distribution of bears (brown and black) or coyotes in the Seward Peninsula study area beyond generalized range maps.

A major source of distribution data for species CE are predicted distribution models for all terrestrial vertebrates which are currently being developed by the Alaska Gap Analysis project (GAP). They will be completed by December 2011. Currently these models will be generated using Landfire land cover data. Since this data is known to have a high degree of error, the Alaska Natural Heritage Program is generating a new land cover map for the REA project area that we intend to use for refinement of habitat models.

Lastly, datasets obtained that will aid in the analyses of important/critical habitats or areas of high biodiversity value include: 1) The Important Bird Areas dataset for Alaska, created by Audubon Alaska; 2) Critical habitat designations from the Fish and Wildlife Service for two species, Spectacled and Steller's Eiders; 3) The MESA Project (Most Environmentally Sensitive Areas) for Alaska identifies 68 of the most environmentally sensitive areas along the Alaska coastline and includes data for 16 species associated with these sensitive habitats.

CE Class III: Physical Feature - Permafrost

For this REA, physical feature data will be collected as part of the Change Agent: Climate Change. Physical feature datasets include information on soils, precipitation, and hydrology. We are specifically highlighting permafrost as a CE for this REA due to its importance in the ecoregion. Physical feature datasets are described in the section CA Class IV: Climate Change.

CE Class IV: Aquatic Coarse Filter

There are nine aquatic ecological systems (coarse filters): headwater streams, rivers, estuaries/lagoons, lowland streams/sloughs, hot springs, and four types of lakes: large and connected, small and connected, large and isolated, and small and isolated. The lake types were changed from deep and shallow to large and small because no datasets on lake depth are available for the REA study area. The size cutoff between large and small lakes has yet to be determined, but will have an ecological basis, such as providing important fish habitat or susceptibility to drying and shrub invasion. The high resolution NHD (USGS 2006) for the Yukon and Northwest Alaska subregions (subregions 1904 and 1905) will be used to locate headwater streams, lowland streams/sloughs, rivers, and the four lake aquatic habitats using tools available in ArcGIS. Rivers and lakes are distinct feature classes within the NHD.

Attributes in the NHD flow table will be used to locate first-order headwater streams. An intersection of the lakes and rivers feature classes will be used to separate connected from disconnected lakes and selecting lakes based on their area will be used to define large from small lakes. A 30m DEM will be used to create a slope grid and lowland streams/sloughs will be selected from the rivers feature class that have slopes below a specified cutoff (~2%). The DEM can also be used to identify higher order streams if the definition of headwaters is expanded to include 2nd or 3rd order streams. Hotspring locations will be based on the National Geophysical Data Center's thermal springs dataset for the United States. Estuary/lagoon locations will be based on USFWS National Wetlands Inventory (NWI) locations for estuarine and marine wetlands. Where the NWI data is not available along the northern coastline of the Seward Peninsula and the eastern coastline of Norton Sound, NOAA's Environmental Sensitivity Index data on shoreline habitats will be related to the NWI and used to identify estuaries.

CE Class V: Aquatic Fine Filter

There are 18 fish species that comprise the aquatic fine-filter CEs (Table 1). They include all five species of pacific salmon, Dolly Varden, pike, sheefish, arctic grayling, arctic char, rainbow smelt, Bering cisco, round whitefish, humpback whitefish, broad whitefish, Pacific lamprey, arctic lamprey, and Alaska blackfish. Lake trout were removed from the list of conservation elements because they do not occur in the study area (pers. comm. Brandon Scanlon and John Burr at ADF&G). Three spatial datasets will be used for answering the management questions that address fish distribution: the Alaska Department of Fish and Game (ADF&G) Anadromous Waters Catalog (AWC), the ADF&G Alaska Freshwater Fish Inventory Database (AFFID), and the Alaska Natural Heritage Program (AKNHP) 2006 fish species range and occurrence datasets. The AWC has detailed information on species and life stages in each of the catalogued streams that will be useful for identifying important spawning and rearing habitats. The AFFID includes species occurrence and stream habitat data from three ADF&G projects in the study area. Both the AWC and the AFFID are limited in that many small streams have not been inventoried for fish, or only anadromous species were targeted. The AKNHP completed a study in 2006 that included occurrence and distribution information for four of the fish conservation elements: Alaska blackfish, Bering cisco, broad whitefish, and Pacific lamprey. This project included digitizing occurrences and distribution from the known body of research for each species into spatial datasets. It should be considered a relatively complete dataset of existing information for these species as it includes a much longer historical record and non-spatial data as compared to the ADF&G databases.

There are extensive data gaps due to aquatic ecological systems that lack data, conservation elements that have limited data to describe their distribution in the study area, and historical fisheries information buried in reports that may or may not be available electronically and do not include associated spatial data. Ecological systems that have received little attention in the study area include headwater streams and lakes. Except for one ADF&G project that focused on headwater streams on the Seward Peninsula, very little research has been performed in these ecological systems. There are very few large lakes in the study area, excluding Inland Lake on the Selawik River and Imuruk Lake. There are abundant small lakes with fish data gaps located along large slow-moving rivers, such as the Selawik, Huslia, and Pilgrim Rivers; the northern portion of the Seward Peninsula; and the Yukon Delta.

From the existing spatial datasets, there is good distribution information across the REA study area for chinook salmon, chum salmon, pink salmon, sockeye salmon, and sheefish (Table 1). Species occurrence data combined with stream habitat and spatial data will be used to build habitat distribution models for Dolly Varden, arctic grayling, coho salmon, and Alaska blackfish. These distribution models will be especially helpful for extrapolating point locations to reach habitats for resident fish. The distribution model for coho salmon will help locate rearing habitat in low order streams that have not been sampled extensively across the study area. Arctic char is a local species that only occurs in lakes of the Kiglaik mountains.

There are eight CEs that lack spatial distribution data or occurrence data that could be used to model their distribution. These include both species of lamprey, all three species of whitefish, Bering cisco, rainbow smelt, and pike. For the lamprey and whitefish, many of the identifications in the existing spatial datasets were not to species. The distributions for these fish will be considered data gaps and not used in management questions that include intersecting change agents with fish distributions.

Another ADF&G dataset, the Fish Passage Inventory Database (FPID), has also been acquired as a development change agent. The database includes one inventory on roads in the Nome area with 106 catalogued road crossings. Of these, 76 crossings were rated red indicating no passage is possible for the model fish used in the assessment, a 55 mm coho salmon.

Table 1. Aquatic fine-filter CE rankings and data availability

Conservation Element	AFFID Occurrences	AKNHP Occurrences	Distribution in AWC	Data Gap
Arctic lamprey (<i>Lampetra japonica</i>)	5 (not to species)	NA	No streams in study area	Yes
Pacific lamprey (<i>Lampetra tridentata</i>)	5 (not to species)	1	No streams in study area	Yes
Broad whitefish (<i>Coregonus nasus</i>)	2	34	1 stream in study area	Yes
Humpback whitefish (<i>Coregonus pidschian</i>)	6	NA	1 stream in study area	Good for whitefish at genus level
Round whitefish (<i>Prosopium cylindraceum</i>)	11	NA	NA	
Bering cisco (<i>Coregonus laurettae</i>)	0	9	1 stream in study area	Yes
Rainbow smelt (<i>Osmerus mordax</i>)	0	NA	No streams in study area	Yes
Pike (<i>Esox lucius</i>)	5	NA	NA	Yes
Alaska Blackfish (<i>Dallia pectoralis</i>)	16	11	NA	No
Arctic char (<i>Salvelinus alpinus</i>)	0	NA	NA	No
Arctic grayling (<i>Thymallus Arcticus</i>)	88	NA	NA	No
Pink salmon (<i>Oncorhynchus gorbuscha</i>)	29	NA	Good	No
Chum salmon (<i>Oncorhynchus keta</i>)	20	NA	Good	No
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	12	NA	Good	No
Coho salmon (<i>Oncorhynchus kisutch</i>)	50	NA	Good	No
Sockeye salmon (<i>Oncorhynchus nerka</i>)	8	NA	Good	No
Dolly Varden (<i>Salvelinus malma</i>)	145	NA	Good	No
Sheefish (<i>Stendous leucichthys</i>)	0	NA	Good	No

Data Evaluation Results for CAs

We evaluated data to represent the five Change Agent (CA) classes: I – Wildfire, II – Anthropogenic Activities, IIIa – Non-Native Species, IIIb Nuisance Native Species and Diseases, and IV—Climate Change. A current draft of CAs can be found in Appendix IV.

CA Class I: Wildfire

We identified both historical and projected fire regime spatial data sets for use in the REA. Historical data compiled by the Bureau of Land Management Alaska Fire Service is available via the Interagency Alaska Coordination Center. These data include: 1) historical fire perimeters from 1950-2000 and 2) historical lightning strikes for 1986, 1988 and 1990-2010.

Simulation modeling efforts to project future fire regimes in Alaska include: 1) ALFRESCO and 2) LANDFIRE. ALFRESCO simulates the responses of subarctic and boreal vegetation to transient climatic changes. The model assumptions reflect the hypothesis that fire regime and climate are the primary drivers of landscape-level changes in the distribution of vegetation in the circumpolar north. Furthermore, it assumes that vegetation composition and continuity serve as a major determinant of large, landscape-level fires. ALFRESCO operates on an annual time step using 1 x 1 km pixels. The model simulates four major subarctic/boreal ecosystem types: upland tundra, black spruce forest, white spruce forest, and deciduous forest. These ecosystem types represent a generalized classification of the complex vegetation mosaic characteristic of the circumpolar arctic and boreal zones of Alaska. Scenarios Network for Alaska & Arctic Planning (SNAP) climate data is used as ALFRESCO inputs, thus creating projections of the impacts of changing climate on fire regime.

We are also in the process of reviewing available models from the inter-agency LANDFIRE effort. LANDFIRE is used in the US, mainly outside of Alaska, to characterize fire regimes for predominant vegetation, and then evaluate mapped outputs to determine their suitability for characterizing current and expected future conditions.

CA Class II: Anthropogenic Activities

We are providing data in eight subclasses of Class 2 Change Agents – Anthropogenic activities: development, recreation, forage, transportation infrastructure, energy development, military, pollutants, and water use. Adequate quantitative data exist to depict and model development. We have compiled community infrastructure data from state and federal sources and have historic and current demographic data. The Institute of Social and Economic Research (ISER) maintains an extensive energy database that contains data about extractive and alternative energy projects, as well as fuel prices. The military has little current activity in the area but at different periods in the past it has had a large presence. We see military impact as effects from abandoned past sites and clean up efforts. We are in the process of acquiring data about those sites from the Army Corp of Engineers. There are few roads in the area; the primary transportation infrastructure is ports and airports. We have port and airport data and will include information about proposed projects (such as the road to Nome). We are in the process of acquiring community water source, water use, and water quality data from the state. We have all existing tourism data for the region but it is limited because recreational activity in the area is very minimal. We expect to receive data on reindeer forage. Finding and acquiring data on pollutants is still in process; ISER may acquire data to be able to map the level and possibly the type of contamination, across some areas of the ecoregion.

We are also compiling and documenting information for CEs and CAs that is not contained in standard dataset format. Examples are traditional knowledge, conflicts between general hunters and subsistence hunters, detailed information about community relocation plans (Shishmaref and Kivalina), and proposed projects such as the road to Nome.

Many of these datasets are coded by community name, borough or census area, and US census bureau placefips codes and need to be linked to geographic data. We would like additional socio-economic data about household government transfers (SNAP (food stamps), and similar programs) and will contact the state. At this point, ISER does not have data about rivers, erosion, river depth, and flooding. At this point, we are relying on reports to understand how flooding and changes in river depth affect access to villages. We are using this information in our conceptual models but do not have any data to estimate empirical models.

There are few socio-economic models that are appropriate for use in areas with small populations. We have found in past research that the best models are fairly simple such that data requirements are manageable and the assumptions going into the model are clear and explicit.

CA Class IIIa: Non-Native Species

We obtained invasive species information from the Nonindigenous Aquatic Species (NAS) Database coordinated by the U.S. Geological Survey and the AKNHP Invasive Animal Species Geodatabase. The latter houses a collection of invasive animal records for Alaska but is not comprehensive for all species or for all regions in the state. At this time we are not aware of any studies that have been done on aquatic invasives in the Seward Peninsula study area. There is only one known invasive aquatic species that may have connectivity to the study area: *Elodea canadensis*, which was collected from Chena Slough in Fairbanks.

Invasive plant data is present in the AKNHP-maintained statewide weed database (AKEPIC). We have roughly 100,000 georeferenced data points for 200 species of non-native plants in the state including 279 locations of weed species within the REA boundary. These data supply location information for populations of non-native plants. Data is also present on vegetation type, disturbance type, population size, percent cover, etc.

CA Class IIIb: Nuisance Native Species and Diseases

We acquired native insects and diseases information from State and Private Forestry and USFS Forest Health Protection. Forest health aerial surveys are conducted annually, primarily in July-August, and contain over two decades of data. These surveys are done opportunistically and are limited in both temporal and spatial extent. Additionally, pest symptoms often show delayed responses so actual timing of insect infestations for current years might not be expressed during the aerial survey. These data represent the best spatial data to-date and include the maximum extent of recent bark beetle damage and insect defoliation.

Didymosphenia geminata has been identified from a few locations in the state but is currently not known to occur in the study area. At this point, we have not been able to acquire any additional beaver data to investigate expanding beaver populations.

CA Class IV: Climate Change

We will use climate datasets downscaled by SNAP to characterize historical and projected future climate regimes within the ecoregion. We will devote substantial effort to describing how the data will be applied for Task 3, however. Historical climate is derived from the Climate Research Unit (CRU) data and include years 1901-2009 for temperature (°C) and 1901-2006 for precipitation (mm; Snow Water Equivalent or SWE). Projections of future climate are based on outputs from the five Intergovernmental

Panel on Climate Change (IPCC) Global Circulation Models (GCMs) that perform the best in Alaska (ECHAM5, GFDL21, MIROC, HAD, CCCMA) and the five model average for all three emission scenarios (Walsh et al. 2008). The three emission scenarios (A2, A1B and B2) refer to the IPCC emission scenarios used in the models, where A1B is the midrange scenario, A2 is more pessimistic (higher emissions) and B1 is more optimistic (lower emissions). The outputs from these five models have been scaled down to 2 kilometer resolution using the PRISM model which takes into account elevation, slope, and aspect. The derived projections of future climate include temperature (°C) and precipitation (mm; SWE). In addition, available data derived from temperature and precipitation includes: 1) date of thaw, 2) date of freeze up, and 3) length of growing season. Date of thaw and date of freeze were derived by creating a running average of mean monthly values and interpolating on what ordinal day these values crossed the freezing point. Length of growing season is the number of days between these two derived dates. These climate projections are available for the years 1980-2099. The most commonly used outputs are decadal mean and standard deviation (by year and month) and will likely be the most appropriate for use in the REA as well.

To assess possible changes in the permafrost thermal state and the active layer thickness (CE Class III), SNAP collaborated with the Geophysical Institute Permafrost Lab (GIPL) at the University of Alaska Fairbanks to develop the GIPL model. The GIPL model was implemented for the entire Alaskan permafrost domain, including the REA. Input parameters to the model are spatial datasets (2 x 2 km spatial resolution) of mean monthly air temperature and precipitation, prescribed vegetation, soil thermal properties, and water content, which are specific for each vegetation and soil class and geographical location. The SNAP data set, as described previously, was used to model climate forcing. Each derived value represents a single month within a given year based on the composite (mean) output of the five models using the A1B emission scenario. These data include: 1) mean annual ground temperature at the base of the active layer, 2) maximum active layer thickness, 2) warming effect of snow, 3) snow depth, 4) mean annual ground surface temperature, and 5) thermal offset (difference between soil surface temp and base of active layer).

Data Evaluation Results for Managed Lands & Sites

We have acquired reports that represent managed lands which we categorize as: I—Sites of High Biodiversity, II—Specially Designated Areas of Ecological or Cultural Value, and III—Other Managed Lands. For sites of significant biodiversity value we have identified the Audubon Important Bird Areas and The Nature Conservancy Portfolio database to identify specific places of importance for long-term conservation planning. For other managed lands we currently include state boundaries and The Nature Conservancy Protected Areas Database (PAD).

Summary Data Gaps and Recommendations for CEs and CAs

We summarize the key data gaps and revisions by REA component:

CE Data Gaps and Recommendations

Terrestrial Fine Filter CEs

Although we made several inquiries, we were not able to find any species specific datasets regarding the distribution of bears (brown and black) or coyotes in the Seward Peninsula study area beyond generalized range maps.

Our knowledge of rare plant location, ecology, and population trends is largely incomplete. Survey effort is poor outside of the southern Seward Peninsula and Baldwin Peninsula, particularly in the eastern and southern portions of the REA. Additional populations of rare plants would likely be found with future surveys. We have discovered very little data on population size or trends for rare plants. The greatest amount of information on population trends are for a population of *Gentianopsis detonsa* at Sheshalik, where local resident Bob Uhl has been observing the population for over 30 years (see Parker 2006). His studies or data do not appear to be published or otherwise available.

Aquatic Fine Filter CEs

There are eight fine-filter CEs that lack spatial distribution data or occurrence data that could be used to model their distribution. These include both species of lamprey, all three species of whitefish, Bering cisco, rainbow smelt, and pike.

Terrestrial Coarse Filter CEs

There is not an existing landcover map with high enough accuracy or detail for the REA area. We are currently in the process of mosaicing existing landcover maps and developing a standard hierarchical vegetation classification for the region based on the mosaicked maps. This mosaiked map will result in an adequate map for the survey area. There are limitations in the landcover map such as not being able to distinguish black spruce from white spruce. We could use ground/aerial plots to model their distribution in combination with Digital Elevation Models (DEMs). There is also a black spruce and white spruce model that SNAP developed for their ALFRESCO models that might translate to the new mosaiced landcover map. We are also limited on ground plot data for the south-half of the REA. Aerial plot information is available for most of the REA. We need ground plot data for modeling landcover and species distribution. Within the LANDFIRE Reference Vegetation Database, many of the ground plots and aerial polygons were incorrectly labeled to a map class for mapping and modeling purposes. We recommend reviewing and correctly labeling all ground plot and aerial polygons in the REA. The plant association descriptions and their associated rarity ranks are not available for most of the REA.

CA Data Gaps and Recommendations

Non-Native Species

We were unable to find any spatial information indicating the presence of any terrestrial animal invaders within or adjacent to the study area.

Survey effort for non-native species is weak throughout the REA. Limited surveys have occurred on National Park Service lands, the Iditarod Trail, Unalakleet River, and many villages and towns. Overall

survey effort is biased towards anthropogenically disturbed areas. Additionally, impacts of non-native plants to the regional ecology or individual species of conservation concern are not known.

There are no known occurrences of aquatic invasive species in the study area and there is also limited information specific to Alaska describing vectors for their transmission, potential effects on native aquatic resources, and predictions of future distributions. Due to this lack of data, a literature search on aquatic invasive species will be used to answer management questions specific to invasive species.

Wildfire

While historical and projected fire regime spatial data sets for the REA are both available, the modeled potential future successional dynamics are limited to four vegetation classes including: black spruce forest, white spruce forest, deciduous forest and tundra. These vegetation classes represent the complex vegetation mosaic occupying the circumpolar arctic and boreal regions, yet it does not account for the substantial variation in species composition within these and other intermediate vegetation types. For the REA, this is a substantial data gap as differences among tundra vegetation types are ignored and lumped as a single tundra class.

Climate Change

The derived projections of future precipitation are limited to snow water equivalent (mm; SWE). Therefore, at this time, SNAP cannot easily distinguish between snow and rain in the winter months. We can make crude estimates based on temperature, but since our data are monthly means we cannot determine whether precipitation on a particular day fell as snow or rain. To do so, would require daily estimates of mean temperature. For this reason, rain-on-snow events are not predictable with current climate models.

Anthropogenic Activities

Except for population counts by age-race-sex, socio-economic data for the region are incomplete. The US Census 2010 will provide accurate population counts, but no detailed information about households. The Census Bureau has replaced the long form survey (which asks about household composition, employment, migration, expenses, and income) with the American Community Survey (ACS). The rural Alaska sample for the ACS is very small and yields estimates with such high standard errors that the estimates are not useful.

Subsistence harvest data come from ADFG. Subsistence surveys conducted in a small number of communities each year, and the group of communities surveyed varies from year to year. Some communities have never been surveyed. Others have not been surveyed in 25 years. Not all species are included in all surveys. For example, some of the survey data contains only bird harvests.

Subsistence use areas and hunter access. Detailed information about hunter access to animals, including seasonal use of rivers and trails, changes in patterns with weather conditions, and different access for different species is not available for this region.

Nuisance Native Species And Diseases

Aerial surveys of nuisance native species and disease agents are only available for a portion of the REA area from 1989-2010. These data are subjective and limited by observer bias. Disease agents and defoliator damage may not have been visible at the time of the aerial survey. Also data quality can be compromised by limitations in visibility from the aircraft due to a variety of events including fires, flooding, cloud cover, and snow cover. Disease agents and defoliators are identified for only some species with different severity indices depending on the species or grouping of species.

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Appendices

Appendix I: Master Data Table for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class I Wildfire	LANDFIRE Fire Behavior Models	13 Anderson (1982) Fire Behavior Fuel models; 40 Scott and Burgan (2005) Fire Behavior Models http://www.landfire.gov/products_national.php	obtained	SNAP	Raster		
CA Class I Wildfire	LANDFIRE FRCC Departure Index	The Fire Regime Condition Class (FRCC) Departure Index data product uses a range from 0 to 100 to depict the amount that current vegetation has departed from simulated historical vegetation reference conditions.	obtained	SNAP	Raster	Fire regime condition class (FRCC) is a discrete metric that quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions	Error level too high to use.
CA Class I Wildfire	LANDFIRE Mean Fire Return Interval	The Mean Fire Return Interval layer quantifies the average period between fires under the presumed historical fire regime. This frequency is derived from vegetation and disturbance dynamics simulations using LANDSUM (Keane and others 2002, Hann and others 2004).	obtained	SNAP	Raster		
CA Class I Wildfire	LANDFIRE Percent of Low-severity Fire	The Percent of Low-severity Fire layer quantifies the amount of low-severity fires relative to mixed- and replacement-severity fires under the presumed historical fire regime.	obtained	SNAP	Raster	These data will be used to inform the fire frequencies and extent parameters in the quantitative terrestrial (VDDT) models.	These data are suitable, in association with other data, for their intended purpose. The data are, by and large, not suitable in isolation.
CA Class I Wildfire	LANDFIRE Percent of Mixed-severity Fire	The Percent of Mixed-severity Fire layer quantifies the amount of mixed-severity fires relative to low- and replacement-severity fires under the presumed historical fire regime.	obtained	SNAP	Raster	These data will be used to inform the fire frequencies and extent parameters in the quantitative terrestrial (VDDT) models.	These data are suitable, in association with other data, for their intended purpose. The data are, by and large, not suitable in isolation.
CA Class I Wildfire	LANDFIRE Percent of Replacement-severity Fire	The Percent of Replacement-severity Fire layer quantifies the amount of replacement-severity fires relative to low- and mixed-severity fires under the presumed historical fire regime.	obtained	SNAP	Raster	These data will be used to inform the fire frequencies and extent parameters in the quantitative terrestrial (VDDT) models.	These data are suitable, in association with other data, for their intended purpose. The data are, by and large, not suitable in isolation.

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class I Wildfire	LANDFIRE Environmental Site Potential (ESP)	The LANDFIRE Environmental Site Potential (ESP) layer represents the vegetation that could be supported at a given site based on the biophysical environment, regardless of natural disturbance regime.	available online	SNAP	Raster	Give suitability of BpS maps for related purpose, this map will not be needed.	
CA Class I Wildfire	LANDFIRE Existing Vegetation Height (EVH)	Vegetation height represents the average height of the dominant vegetation for a 30-m grid cell.	obtained	SNAP	Raster		
CA Class I Wildfire	LANDFIRE Existing Vegetation Cover (EVC)	Vegetation cover represents the average percent cover of existing vegetation for a 30-m grid cell.	obtained	SNAP		These data provide seamless coverage of vegetation coverage by class.	NatureServe has more recent and more relevant data on vegetation coverage. Those will be used for spatial modelling / assessments.
CA Class I Wildfire	LANDFIRE Fire Regime Condition Class (FRCC)	Fire regime condition class (FRCC) is a discrete metric that quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions	obtained	SNAP	Raster		
CA Class I Wildfire	LANDFIRE Vegetation Dynamics Models	These are VDDT models for all terrestrial systems as BpS units with some natural fire regime.	available online	SNAP	database of model parameters	These models, and their supporting data, are intended to provide foundational information for the quantitative terrestrial models produced for the CBR and MBR ecoregions.	These models, and their supporting data, are suitable for foundational information. The models were created to study historic vegetation patterns and dynamics. As a result, they do not include unique anthropogenic ecological states, and thus are not suitable for inclusion into the model library without review and revision.

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class I Wildfire	SNAP's ALFRESCO fire regime model: projections of ecosystem change	Model projections of ecosystem change (ecosystem type & stand age) derived from the 5 IPCC models (CGCM3.1,ECHAM5,GFDL21,HADLEY and MIROC) that rank best in accuracy in Alaska and the far north. Historical outputs are available for for the period 1860-2007 and projected outputs are available for the period 2007-2099. Data are summarized as decadal outputs. Boreal ALFRESCO simulates the responses of subarctic and boreal vegetation to transient climatic changes. The model assumptions reflect the hypothesis that fire regime and climate are the primary drivers of landscape-level changes in the distribution of vegetation in the circumpolar arctic/boreal zone. Furthermore, it assumes that vegetation composition and continuity serve as a major determinant of large, landscape-level fires. Boreal ALFRESCO operates on an annual time step, in a landscape composed of 1 x 1 km pixels, a scale appropriate for interfacing with mesoscale climate and carbon models. The model simulates five major subarctic/boreal ecosystem types: upland tundra, black spruce forest, white spruce forest, deciduous forest, and grassland-steppe. These ecosystem types represent a generalized classification of the complex vegetation mosaic characteristic of the circumpolar arctic and boreal zones of Alaska. SNAP climate data is used as ALFRESCO inputs, thus creating projections of the impacts of changing climate on fire regime.	obtained	SNAP	Ascii text files		
CA Class I Wildfire	SNAP's ALFRESCO fire regime model: projections of fire severity	Model projections of fire severity (# fires, area burned and fire size) derived from 2 IPCC models (CCMA & ECHAM5) for the period 2007-2099. Data are summarized as decadal outputs. Boreal ALFRESCO simulates the responses of subarctic and boreal vegetation to transient climatic changes. The model assumptions reflect the hypothesis that fire regime and climate are the primary drivers of landscape-level changes in the distribution of vegetation in the circumpolar arctic/boreal zone. Furthermore, it assumes that vegetation composition and continuity serve as a major determinant of large, landscape-level fires. Boreal ALFRESCO operates on an annual time step, in a landscape composed of 1 x 1 km pixels, a scale appropriate for interfacing with mesoscale climate and carbon models. The model simulates five major subarctic/boreal ecosystem types: upland tundra, black spruce forest, white spruce forest, deciduous forest, and grassland-steppe. These ecosystem types represent a generalized classification of the complex vegetation mosaic characteristic of the circumpolar arctic and boreal zones of Alaska. SNAP climate data is used as ALFRESCO inputs, thus creating projections of the impacts of changing climate on fire regime.	obtained	SNAP	Geotiff		
CA Class I Wildfire	AFS's Historical Lightning Data 1986, 1988 & 1990-2010	The Bureau of Land Management Alaska Fire Service's (AFS) operates an automated network of cloud-to-ground lightning sensors. The network consists of nine stations in Alaska and three in Yukon Territory. Sensors in the vicinity of the REA include: Unalakleet, Galena and Bethel. Historical Lightning data from 1986, 1988 and 1990 to the end of 2010 is available via the Alaska Interagency Coordination Center. The data is available as a prebuilt compressed shape file and as a compressed File Geodatabase. This includes strikes in Canada. Lightning data is stored and extracted in North American Datum 1983 decimal degrees(NAD 83).	available online	SNAP	Point		
CA Class I Wildfire	AFS's Historical Fire Perimeter Data 1950-2010	The Bureau of Land Management Alaska Fire Service (AFS)'s Historical Fire Perimeter data is available for Alaska from 1950-2010 via the Alaska Interagency Coordination Center.	available online	SNAP	Polygon		

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	AM (zip) (07-31-2009)	Extract of AM Radio Station Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	Antenna Structure Registration (ASR) (zip) (07-26-2009)	Extract of FCC Antenna Structure Registration database.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	Cellular (zip) (07-26-2009)	Extract of Cellular Radiotelephone Service sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	FM (zip) (07-31-2009)	Extract of FM Radio Station Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	Land Mobile - Broadcast (zip) (07-26-2009)	Extract of Land Mobile Broadcast Service Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	Land Mobile - Commercial (zip) (07-26-2009)	Extract of Land Mobile Commercial Service Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	Land Mobile - Private (zip) (07-26-2009)	Extract of Land Mobile Private Service Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	Market significant transmission lines in North America.	The Transmission Lines layer is a comprehensive layer consisting of market significant transmission lines in North America. Depicted lines are generally greater than 115 kV and tie major power plants to the electrical grid. Transmission lines are located	obtained	Varley	Line	This layer is intended to represent market significant electricity transmission lines.	This layer is suitable for use however additional transmission line data is being sought.
CA Class II Anthropogenic Activities	Microwave (zip) (07-26-2009)	Extract of Microwave Service sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	Paging (zip) (07-26-2009)	Extract of Paging Service Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	TIGER 2009 "edges" and roads	Comprehensive road layer for the ecoregion	requested	Theobald		TIGER line files and edges is used to represent linear development features such as roads. This layer may be used in BLM Linear Disturbance or USGS 1:24,000 DLG data is unavailable.	Generally not suitable but may be used as a backup.

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	TV - Digital (zip) (07-31-2009)	Extract of NTSC Television Station Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	TV - NTSC (zip) (07-31-2009)	Extract of Digital Television Station Transmitter sites.	obtained	Varley	Point	May be used in conjunction with BLM Linear Features maps, energy transmission and others to represent disturbance features on the landscape.	This data set requires metadata to be thematically and technically suitable for the intended use.
CA Class II Anthropogenic Activities	American Community Survey	Demographic and Socio-economic data. Community level. 5 year combined (2004-2009).	available online	Stephanie Martin	Table		
CA Class II Anthropogenic Activities	Community Population Estimates - AKDoLWD	Community level demographic data (population)	obtained	Stephanie Martin	excel/spss		
CA Class II Anthropogenic Activities	ADFG General Hunting Harvest	General hunting harvest data by species 1976-2009, harvest date (dmy), Game Management Sub-unit	available online	Stephanie Martin	Table		
CA Class II Anthropogenic Activities	Commercial Fisheries Permit Holders	Permits by residency of permit holder, fishery.	available online	Stephanie Martin	Table		

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	ADF&G Fish Passage Inventory Database	<p>Population growth and related development in Alaska has increased noticeably in the past 20 years. The Alaska Department of Fish & Game (ADF&G) strongly supports efforts to improve and maintain passage for fish and other aquatic organisms.</p> <p>The department has committed extensive resources to inventory and assess fish passage associated with road culverts over the last six years in southcentral Alaska.</p> <p>The Fish Passage Inventory Database and its associated GIS currently contains approximately 900 stream crossings located predominantly in southcentral Alaska and small portions of interior Alaska. Based upon previous fish passage inventories, it is believed that this number represents less than 20% of the total number of culverts statewide in fish-bearing waters. It is estimated that at least an additional 5,000 or more anadromous and resident fish stream crossings have not yet been identified.</p> <p>The FPID provides mapped information and field data collected by ADF&G staff describing fish passage in a format for use by local, municipal, state, and federal transportation managers, local watershed groups, non-governmental organizations, and the general public. The Database and GIS are important because they identify specific road-stream crossings that involve water bodies that are important to anadromous and resident fish species and therefore are afforded protection under AS 41.14.840.</p> <p>If you would like more information concerning the Fish Passage Inventory Database and GIS, or have questions about the database contents, please contact Gillian O'Doherty, Habitat Biologist, Alaska Department of Fish and Game.</p>	obtained	Dan Bogan	Point	This data set will be used to identify fish passage issues on roads in the Nome area, which is the only part of the project area that has been inventoried for this dataset.	high
CA Class II Anthropogenic Activities	Alaska Energy Statistics	Compilation of energy use by place in Alaska compiled from the U.S. Department of Energy, Energy Information Administration. Where data are missing in the EIA database, Alaska Energy Authority and Power Cost Equalization data are added.	obtained	Ginny Fay	Table		
CA Class II Anthropogenic Activities	Alaska Renewable Energy Projects		obtained	Ginny Fay	Table		
CA Class II Anthropogenic Activities	Alaska Observing Network Tourism data	This is a dataset that was developed for observing change in the circumpolar north with tourism one change agent. The data primarily consists of tourism related employment (monthly) and visitor counts (annual) for the NW Arctic, North Slope, Nome, and Sitka boroughs/Census areas.	obtained	Ginny Fay	Table		
CA Class II Anthropogenic Activities	Alaska community fuel prices	Fuel prices at the community level from surveys conducted by the Alaska Housing Finance Corporation, the Alaska Division of Community Affairs, and the UAF Cooperative Extension Service.	obtained	Ginny Fay	Table		

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	Alaska Power Cost Equalization	Data by community and utility from the Power Cost Equalization program. The most useful data are cost of fuel, average residential kilowatt hours used per month, and kilowatt hour electric rates.	obtained	Ginny Fay	Table		
CA Class II Anthropogenic Activities	Alaska Broad Band proposed infrastructure	Map data of planned towers and broadband infrastructure delivery systems.	obtained	Stephanie Martin	Unknown		
CA Class II Anthropogenic Activities	Army Corp of Engineers Hazardous Sites	Map data for Northwest Alaska of Formerly Used Defense Sites (FUDS)	requested				
CA Class II Anthropogenic Activities	Alaska Community Infrastructure database	Community level public infrastructure (roads, schools, airports, public buildings, railroads) with 2005 estimated replacement cost	obtained	Stephanie Martin	Table		
CA Class II Anthropogenic Activities	Seward Peninsula Reindeer Grazing area	Map from radio collar data of Seward reindeer herds, and BIA grazing allocations.	requested	Stephanie Martin	Unknown		
CA Class II Anthropogenic Activities	Alaska Department of Environmental Conservation	Inventory of water bodies by location and use, with information about impaired status.	need to request		Unknown		
CA Class II Anthropogenic Activities	Survey of Living Conditions in the Arctic	Surveys of 663 Inupiat households in 2003, conducted by Institute of Social and Economic Research	obtained	Stephanie Martin	Table		
CA Class II Anthropogenic Activities	TIGER geo files	US Census bureau map files with communities, Native Claims settlement areas, borough boundaries.	available online	Stephanie Martin			

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	Bering-Norton Socioeconomic Baseline 1980 MMS OCS 54-1	Data collected in response to OCS Tentative Sale #57, proposed petroleum development in the 1980s. The coastal and insular areas either adjacent to and/or potentially affected by the Bering-Norton OCS lease sale (i.e. the study area) extend from the coastal village of Shishmaref in the north to and including the entire coastline of the Seward Peninsula, Norton Sound, and the Yukon Delta to the south, including the Bering Strait islands of Little Diomedede (Inalik), King (Ukiuvok), St. Lawrence (Sevoukak), and Sledge (Ayak). Qualitative analysis of the rural, primarily but not exclusively Inupiat or Yupiit (northern and southern Eskimo respectively) sociocultural systems of this area, and the articulation of these systems with the more urban, internal and external, primarily non-Native components of the area's systems in their entirety. The baseline portion of this study is not static but rather dynamically examines the sociocultural systems prehistorically and historically.	obtained	Marie Lowe	Qualitative		
CA Class II Anthropogenic Activities	Bering-Norton Socioeconomic Impact Assessment 1980 MMS OCS 54-2	This document includes the non-OCS case and impacts projection of the Bering-Norton sociocultural systems analysis and should be considered in conjunction with the baseline study. The baseline study is contained in Volume I, "Bering-Norton Petroleum Development Scenarios, Sociocultural Systems Analysis," (1980).	obtained	in hand	Qualitative		
CA Class II Anthropogenic Activities	Norton Sound/Yukon Delta Sociocultural Systems Baseline 1981 MMS OCS 72	Baseline economic and cultural data for six communities on or near the Yukon River Delta.- Alakanuk, Emmonak, Kotlik, Mountain Village, Sheldon Points and Stebbins.	obtained	in hand	Table	Establish baseline for community level social indicators.	Medium
CA Class II Anthropogenic Activities	Baseline Ethnographic Descriptions of the NANA and Aleutian Pribilof Regions 1983 MMS OCS 77	Primary ethnographic and secondary quantitative data collected to ascertain how and in what ways a systematic monitoring of community well-being and stress can be conducted. NANA Region	obtained	in hand	Qualitative		
CA Class II Anthropogenic Activities	Socioeconomic and Sociocultural Baseline Data Unalakleet 1984 MMS OCS 90	Baseline ethnographic information on the sociocultural and socioeconomic systems of Unalakleet. The researchers gathered field data through the use of anthropological observations of daily activities and protocol observations (focused responses to sets of topics resembling open-ended interviews). The ethnographic baseline describes the social, economic and cultural systems in Unalakleet with particular emphasis on their linkages to the harvest of renewable resources.	obtained	in hand	Table	Baseline socioeconomic data at the community level.	Medium.

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class II Anthropogenic Activities	Socioeconomics of Norton Sound 1984 MMS OCS 99	Data on the following research categories were collected: demography, economy (traditional and cash), social structure, attitudes and values, infrastructure, and access-exposure for Emmonak, Golovin, Nome, Savoonga and Unalakleet. Primary data was collected at the institutional level as well as the domestic-family level.	obtained	in hand	Table	Baseline socioeconomic data at the community level.	Medium
CA Class II Anthropogenic Activities	Community Economic and Demographic Systems Analysis of the North Basin Lease Sale 1984 MMS OCS 111	Economic baseline data for the community of Nome 1984.	obtained	in hand	Table	Economic baseline data at the community level.	Medium
CA Class II Anthropogenic Activities	Institutional Change in Nome 1980-1986 MMS OCS 127	Demographic, land tenure and use, economic and employment, subsistence, crime rate, transfer payment, infrastructure data collected for an an assessment of institutional and sociocultural change in the City of Nome, Alaska over the period 1980-1986.	obtained	in hand	Table	Socioeconomic baseline data at the community level.	Medium
CA Class II Anthropogenic Activities	Kotzebue Sociocultural Monitoring 1988 MMS OCS 130	Socioeconomic baseline data for the community of Kotzebue 1970-1988.	obtained	in hand	Table	Socioeconomic baseline data at the community level.	Medium
CA Class II Anthropogenic Activities	Nome Sociocultural Monitoring 1989 MMS OCS 131	Data on demography and employment, formal and informal social institutions and infrastructure collected for an analysis of sociocultural and socioeconomic conditions in Nome, the administrative and commercial center for a northwest Alaska region of 15 Inupiaq villages	obtained	in hand	Table	Socioeconomic baseline data at the community level.	Medium
CA Class II Anthropogenic Activities	Demographic and Employment Data of Alaska Northern Communities 1988 MMS OCS 137	Broad demographic and employment trends affecting Alaska Natives or rural Alaska communities compared to State and national trends for the communities of Barrow, Anaktuvuk Pass, Kaktovik, Point Hope, Wainwright, Kotzebue, Deering, Kivalina, Nome, Gambell, Unalakleet, Alakanuk, Aniak, Bethel, Scammon Bay, Dillingham, Togiak, Nikolski, St. Paul, Sand Point and Unalaska.	obtained	in hand	Table	Socioeconomic baseline data at the community level.	Medium
CA Class II Anthropogenic Activities	Economic and Demographic Systems in Nome 1990 MMS OCS 144	Employment and population impact models for Nome 1980-2001.	obtained	in hand	Socioeconomic impact model		
CA Class II Anthropogenic Activities	Abundance and age and length compositions of Arctic grayling in the Sinuk River, 2003	This report describes abundance for Arctic grayling in the Sinuk River from a mark recapture experiment in August 2003.	need to request		Unknown	This report will provide information on Arctic grayling abundance in the Sinuk River.	
CA Class II Anthropogenic Activities	Range Survey of the Seward Peninsula Reindeer Ranges, Alaska	Seward peninsula reindeer grazing allotments with forage condition.	available online	Stephanie Martin			

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class IIIa Non-native Species	AKEPIC - Alaska Exotic Plants Information Clearinghouse	AKNHP maintains an updated georeferenced non-native plant data for the state. Roughly 100,000 collection points for 150 or so species, including all the potentially relevant species in the REA.	obtained	Matt Carlson		These data supply location information for populations of non-native plants. Data is also present on vegetation type, disturbance type, population size, percent cover, etc.	High
CA Class IIIa Non-native Species	USGS Nonindigenous Aquatic Species Database	The Nonindigenous Aquatic Species (NAS) information resource for the United States Geological Survey is located at Gainesville, Florida. This site has been established as a central repository for spatially referenced biogeographic accounts of introduced aquatic species. The program provides scientific reports, online/realtime queries, spatial data sets, regional contact lists, and general information. The data is made available for use by biologists, interagency groups, and the general public. The geographical coverage is the United States.	available online		Vector	These data may be used to identify locations of and potential pathways for invasive species into the Seward Penn. REA	Potentially suitable
CA Class IIIa Non-native Species	AKNHP Invasive Animal Species Database	This geodatabase contains spatial data for select invasive species collected from online databases and digitized maps from reports and journal articles.	obtained		Vector	These data may be used to identify locations of and potential pathways for invasive species into the Seward Penn. REA	Potentially suitable
CA Class IIIb Nuisance Native Species & Diseases	Forest Insect and Disease Conditions in Alaska	This data represents areas of forest damage due to insect infestation, fire, flood, landslides, and windthrow. The information was collected, cooperatively by aerial surveys by both the USFS, Forest Health Protection (FHP) and ADNR, Div. of Forestry. Surveys are conducted primarily in July and August so that pest "signatures" may be identified during the optimal period for symptom development of ocular estimation. The aerial survey is coordinated such that the maximum extent of recent bark beetle damage (fading trees) and insect defoliation (discoloration, foliage loss) patterns may be determined. Surveys are flown in Southeast Alaska, Southcentral Alaska and Interior Alaska. The data represents a 10 year cumulative effect for 1989-2010.	obtained	Monica McTeague	Polygon	These data will be used to assess forest damage due to insect infestations.	High
CA Class IV Climate Change	800 m PRISM Monthly Precipitation		obtained	SNAP	Raster		
CA Class IV Climate Change	800 m PRISM Monthly Temperature		obtained	SNAP	Raster		
CA Class IV Climate Change	Historical CRU data: temperature and precipitation	Historical datasets are derived from Climate Research Unit (CRU) data and include years 1901-2009 for temperature and 1901-2006 for precipitation. They are downscaled to 2km grid cells.	obtained	SNAP	Ascii text files		

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class IV Climate Change	SNAP's downscaled outputs from five IPCC Global Circulation Models: temperature and precipitation	The following datasets are climate projections for the state of Alaska based on downscaled outputs (2 km grid cells) from five IPCC Global Circulation Models that perform the best in Alaska (ECHAM5, GFDL21, MIROC, HAD, CCCMA & the 5 model average/composite mean values from all five models). They include average monthly air temperature (degrees Celsius) and total monthly precipitation (millimeters; SWE) grids for the state of Alaska. Each file contains grids for the entire state for the years 1980-2099. The three emission scenarios (A2, A1B and B2) refer to the IPCC emission scenarios used in our modeling, where A1B is the midrange scenario, A2 is more pessimistic (higher emissions) and B1 is more optimistic (lower emissions).	obtained	SNAP	database of model parameters		
CA Class IV Climate Change	SNAP's derived climate projections: date of thaw, date of freeze up and length of growing season	The following datasets are derived climate projections for the state of Alaska based on downscaled outputs (2 km grid cells) from the average of the five IPCC Global Circulation models that perform the best in Alaska (ECHAM5, GFDL21, MIROC, HAD, CCCMA) and the 5 model average for all three emission scenarios. Available data include decadal mean and standard deviation (by year and month) for 1) Date of Thaw, 2) Date of Freeze up and 3) length of growing season. Date of thaw and date of freeze were derived by creating a running average of mean monthly values and interpolating on what ordinal day these values crossed the freezing point. Length of growing season is the number of days between these two derived dates. Each file contains grids for the entire state for the years 1980-2099.	available online	SNAP	database of model parameters		
CA Class IV Climate Change	SNAP's derived climate projections: temperature and precipitation	The following datasets are derived climate projections for the state of Alaska based on downscaled outputs (2 x 2 km) from the average of the five IPCC Global Circulation models that perform the best in Alaska (ECHAM5, GFDL21, MIROC, HAD, CCCMA) and the 5 model average for all three emission scenarios. Available data include decadal mean and standard deviation (by year and month) for 1) air temperature (degrees Celsius) and 2) precipitation (millimeters; SWE). Each file contains grids for the entire state for the years 1980-2099.	available online	SNAP	Ascii text files		
CA Class IV Climate Change	NRCS SNOTEL snowpack and climate data	The Natural Resources Conservation Service (NRCS) installs, operates, and maintains an extensive, automated system to collect snowpack and related climatic data in the Western United States called SNOTEL (for SNOWpack TELemetry). The system evolved from NRCS's Congressional mandate in the mid-1930's "to measure snowpack in the mountains of the West and forecast the water supply." The programs began with manual measurements of snow courses; since 1980, SNOTEL has reliably and efficiently collected the data needed to produce water supply forecasts and to support the resource management activities of NRCS and others. Climate studies, air and water quality investigations, and resource management concerns are all served by the modern SNOTEL network. The high-elevation watershed locations and the broad coverage of the network provide important data collection opportunities to researchers, water managers, and emergency managers for natural disasters such as floods. Three SNOTEL sites occur within the ecoregion: 1) Paragon Creek (2001-present), 2) Rocky Point (2001-present) and 3) Johnson's Camp (2003-present). Data available from these sites include: AT, Precip accumulation, RH, Snow Depth, Solar Radiation, WD/WS.	available online	SNAP	Point		

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class IV Climate Change	UAF Water & Environmental Research Center Meteorologic Data	The UAF Water and Environmental Research Center (WERC) maintains 5 full meteorologic towers (2 near Council and 3 near Kougarak) within the ecoregion. Each meteorologic tower measures air temperature/relative humidity (multiple heights), wind speed and direction (multiple heights), radiation components, soil temperature (multiple depths) and soil moisture (multiple depths). Additionally, UAF WERC also maintains 4 micro-meteorologic stations that are used as repeater stations within the ecoregion. These sites are located at Anvil Mountain, the Anvil Science Academy, and Skookum Pass and record air temperature, relative humidity, wind speed and wind direction (all at one height).	available online	SNAP	Point		
CA Class IV Climate Change	NOAA/NWS/FAA Meteorologic Data	NOAA, NWS, and FAA operate and maintain a series of meteorologic stations throughout the ecoregion. These sites are located at Deering, Shishmaref, Tin City, Nome, Wailes, Gulliven, Koyuk, and Buckland. Data collected at these stations are as follows: air temperature, wind speed and direction, surface pressure, sky condition, present weather, and visibility.	need to request	SNAP	Point		
CA Class IV Climate Change	BLM RAWS Meteorologic Data	3 Remote Automated Weather Station (RAWS) are located within the ecoregion -- Haycock, Quartz Creek, and Hoodoo Hill. Measurements of precipitation, wind speed and direction, air temperature, relative humidity, and solar radiation. Haycock and Quartz Creek sites have been operational since 1988 and Hoodoo Hill since 1992.	available online	SNAP	Point		
CA Class IV Climate Change	Over-Wintering Areas Used by Dolly Varden in the Nome, Solomon, and Bonanza Rivers, Seward Peninsula, Alaska 2000/2001	This report documents critical overwintering areas for Dolly Varden in drainages where future development of large-scale mineral deposits is likely.	need to request		Unknown	This report documents critical habitat for Dolly Varden in areas where mining development is likely.	
CA Class IV Climate Change	National Snow & Ice Data Center: AMSER-/Aqua Level 3 Global Snow Water Equivalent EASE-Grids (2002-present)	Taken from the National Snow and Ice Data Center: The Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) instrument on the NASA Earth Observing System (EOS) Aqua satellite provides global passive microwave measurements of terrestrial, oceanic, and atmospheric variables for the investigation of water and energy cycles. These Level-3 Snow Water Equivalent (SWE) data sets contain SWE data and quality assurance flags mapped to Northern and Southern Hemisphere 25 km Equal-Area Scalable Earth Grids (EASE-Grids). Data are stored in Hierarchical Data Format - Earth Observing System (HDF-EOS) format, and are available from 19 June 2002 to the present via FTP. Sensor: Advanced Microwave Scanning Radiometer for the Earth Observing System (AMSR-E) Product: AMSER-/Aqua Level 3 Global Snow Water Equivalent EASE-Grids Data provider: National Snow and Ice Data Center Resolution: 25-km grids Spatial extent: global Temporal Resolution: monthly composites Period of observation: June 2002 to current	obtained	SNAP			

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CA Class IV Climate Change	National Snow & Ice Data Center: Global Monthly EASE-Grid Snow Water Equivalent Climatology (July 1987-May 2007)	Taken from National Snow and Ice Data Center: This data set comprises global, monthly satellite-derived Snow Water Equivalent (SWE) climatologies from November 1978 through May 2007, with periodic updates released as resources permit. Global data are gridded to the Northern and Southern 25 km Equal-Area Scalable Earth Grids (EASE-Grids). Global snow water equivalent is derived from Scanning Multichannel Microwave Radiometer (SMMR) and selected Special Sensor Microwave/Imagers (SSM/I). Northern Hemisphere data are enhanced with snow cover frequencies derived from the Northern Hemisphere EASE-Grid Weekly Snow Cover and Sea Ice Extent Version 2 data (these data were not produced for the Southern Hemisphere). These data are suitable for continental-scale time-series studies of snow cover and water equivalent. The data are binary data files and PNG images, and are available via FTP. Sensor: Special Sensor Microwave/Imager (SSM/I) Product: Global Monthly EASE-Grid Snow Water Equivalent Climatology Data provider: National Snow and Ice Data Center Resolution: 25-km grids Spatial extent: global Temporal Resolution: monthly composites Period of observation: July 1987 through May 2007	obtained	SNAP			
CE Class I Terrestrial Coarse Filter	Oil_Gas Potential EPCA 3	inventory of all onshore Federal lands to identify: “the United States Geological Survey estimates of the oil and gas resources underlying these lands; and “the extent and nature of any restrictions or impediments to the development of the resources...”	obtained	Varley	Polygon		
CE Class I Terrestrial Coarse Filter	National Wetlands Inventory (NWI)	This data set represents the extent, approximate location and type of wetlands and deepwater habitats in the Alaska, United States. These data delineate the areal extent of wetlands and surface waters as defined by Cowardin et al. (1979).	obtained	Monica McTeague	Polygon		
CE Class I Terrestrial Coarse Filter	Watershed Boundary Database	AK?	obtained	Varley	Polygon		
CE Class I Terrestrial Coarse Filter	LANDFIRE Biophysical Settings	The Biophysical Settings (BpS) layer represents the vegetation that may have been dominant on the landscape prior to Euro-American settlement and is based on both the current biophysical environment and an approximation of the historical disturbance regime. http://www.landfire.gov/version_comparison.php	obtained	Monica McTeague	Raster	Assessment of long-term trends in extent for Coarse-filter CEs; assessment of fire regime departure	Low suitability due to low accuracy assessments.
CE Class I Terrestrial Coarse Filter	LANDFIRE Existing Vegetation Type	The Existing Vegetation Type (EVT) layer represents the vegetation currently present; as defined by NatureServe terrestrial ecological systems classification (with some modifications). http://www.landfire.gov/NationalProductDescriptions21.php	obtained	Monica McTeague	Raster	Possibly use to fill gaps in mosaiced existing vegetation maps for the REA	Low suitability due to low accuracy assessments across AK (17-47%).

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class I Terrestrial Coarse Filter	LANDFIRE Reference Vegetation Data	Georeferenced & labelled samples of vegetation gathered by Landfire to use as training data for their mapping & modeling efforts. Each sample is labeled with an ecological system. Includes species composition & cover, structural variables, some disturbance information, and calculated fuels data. Environmental data (elev, aspect, slope, soils, etc) are not included.	requested	Boucher	Point	Input for spatial models of current distributions scenarios	High; but label errors
CE Class I Terrestrial Coarse Filter	Landfire Rapid Assessment models	These are models created during the LANDFIRE rapid assessment stage. These models, by and large, have been superceded by the LANDFIRE national models. However, they are valuable for reference	obtained		Model database	For input to refinement of existing conceptual models	Low suitability due to low accuracy assessments
CE Class I Terrestrial Coarse Filter	NatureServe Aquatic Element Occurrence Data for AK	NatureServe, in collaboration with its member Natural Heritage Programs and Conservation Data Centres, maintains a database of rare and imperiled species and plant communities across the United States and Canada. The Element Occurrence (EO) records that form the core of the NatureServe database include information on the location, status, characteristics, numbers, condition, and distribution of elements of biological diversity using established Natural Heritage Methodology developed by NatureServe and The Nature Conservancy (TNC). An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.	need to request	Tracey Gotthardt	Polygon		
CE Class I Terrestrial Coarse Filter	USFWS Critical Habitat Data Set	These data identify, in general the areas where final critical habitat exist for species listed as threatened or endangered. Two species are identified for AK. The Eider, Steller's and Eider, Spectacled.	available online		Vector		
CE Class I Terrestrial Coarse Filter	National Land Cover Database - Alaska	The National Land Cover Database (NLCD) 2001 is a Landsat-derived, 30 meter spatial resolution digital land cover map that describes the land cover for the 50 U.S. states and Puerto Rico using twenty consistent land cover classes. The NLCD 2001 Alaska land cover classification covers the entire state of Alaska at the 30 meter spatial resolution.	available online		Raster	The NLCD data is a coarse land cover map and will primarily be used as supplemental data or in areas with land cover data gaps.	Medium suitability, due to it's coarse scale.
CE Class I Terrestrial Coarse Filter	NPS Arctic Network Mosaic Map	An ecological land survey (ELS) that inventoried and classified ecosystems in the Arctic Network, including a 12 mile buffer and Selawik National Wildlife Refuge.	obtained		Raster	The ARNC land cover map will be used as a base layer for ecosystem types in the region and will be used to mosaic for a comprehensive land cover map for the REA study area.	High

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class I Terrestrial Coarse Filter	Bering Land Bridge Landcover Map	A landcover map of the Bering Land Bridge National Preserve and surrounding area produced from Landsat satellite imagery.	obtained	Monica McTeague	Raster	Integrate land cover map into a comprehensive mosaic map for the REA project area.	
CE Class I Terrestrial Coarse Filter	Ducks Unlimited - AK Earthcover	This Erdas Imagine format file is a mosaic of multiple final maps from earth cover mapping projects throughout Alaska accomplished through cooperative agreements between Ducks Unlimited, Inc., the USDI Bureau of Land Management, the USDI Fish and Wildlife Service, and several other Federal, State, and local cooperators.	obtained	Monica McTeague	Raster	This landcover map will be mosaicked with other landcover maps by developing a consistent classification.	High
CE Class I Terrestrial Coarse Filter	NRCS Range Survey of the Seward Peninsula - Landcover	An aerial photo interpretation landcover map of the Seward Peninsula. Existing vegetation was mapped as part of this effort using a modified Viereck classification with 167 land cover classes.	obtained	Monica McTeague	Polygon	The plan is to mosaic this map with other existing land cover maps to develop a consistent classification for the entire REA study area.	High
CE Class I Terrestrial Coarse Filter	Alaska NVCS Plant Associations	This is a complete list of all NVCS plant associations currently described for Alaska. Each association is linked to a project area from studies that specifically describe each plant association. Global and state ranks have been identified.	obtained		Table	This list of plant associations will help identify rare and sensitive plant associations within the REA.	High
CE Class I Terrestrial Coarse Filter	Alaska State Surficial Geology Map	State-wide map of surficial geology.	obtained	Monica McTeague	Polygon	Potentially used as a habitat variable to identify species assemblages.	Medium, depending on if finer-scale surficial geology is needed.
CE Class II Terrestrial Fine Filter	Critical Habitat	These datasets identify the areas (in general) where final critical habitat for a variety of threatened and endangered plant and animal species occurs	obtained		Polygon		

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class II Terrestrial Fine Filter	NatureServe Terrestrial Element Occurrence Data for AK	NatureServe, in collaboration with its member Natural Heritage Programs and Conservation Data Centres, maintains a database of rare and imperiled species and plant communities across the United States and Canada. The Element Occurrence (EO) records that form the core of the NatureServe database include information on the location, status, characteristics, numbers, condition, and distribution of elements of biological diversity using established Natural Heritage Methodology developed by NatureServe and The Nature Conservancy (TNC). An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.	obtained		Polygon	Location of CEs, input to distribution models	suitable for use
CE Class II Terrestrial Fine Filter	Biotics Database - Vascular Plants	AKNHP maintains georeferenced G3-G1 vascular plant collection locations for for AK. Habitat descriptions are included in some cases. ArcMap shape file is in the process of being updated with new collection records from UAM - projected time for completion in 31 May 2011. Currently, file is not separated by individual species.	obtained	Matt Carlson		These data supply location information for populations of rare plants. Additional habitat and rarely population size data are present for species.	High; but location information may not be up to date for all species.
CE Class II Terrestrial Fine Filter	Biotics Database - Lichens	AKNHP has initiated a draft G1-G3 georeferenced lichen collection location database for for AK. AKNHP is still soliciting expert opinion regarding the conservation status of these species. Habitat descriptions are available in some cases. Currently, file is not separated by individual species.					
CE Class II Terrestrial Fine Filter	Arctos	University of Alaska Museum maintains Arctos database with georeferenced collections of plants, including <i>Vaccinium uliginosum</i> , <i>Rubus chamaemorus</i> , and <i>Empetrum nigrum</i>				These data supply location information for populations of rare plants. Additional habitat and rarely population size data are present for species	High; but location information may not be up to date for all species.
CE Class II Terrestrial Fine Filter	AKNHP Polygon range maps - terrestrial vertebrate species; BIRDS	This dataset contains individual bird species range polygon shapefiles, compiled by the Alaska Natural Heritage Program. Whenever possible, shapefiles indicate seasonal occurrence (e.g. breeding, wintering, spring/fall migration).	obtained		Polygon	Current distribution of terrestrial CEs	Medium. Suitable for this use at a very coarse level
CE Class II Terrestrial Fine Filter	AKNHP Polygon range maps - terrestrial vertebrate species; MAMMALS	This dataset contains individual mammal species range polygon shapefiles, compiled by the Alaska Natural Heritage Program. Whenever possible, shapefiles indicate seasonal occurrence (e.g. breeding, wintering, spring/fall migration).	obtained		Polygon	Current distribution of terrestrial CEs	Medium. Suitable for this use at a very coarse level

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class II Terrestrial Fine Filter	AKNHP Polygon range maps - terrestrial vertebrate species; FISHERIES	This dataset contains individual fish species range polygon shapefiles, compiled by the Alaska Natural Heritage Program. Whenever possible, shapefiles indicate seasonal occurrence (e.g. breeding, wintering, spring/fall migration).	obtained		Polygon	Current distribution of terrestrial Ces	Medium. Suitable for this use at a very coarse level
CE Class II Terrestrial Fine Filter	AKNHP Terrestrial Vertebrate Element Occurrence (EO) Data	NatureServe, in collaboration with its member Natural Heritage Programs and Conservation Data Centres, maintains a database of rare and imperiled species and plant communities across the United States and Canada. The Element Occurrence (EO) records that form the core of the NatureServe database include information on the location, status, characteristics, numbers, condition, and distribution of elements of biological diversity using established Natural Heritage Methodology developed by NatureServe and The Nature Conservancy (TNC). An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.	obtained		point and polygon	Current distribution of terrestrial Ces	High
CE Class II Terrestrial Fine Filter	AK GAP Analysis Terrestrial Vertebrate Occurrence Database	This dataset contains point occurrence records for individual bird and mammal species acquired from numerous data sources for the AK Gap Analysis Project.	obtained		Point	Current distribution of terrestrial Ces	High
CE Class II Terrestrial Fine Filter	North American Breeding Bird Survey	The BBS is a long-term, large-scale, international avian monitoring program initiated in 1966 to track the status and trends of North American bird populations. The BBS was not initiated in Alaska until 1980. This dataset contains statewide BBS routes from 1980-2009.	obtained		Point	Current distribution of terrestrial Ces	High
CE Class II Terrestrial Fine Filter	Western Alaska Yellow-billed Loon Survey 2005, 2007	This dataset summarizes results from a yellow-billed loon (<i>Gavia adamsii</i>) aerial survey conducted in and around Bering Land Bridge National Preserve (BELA) and Cape Krusenstern National Monument (CAKR) in June 2005 and 2007. All lakes larger than 7 hectares were searched on twenty-four 12km x 12km plots.	obtained		Point	Current distribution of terrestrial Ces	High
CE Class II Terrestrial Fine Filter	Yellow-billed Loon Register for Alaska	The Yellow-billed Loon registry is a database that contains a review of all YBLO sightings from gray literature and ongoing surveys. The database has two main components, an OCCURRENCE file that describes each observation of a loon group, individual, nest, or brood, and a SURVEY file that contains descriptive information for each survey conducted. It provides tools to aid in visually displaying and querying data on both species occurrence and survey coverage in a specified area.	obtained		Point	Current distribution of terrestrial Ces	High
CE Class II Terrestrial Fine Filter	Breeding Bird Inventory of Alaska Army National Guard Training Areas	This dataset summarizes results from point-based landbird surveys conducted at Alaska Army National Guard Training Areas throughout Alaska.	obtained		Point	Current distribution of terrestrial Ces	Moderately suitable

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CE Class II Terrestrial Fine Filter	Lower Yukon-Kuskokwim River Breeding Bird Survey	This dataset summarized aural point count observations for landbirds along the lower Yukon and Kuskokwim Rivers between 1988 and 2002. Protocols used were similar to the land-based Breeding Bird Survey, except that listening stops were along the banks of the river.	obtained		Point	Current distribution of terrestrial Ces	Suitable
CE Class II Terrestrial Fine Filter	Greater White-fronted Goose breeding pair survey in Northwest Alaska	This dataset contains aerial survey information designed to monitor abundance, distribution, harvest, breeding biology, survival, and disease in midcontinent greater white-fronted geese that breed in Alaska, both in boreal, and tundra habitats. Other nesting waterfowl species were also recorded during surveys, including Canada Goose.	obtained		Point	Current distribution of terrestrial Ces	Suitable
CE Class II Terrestrial Fine Filter	Waterbird Abundance and Distribution on Selawik National Wildlife Refuge	Surveys were flown to estimate abundance and map distribution of water birds in June 1996 and 1997 on Selawik National Wildlife Refuge (SNWR) and nearby Noatak Lowlands. An estimated 354,000 ducks, 30,000 geese, and 4,000 loons were present on the survey area in June 1996. Estimates for the 1997 survey were 268,000 ducks, 24,000 geese, and 2,000 loons. The 1996 survey was flown in mid- to late- June whereas the 1997 survey was flown in early June. A computerized geographic information system (GIS) was used to map bird locations and densities for most species. The highest concentrations of waterfowl occurred on the Noatak and Kobuk River deltas as well as the habitat east of Selawik Lake along the Selawik and Tagagawik rivers. Densities were generally lower for the Noatak Lowlands and the area north of the Waring Mountains. The aerial survey systematic design and GIS analyses provide detailed water bird abundance and distribution information. Results can be compared to those from the North American Waterfowl Breeding Population Survey on SNWR to evaluate both designs and improve subsequent surveys to meet specific objectives. Maps can be used as data layers for further analyses such as creating stratified survey designs and examining relationships between remotely sensed habitat data and water bird distribution.	obtained		Point	Current distribution of terrestrial Ces	Suitable
CE Class II Terrestrial Fine Filter	Black Scoter Monitoring Surveys	This dataset contains aerial survey observations recorded during monitoring surveys of Black Scoter (<i>Melanitta nigra</i>) breeding populations in western Alaska tundra wetlands. Surveys were conducted from 12-21 June 2004 and from 13-24 June 2005.	obtained		Point	Current distribution of terrestrial Ces	Suitable
CE Class II Terrestrial Fine Filter	King Eider telemetry dataset, northern Alaska	This dataset contains satellite telemetry location information from King Eiders in northern Alaska.	obtained		Point	Current distribution of terrestrial Ces	Unknown
CE Class II Terrestrial Fine Filter	Inventory of Montane-Nesting Birds in the Arctic Network of National Parks, Alaska 2006	The goal of this project was to document 90% of the species of montane nesting birds likely to occur in the Arctic Network Parks, covering the time period 2001 to 2003.	obtained		Point	Current distribution of terrestrial Ces	Suitable

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class II Terrestrial Fine Filter	Global Biodiversity Information Facility	GBIF is an international organisation that is working to make the world's biodiversity data accessible everywhere in the world. GBIF and its many partners work to mobilise the data, and to improve search mechanisms, data and metadata standards, web services, and the other components of an Internet-based information infrastructure for biodiversity. GBIF makes available data that are shared by hundreds of data publishers from around the world. These data are shared according to the GBIF Data Use Agreement, which includes the provision that users of any data accessed through or retrieved via the GBIF Portal will always give credit to the original data publishers. This dataset contains a query from the GBIF dataset for all CEs.	obtained		Point	Current distribution of terrestrial Ces	Suitable
CE Class II Terrestrial Fine Filter	Fur-sealing harvest records: furbearers	This dataset contains fur-sealing harvest records for furbearers throughout Alaska. Data are organized by ECUs, which are the smallest management subdivision within a game management unit, 1998-2008.	obtained		Point	Current distribution of terrestrial Ces	Questionable
CE Class II Terrestrial Fine Filter	North Pacific Seabird Colony Database	Forty-six species totaling approximately 80 million individual seabirds breed in Alaska and the Russian Far East. During the summer, seabirds gather in groups to breed and nest. These colonies are distributed on all parts of the Alaskan and Russian Far East coasts . Seabird colonies have been censused for many years and the U.S. Fish and Wildlife Service has compiled much of the census data in the North Pacific Seabird Colony Database. The database stores data on the location, breeding population size, and species composition of seabird colonies in the North Pacific. Documented colonies total 1,801 in Alaska and 484 in Far East Russia, each with a few pair to 5.75 million birds.	obtained		Point	Current distribution of terrestrial Ces	Suitable
CE Class II Terrestrial Fine Filter	Alaska Department of Fish and Game Caribou migration data	Radio collar data for Western Arctic Caribou herd	need to request	Stephanie Martin	Unknown		
CE Class II Terrestrial Fine Filter	Ungalik River Raptor Survey	This dataset contains raptor nest locations, sightings and territories observed along the Ungalik River in 1977 and 1979, and repeated again in 2008.	obtained		Point	Current distribution of terrestrial Ces	Suitable for Species Assemblages - Raptor Concentrations
CE Class II Terrestrial Fine Filter	Pacific Walrus Haulout Sites	This dataset contains known terrestrial walrus haulout sites along the Bering and Chukchi Sea coast.	requested	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Biogeography of select avian species in Alaska's National Parks	This dataset contains occurrence information for a number of avian species known to occur within Alaska's National Parks. Taxa were selected because they were identified as having the highest potential of contacting the H5N1 virus and bringing it to Alaska. Occurrence information was collected to display seasonal and potential migratory patterns to provide managers with information that could be used to identify potential transmission routes for the introduction of H5N1 virus, and ultimately, enable rapid deployment of personnel and resources to take action in the event of a known infection.	obtained		Point	Current distribution of terrestrial Ces	Suitable

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class II Terrestrial Fine Filter	Western Arctic Caribou Herd Seasonal Range and Movements	Seasonal useage polygons and telemetry data for the Western Arctic Caribou Herd, including winter, migration, calving, summer, and peripheral ranges.	obtained	Gotthardt/Walton, see data notes	Polygon, vector	Current distribution of terrestrial Ces	Highly suitable
CE Class II Terrestrial Fine Filter	Burn Perimeters within Caribou Seasonal Ranges	This dataset (map) contains burn perimeters within caribou seasonal ranges and acreage within the Kobuk-Seward Peninsula RMP Planning Area.	obtained	see data notes	Polygon	Current distribution of terrestrial Ces	Highly suitable
CE Class II Terrestrial Fine Filter	Western Arctic Caribou Herd Migration Routes	This dataset (map) contains migration routefor the Western Arctic Caribou Herd. Data were collected by ADF&G from satellite collars from 1987-2004. Data represents 251 caribou years.	obtained	Tracey Gotthardt	Vector	Current distribution of terrestrial CEs	Highly suitable
CE Class II Terrestrial Fine Filter	Population status and trend of peregrine falcons, gyrfalcons and other raptors in western and northwestern Alaska (Region V)	This dataset contains a compilation of historical and current records from 2 survey areas (Seward Peninsula and Northwest Alaska) to allow for comparative analysis of raptor occupancy.	requested	Tracey Gotthardt	Point	Current distribution of raptor nest sites and concentration areas.	Suitable
CE Class II Terrestrial Fine Filter	Marine mammal haulout sites and concentration areas	This atlas contains digitized haulout sites and concentration areas for select marine mammal species along the Bering and Chukchi sea coasts.	obtained	see data notes	Polygon, vector and jpeg	Current distribution of marine mammal haulout sites - particulalry for ice associated seals and also identification of seasonal use concentration areas.	Suitable
CE Class II Terrestrial Fine Filter	AON Subsistence Database	The AON Subsistence database consists of 631 place/year records from Alaska and Northern Canada containing annual subsistence harvest data by resource expressed in kilograms of edible harvest per capita.	obtained	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	Moderately suitable
CE Class II Terrestrial Fine Filter	2008 Fish River Aerial Beaver Cache Survey, Selawik National Wildlife Refuge	Sites of beaver structures on the Fish River, Selawik NWR, conducted by USFWS	obtained	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	2006 Fish River Aerial Beaver Cache Survey, Selawik National Wildlife Refuge	Sites of beaver structures on the Fish River, Selawik NWR, conducted by USFWS	obtained	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Moose Telemetry data	Moose telemetry points, Dates 1994-2003	obtained	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Moose Composition data	Moose composition aerial surveys	obtained	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	

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CE Class II Terrestrial Fine Filter	Musk Ox location data, Dave Gustine, Alaska Science Center	Locations of Musk Ox Capture for isotopic analysis (Gustine et al. 2011)	obtained	Tracey Gotthardt	Point	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Musk Ox range from BLM	Musk ox range map.	obtained	Tracey Gotthardt	Polygon	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Reindeer Grazing Allotments	Reindeer grazing allotment polygons, with owner name, on Seward Peninsula	obtained	Tracey Gotthardt	Polygon	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Reindeer Grazing Pressure	Information on reindeer grazing pressure at plots on the Seward Peninsula	obtained	Dave Gregovich	Point	Current distribution of terrestrial Ces	
CE Class II Terrestrial Fine Filter	Caribou range extension, Seward Peninsula	Timing of caribou range extension onto Seward Peninsula digitized from Oleson	obtained	Dave Gregovich	Line	Current distribution of terrestrial Ces	
CE Class III Physical Feature (e.g., erodable soils)	STATSGO	NRCS is now compiling the Ecological Site Descriptions for the REA and will be available in October 2011. The scale is 1:500,000 and includes Potential Natural Vegetation descriptions.	requested	Keith Boggs	Polygon		
CE Class III Physical Feature (e.g., erodable soils)	UAF Permafrost Lab's GIPL Permafrost Dynamics Model outputs	In order to assess possible changes in the permafrost thermal state and the active layer thickness, the GIPL model was implemented for the entire Alaskan permafrost domain. For this study we used an input data set with 2 x 2 km spatial resolution. Input parameters to the model are spatial datasets of mean monthly air temperature and precipitation, prescribed vegetation, soil thermal properties, and water content, which are specific for each vegetation and soil class and geographical location. The Scenarios Network for Alaska Planning (SNAP) data set was used to model climate forcing. SNAP data were derived from the five IPCC Global Circulation Models that perform the best in Alaska: ECHAM5, GFLD21, MIROC, HAD and CCCMA, These five were selected based on how closely model outputs matched climate station data for temperature, precipitation, and sea level pressure for the recent past. The outputs from these five models have been scaled down to 2 kilometer resolution using the PRISM model, which takes into account elevation, slope, and aspect. Each derived value represents a single month within a given year, based on the composite (mean) output of the five models, using the A1B emission scenario. These data include: 1) mean annual ground temperature at the base of the active layer, 2) maximum active layer thickness, 2) warming effect of snow, 3) snow depth,4) mean annual ground surface temperature and 5) thermal offset (difference between soil surface temp and base of active layer).	obtained	SNAP	Ascii text files and Grid		
CE Class III Physical Feature (e.g., erodable soils)	CALM maximum active layer depth data	The Circumpolar Active Layer Monitoring (CALM) network includes 12 countries and 80 sites. Two of these sites occur within the ecoregion: 1) Council and 2) Kougarok. End of summer maximum active layer depth data were collected in 1999, 2000-2003, 2005, 2008-2009. Data are presented as the average of all sampling points.	available online	SNAP	Point		

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CE Class III Physical Feature (e.g., erodable soils)	UAF Permafrost Lab's Ground Temperature Data	The Permafrost Lab at UAF monitors ground temperature at three sites within the ecoregion: 1) Kotzebue, 2) Nome and 3) Council (4 ecosystem types). These data are variable in terms of depth and years collected. For example, in Nome ground temperature is available from 2005-2010 at the following depths (1,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60, 61.8 cm bgs).	available online	SNAP	Point		
CE Class III Physical Feature (e.g., erodable soils)	Permafrost Characteristics of Alaska Map	From the map text: A new permafrost map of Alaska, using a terrain-unit approach for mapping permafrost distribution based on climate and surficial geology is presented in conjunction with the Ninth International Conference on Permafrost held at the University of Alaska, June 29 to July 3, 2008. This map represents the third iteration of a permafrost map for Alaska, following the circum-arctic permafrost map (Brown et al. 1997), which made minor modifications to the initial map by Ferrians (1965). To map permafrost, we developed a rule-based model (see color-coded table) that incorporated mean annual air temperatures (MAAT) from the PRISM climate map and the surficial geology map (see back), of Karlstrom et al. (1964). We used terrainpermafrost relationships developed by Kreig and Reger (1982) and our knowledge of permafrost distribution to assign permafrost characteristics to each surficial deposit under varying temperatures. Surficial geology greatly affects permafrost characteristics because of differences in topography, soil texture (which affects moisture and thermal properties) and hydrology (surface-water and groundwater). We modified the surficial geology map to update some areas with new information (e.g., eolian loess and sand, and glaciomarine deposits).	obtained	SNAP	Model database		
CE Class IV Aquatic/Wetland Coarse Filter	USGS Principal Aquifers of the 48 Conterminous United States, Hawaii, Puerto Rico, and the U.S. Virgin Islands	This map layer contains the shallowest principal aquifers of the conterminous United States, Hawaii, Puerto Rico, and the U.S. Virgin Islands, portrayed as polygons. This map layer does not include Alaska. There is however, a hard copy of an aquifer map available: http://pubs.usgs.gov/ha/ha730/ch_n/gif/N011.gif and http://pubs.usgs.gov/ha/ha730/ch_n/index.html But, there are no aquifers within the ecoregion.	available online	SNAP	Polygon	Not intended for use.	
CE Class IV Aquatic/Wetland Coarse Filter	USGS Hydrodrologic Units for Alaska - 6th level subwatersheds	This data set is a complete digital hydrologic unit boundary layer to the Subwatershed (12-digit) 6th level for Alaska. This data set consists of geo-referenced digital data and associated attributes created in accordance with the "Federal Guidelines, Requirements, and Procedures for the National Watershed Boundary Dataset; Chapter 3 of Section A, Federal Standards, Book 11, Collection and Delineation of Spatial Data; Techniques and Methods 11-A3" (04/01/2009). http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/index.html . Polygons are attributed with hydrologic unit codes for 4th level sub-basins, 5th level watersheds, 6th level subwatersheds, name, size, downstream hydrologic unit, type of watershed, non-contributing areas and flow modification.	obtained	Rebecca Shaftel	Polygon	This subwatershed dataset will be used for display purposes and also for analyses that include localized change agents (such as development) and the potential distribution of their effects on downstream aquatic resources.	High, although the National Hydrography Dataset may be more useful for tracking pollution transport in the stream network.

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CE Class IV Aquatic/Wetland Coarse Filter	USGS Nation Hydrography Dataset for Alaska - High Resolution	The National Hydrography Dataset (NHD) is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD data was originally developed at 1:100,000-scale and exists at that scale for the whole country. This high-resolution NHD, generally developed at 1:24,000/1:12,000 scale, adds detail to the original 1:100,000-scale NHD. (Data for Alaska, Puerto Rico and the Virgin Islands was developed at high-resolution, not 1:100,000 scale.) Local resolution NHD is being developed where partners and data exist. The NHD contains reach codes for networked features, flow direction, names, and centerline representations for areal water bodies. Reaches are also defined on waterbodies and the approximate shorelines of the Great Lakes, the Atlantic and Pacific Oceans and the Gulf of Mexico. The NHD also incorporates the National Spatial Data Infrastructure framework criteria established by the Federal Geographic Data Committee.	obtained	Rebecca Shaftel	Line	The NHD will be used to display aquatic habitats (streams, rivers, ponds, and lakes) and also for modelling change agent effects through the stream network.	Very high
CE Class IV Aquatic/Wetland Coarse Filter	USGS National Water Information System	NWIS supports the acquisition, processing, storage and dissemination of information about water quantity and quality collected at over 1.5 million sites around the U.S. As a long-term database and information delivery system, NWIS provides continual access to data collected over the last 100+ years, as well as real-time data on streamflow, etc.	need to request	Rebecca Shaftel	Site locations (point) with hydrologic and WQ data		
CE Class IV Aquatic/Wetland Coarse Filter	National Geophysical Data Center: Thermal Springs List for Alaska	This dataset originated from a query for the state of Alaska from the thermal springs database managed by the National Geophysical Data Center. Latitude and longitude were provided and the entire dataset was copied into Excel and projected in GIS. Seven thermal springs are located within the project area. The database includes information on common name, location, temperature in fahrenheit and celsius, and USGS quadrangle.	obtained	Rebecca Shaftel	Point	This dataset shows the locations of thermal springs in the project area. It is unknown if the springs provide special habitat needs for the freshwater fish conservation elements (ie. overwintering habitat, food resources in winter, etc.).	
CE Class IV Aquatic/Wetland Coarse Filter	USGS Discharge Data	The USGS has collected river/stream discharge at >100 locations throughout the ecoregion. Of these stations, only the Kobuk River near Kiana is currently operational.	available online	SNAP	Point		
CE Class IV Aquatic/Wetland Coarse Filter	NWS Daily River Stage	The National Weather Service observes river stage of the Snake River near Nome (at the bridge). Daily observations of river stage, and breakup conditions, are made daily. These observational data are available online.	available online	SNAP	Point		
CE Class IV Aquatic/Wetland Coarse Filter	NOAA Environmental Sensitivity Index for Western and Northwest Arctic Alaska	This data set contains sensitive biological resource data for marine, estuarine, and anadromous fish species in Western Alaska. Vector polygons in this data set represent fish distribution. Species-specific abundance, seasonality, status, life history, and source information are stored in relational data tables (described below) designed to be used in conjunction with this spatial data layer. This data set comprises a portion of the Environmental Sensitivity Index (ESI) data for Western and Northwest Arctic Alaska. ESI data characterize the marine and coastal environments and wildlife by their sensitivity to spilled oil. The ESI data include information for three main components: shoreline habitats, sensitive biological resources, and human-use resources. See also the FISHL (Fish Lines) data layer, part of the larger Western and Northwest Arctic Alaska ESI database, for additional anadromous fish information.	obtained	Rebecca Shaftel	geodatabase	This data will help identify three things: sensitive habitat along the coastline, types of shoreline habitat (from rocky to mudflats), and fish species composition and use of coastal habitats.	High.

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CE Class V Aquatic/Wetland Fine Filter	ADF&G Anadromous Waters Catalog	The Alaska Department of Fish and Game's (ADF&G) Anadromous water bodies data is derived from the ADF&G's GIS shapefiles for the "Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes" (referred to as the "Catalog") and the "Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes" (referred to as the "Atlas"). It is produced for general visual reference and to aid users in generating various natural resource analyses and products. The shapefiles depict the known anadromous fish bearing lakes and streams within Alaska (from the mouth to the known upper extent of species usage). It incorporates data from a variety of sources including: USGS Digital Line Graph (DLG) and National Hydrography Dataset (NHD) hydrography data; Alaska Department of Natural Resources hydrography layer; and ADF&G shapefiles for the "Atlas" and "Catalog". ADF&G updates the Anadromous Streams data regularly. Note that stream numbers, locations, extent of cataloged habitat or species utilization of a given stream may change from year to year. Data for the shapefiles are current as of the 2010 revision of the "Atlas to the Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes" and the "Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes" effective June 1, 2010. Three data layers were downloaded to cover the project area: Arctic, Interior, and West regions.	obtained	Rebecca Shaftel	Line	This dataset will be used to identify the furthest upstream distribution for the five anadromous salmon species.	High
CE Class V Aquatic/Wetland Fine Filter	ADF&G Anadromous Waters Catalog: Species and Life Stages	This dataset has the same coverage as the Anadromous Waters Catalog, except that it has additional attribute fields identifying species and life stages for individual stream segments. There are 23 species in the dataset and three life stages: present (p), spawning (s), and rearing (r). It was received from Skip Repetto, a GIS Analyst at ADF&G with the following caveat: "This is a value added representation of the AWC and has not been error checked completely, so use at your own risk; the actual AWC takes precedent."	obtained	Dan Bogan	Line	This dataset will provide cataloged distribution information for the fish species that are potentially anadromous (ie. Dolly Varden are included). It also documents their life stage for each stream segment: present, rearing, or spawning. This is not a comprehensive source of information on fish distribution as there are many areas that have not been investigated.	high

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CE Class V Aquatic/Wetland Fine Filter	ADF&G Alaska Freshwater Fish Inventory Database	<p>Alaska's abundant, remote, and predominantly pristine freshwater fish habitats are largely unexplored and undocumented. To begin filling these vast information gaps, the Alaska Freshwater Fish Inventory Database (AFFID) houses freshwater fish (anadromous and resident)-occurrence data sets compiled from a variety of sources. Most records in the AFFID come from Alaska Department of Fish and Game (ADF&G) fish and aquatic habitat inventories. However, the AFFID also includes selected recent fish-occurrence data sets from ADF&G Fish Resource Permit fish-collection reports submitted to ADF&G by other organizations (agencies, consulting firms, non-governmental organizations, and individuals) who collect fish for scientific or educational needs. ADF&G inventories are designed to identify all fish species occurring at study sites; however, other projects may have recorded only selected species. Even where efforts were made to identify all species present at the time of sampling, other species may occupy sampled waters at other times.</p> <p>The AFFID is not designed for use as a primary regulatory tool, but may be used as a reference source. The Anadromous Waters Catalog (AWC) is the regulatory tool established by statute [AS 16.05.871(a)] to specify the various rivers, lakes and streams of the Alaska are important to the spawning, rearing, or migration of anadromous fishes.</p> <p>Information presented in the AFFID is public and may be interpreted by organizations or individuals based on needs, but each user is responsible for the appropriate application. These data are intended for planning purposes--while they represent the best available observations, they do not eliminate the need for detailed study of specific sites intended for intensive uses. The AFFID is periodically updated as additional information becomes available.</p> <p>The ADF&G cannot assure the accuracy of all reported data such as species identification. In general, voucher specimens are not retained for positive identification. Before observations are added to the AFFID, however, we do carefully review submitted observations and screen for anomalous records.</p> <p>By providing more complete and more accessible fish community and habitat information, we will help our own agency, as well as other federal, state, and local resource agencies and the public better implement their respective fish habitat conservation, land use planning, and research missions and goals.</p> <p>This project was made possible, in part, by funding from the Coastal Impact Assistance Program, pursuant to National Oceanic and Atmospheric Administration Award No NA17OZ2058 and State Wildlife Grant T-1-14.</p> <p>If you would like more information concerning the Alaska Freshwater Fish Inventory program and database, please contact Joe Buckwalter, (phone 907-267-2345) Habitat Biologist, Alaska Department of Fish and Game. Or contact Skip Repetto or Ryan Snow for technical assistance with accessing or viewing AFFID data sets.</p>	obtained	Dan Bogan	Point	This dataset will provide information on survey locations conducted in the project area and all fish species found (both resident and anadromous). This is not a comprehensive source of information on fish distribution as there are many areas that have not been investigated. In addition, distributions for the resident species will have to be based on assumptions of range given the survey site where they were observed.	high

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class V Aquatic/Wetland Fine Filter	AKNHP Featured Fish Species 2006	This dataset was created by the Zoology program of the Alaska Natural Heritage Program, Anchorage, AK. It includes shapefiles of species occurrences and ranges, metadata, and species status reports. The fish species included in this project that are also CE for the REA are Alaska blackfish, Bering cisco, broad whitefish, pacific lamprey, and pygmy whitefish. The point feature shapefiles summarize statewide observations for each fish species. Points were assembled from a variety of sources including published literature, unpublished literature, and online databases. The data represent a wide variety of sources collected over many years and therefore precision and accuracy vary within the data. This coverage was intended to depict a comprehensive assemblage of observations of each species along with locational information. Many locations required transcription of textual descriptions from literature to a statewide basemap. The polygon shapefiles summarize current statewide distribution information for each fish species. The distribution boundaries are based on currently documented observations and literature, describing general distribution in Alaska. Source scale is 1:250000. The datasets are intended to describe the current known observations of each fish species in Alaska. This information was developed in association with efforts to describe life history and distribution of species featured in Alaska's Comprehensive Wildlife Conservation Strategy, which was prepared by the Alaska Department of Fish and Game and reviewed by the U.S. Fish and Wildlife Service.	obtained	Dan Bogan	Point and polygon	This dataset will be used to identify known occurrences and distribution of Alaska blackfish, Bering cisco, broad whitefish, pacific lamprey, and pygmy whitefish.	high
CE Class V Aquatic/Wetland Fine Filter	ADF&G Commercial Fish Escapements for Norton Sound, Port Clarence, and Kotzebue Sound	ADF&G has numerous projects in the Norton Sound, Port Clarence, and Kotzebue Sound area to estimate escapement of fish important to commercial fisheries. These include counting towers, weirs, test fisheries, and aerial surveys. The majority of the rivers with counting towers and weirs are in the Norton Sound district. Aerial surveys are conducted in all districts but accuracy may vary from year to year and are not always comparable. This data resides in tabular format in the fisheries reports, but could be attributed to spatial locations in GIS (e.g. lat/longs of towers or weirs or stream miles surveyed).	need to request		Table	This data will be helpful in identifying salmon and other fish identified by ADF&G that have large returns to various rivers in the study area. The rivers are limited to those that produce commercial fish species, but are relatively extensive for the Norton Sound area. Escapement estimates will be useful to identify fish species that are returning to specific watersheds and answering management questions that deal with inventory locations and change agents corresponding to fish species distributions.	High

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class V Aquatic/Wetland Fine Filter	Whitefish species harvested in spring and fall from Selawik R Delta, 2003	Abstract.—Whitefish (Family: Salmonidae, Subfamily: Coregoninae) are important food resources for residents of the Selawik River delta in northwest Alaska. Several species have been identified in the region but very little is known about their life histories. A biological sampling study was conducted during June and September 2003 to examine age and size distribution, maturity and spawning condition, the incidence of anadromy, and relative seasonal abundance of whitefish species found in the delta. Broad whitefish <i>Coregonus nasus</i> , humpback whitefish <i>C. pidschian</i> , and least cisco <i>C. sardinella</i> were abundant throughout the delta, and inconnu (sheefish) <i>Stenodus leucichthys</i> were present but relatively rare. More than 70% of the whitefish of all three major species were mature and most were actively feeding. Few juvenile fish were captured despite the use of suitable fishing gear. Age distributions were well beyond minimum age of maturity, indicating that recent harvest levels have not been excessive. A large proportion of mature broad whitefish and humpback whitefish, and all mature least cisco were coming into spawning condition during the September sampling period. Otolith microchemical procedures indicated that most broad whitefish and humpback whitefish were anadromous, while most least cisco were freshwater residents. Fish were more abundant in June than in September, but fish were in better physical condition during September. These data indicate that the Selawik River delta serves as a feeding area for these fish populations, and suggest that they spawn and rear elsewhere.	need to request		Unknown	This data will provide information on whitefish species timing and use of the Selawik River Delta. If change agents have impacts on habitat or food production in the delta, this will be important information for modeling effects on these species.	High
CE Class V Aquatic/Wetland Fine Filter	Population characteristics of sheefish in the Selawik R, 1993-1996	This research project describes the timing of the sheefish migration to spawning habitats in the Selawik River. Abundance, size, and age of migrating populations for three years are described. The timing and location of migratory behavior both before and after spawning is also provided through fish tagging.	need to request		Unknown	This data will be useful for understanding the timing, location, and size of sheefish spawning populations in the Selawik River.	high
CE Class V Aquatic/Wetland Fine Filter	Comparison of sheefish spawning abundances in the Selawik R, 1994, 2004 and 2005	Selawik River inconnu (sheefish) <i>Stenodus leucichthys</i> were sampled during the 2004 and 2005 spawning migrations using mark-recapture techniques to estimate the current abundance of the spawning population and compare it with the abundance in 1995. The 2004 and 2005 marking events were from mid-July to mid-August and the recapture events were from late August to mid-September. During the marking events, fish were primarily captured with beach seines due to turbid water conditions caused by a large permafrost thaw slump in the upper Selawik River drainage. Water clarity improved with the onset of autumn freezing, so fish were captured with hook and line during the recapture events. The estimated abundance of spawning inconnu for 2004 and 2005 was 23,652 (95% CI = 13,383 – 33,920) and 46,324 (95% CI = 25,069 – 67,580), respectively. The estimated abundance of spawning inconnu in 1995 was 5,990 (95% CI = 4,098 – 7,882), indicating that the spawning population expanded significantly during the 10 year interval. This population expansion is thought to be the result of an episodic recruitment event of young inconnu into the spawning population.	need to request		Unknown	This data will provide useful information on the size and location of the sheefish spawning population on the Selawik River.	high

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class V Aquatic/Wetland Fine Filter	Abundance and Run Timing of Adult Pacific Salmon in the East Fork Andreafsky River, Yukon Delta National Wildlife Refuge, Alaska, 2009	A resistance board weir was used to collect abundance, run timing, and biological data from salmon returning to the East Fork Andreafsky River, a tributary to the lower Yukon River, between June 22 and August 3, 2009. An estimated 3,004 Chinook salmon <i>Oncorhynchus tshawytscha</i> migrated through the weir. Seven age groups were identified from 2,582 Chinook salmon sampled, with age 1.4 (59%) dominant. The sex composition was 45% female. An estimated 8,770 summer chum salmon <i>O. keta</i> migrated through the weir. Five age groups were identified from 781 summer chum salmon sampled, with ages 0.3 (35%) and 0.4 (40%) dominating. The sex composition was 39% female. An estimated 2,395 pink salmon <i>O. gorbuscha</i> , 84 sockeye salmon <i>O. nerka</i> , and four coho salmon <i>O. kisutch</i> were counted through the weir. Other species counted through the weir during 2009 included 3,755 whitefish (Coregoninae), two Arctic grayling <i>Thymallus arcticus</i> , four Dolly Varden <i>Salvelinus malma</i> , and 73 northern pike <i>Esox lucius</i> .	need to request		Unknown	This dataset will provide current information on the abundance, species, and life history of salmon and other resident fish on the East Fork of the Andreafsky River.	high
CE Class V Aquatic/Wetland Fine Filter	Abundance and Run Timing of Adult Salmon in the Gisasa River, Koyukuk National Wildlife Refuge, Alaska, 2009	A resistance board weir was operated by the U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Field Office to collect information on abundance, run timing, and biology of returning adult Chinook salmon <i>Oncorhynchus tshawytscha</i> and chum salmon <i>O. keta</i> in the Gisasa River. This was the fifteenth year of operating the weir at this location. In 2009, the weir was operated from June 23 through July 30. An estimated 1,955 Chinook salmon and 25,904 summer chum salmon passed through the weir. The most abundant other species was longnose sucker <i>Catostomus catostomus</i> (N = 61), followed by northern pike <i>Esox lucius</i> (N = 38), sockeye salmon <i>O. nerka</i> (N = 10), Arctic grayling <i>Thymallus arcticus</i> (N = 8), Dolly Varden <i>Salvelinus malma</i> (N = 5), and whitefish spp. (Coregoninae; N = 3). The estimated weekly sex composition for Chinook salmon ranged from 21% to 32% female fish. Three primary age classes were identified, 1.2, 1.3, and 1.4, for Chinook salmon, with a dominant age class of 1.2 (42%). The estimated weekly sex composition for summer chum salmon ranged from 33% to 71% female fish. There were two primary age classes identified, 0.3 and 0.4, with a dominant age class of 0.3 (61%).	need to request		Unknown	This dataset will provide information on abundance, species, and life history of salmon and other resident fish on the Gisasa River.	high
CE Class V Aquatic/Wetland Fine Filter	Abundance and Run Timing of Adult Salmon in the Kateel River,	A 3-year study was initiated in 2001 to collect biological information on Chinook <i>Oncorhynchus tshawytscha</i> and summer chum salmon <i>O. keta</i> migrating into the Kateel River to spawn, a tributary of the Koyukuk River, Alaska. A resistance board weir was used to assess passage rates and collect biological data. Additionally, passage information was recorded for whitefish (Coregoninae), longnose sucker <i>Catostomus catostomus</i> , Arctic grayling <i>Thymallus arcticus</i> , and northern pike <i>Esox lucius</i> . Due to unforeseen delays in transporting the weir material and field supplies to this remote site, the weir was not fully operational in 2001. In 2002, the weir was installed and operated from June 23 to July 27. A total of 73 Chinook and 2,853 summer chum salmon passed through the weir. The most abundant resident species passing through the weir were whitefish (N=13), followed by longnose sucker (N=6), Arctic grayling (N=4), and northern pike (N=3). The median passage date for Chinook salmon was July 12. Females comprised 29% of the Chinook salmon run, with age class 1.2 dominating (50%). The mean MEL length of female Chinook salmon was 710 mm, ranging from 515 to 865 mm, and male length averaged 596 mm, ranging from 410 to 845 mm. The median passage date for summer chum salmon was July 11. Females comprised 45% of the summer chum salmon run, with age class 0.3 dominating (58%). The mean MEL length of female summer chum salmon was 555 mm, ranging from 380 to 650 mm, and male length averaged 587 mm, ranging from 450 to 670 mm. In 2003, budget constraints forced the cancellation of operations in the Kateel River. It is recommended that tributary streams containing small salmon stocks, like the Kateel River, be monitored on a periodic basis.	need to request		Unknown	This dataset will provide information on the species, run sizes, and timing for the Kateel River.	high

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class V Aquatic/Wetland Fine Filter	Fish surveys in the Honhosa River, North Fork Huslia River, and Billy Hawk Creek, Koyukuk National Wildlife Refuge, Alaska, 1993	This dataset includes information on fish species found during fish surveys conducted in July and August 1993 in the Honhosa R, Huslia R, and Billy Hawk Creek. Fish species captured included northern pike, longnose sucker, three species of whitefish, Arctic grayling, chum salmon, burbot, and slimy sculpin.	need to request		Unknown	This dataset will be used to describe fish species that occur in streams of the Koyukuk National Wildlife Refuge. Both composition and abundance data will be useful for understanding potential interactions with change agents in the area.	
CE Class V Aquatic/Wetland Fine Filter	Salmon surveys on the Koyukuk and Nowitna National Wildlife Refuges, Alaska, 1993	This dataset will be useful to describe the occurrence of salmon in the Koyukuk Refuge. The study included a literature review of salmon in the refuge as well as additional sampling to target summer chum and chinook and fall chum and coho.	need to request		Unknown	This dataset will provide useful information on the species and run timing of salmon in rivers of the Koyukuk Refuge.	
CE Class V Aquatic/Wetland Fine Filter	Genetic Diversity of Dolly Varden Populations in Norton and Kotzebue Sounds	This dataset includes genetic stock structure of 12 population samples from Norton and Kotzebue sounds. In addition, samples were collected from the Wulik River subsistence fishery to perform a mixed stock analysis.	need to request		Unknown	This data provides useful information on populations of Dolly Varden in the study area. It also describes the populations that use the Wulik River as overwintering habitat and captured in the subsistence fishery.	
CE Class V Aquatic/Wetland Fine Filter	Lake Fishery Habitat Survey and Classification on Interior Alaska National Wildlife Refuges, 1984 and 1985	This dataset includes physical, chemical, and fish composition data from 24 lakes in the Koyukuk Refuge. Lat/long are provided so that fish composition could be attributed to a spatial dataset.	need to request		Table	This dataset will provide information on fish composition for lakes in the Koyukuk Refuge.	
CE Class V Aquatic/Wetland Fine Filter	Fishery Management Report for Sport Fisheries in the Yukon Management Area, 2008	This report provides information on fish of importance to sport fisheries for rivers in the study area that drain to the Yukon and Koyukok.	need to request		Unknown	This report may provide information on occurrence and abundance of fish species of importance to sport fisheries in the study area.	

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
CE Class V Aquatic/Wetland Fine Filter	Estimation of Abundance and Distribution of Chum Salmon in the Unalakleet River Drainage, 2004	Radiotelemetry and mark-recapture were used to estimate Unalakleet R chum salmon abundance and distribution (including spawning habitats).	need to request		Unknown	This report documents the distribution and abundance of chum salmon for the Unalakleet River. There is also some information on the distribution of spawning habitats.	
CE Class V Aquatic/Wetland Fine Filter	Stock Assessment of Arctic Grayling in the Nome River, 2005	This report documents abundance of Arctic grayling in the Nome River after release of reared fish. Numbers were low indicating the fishery has not recovered since closure in 1992.	need to request		Unknown	This report documents the abundance of Arctic Grayling in the Nome River.	
CE Class V Aquatic/Wetland Fine Filter	Estimation of Coho Salmon Abundance and Spawning Distribution in the Unalakleet River 2004-2006	This report describes the results of a 3 year study examining distribution of coho salmon in the Unalakleet River.	need to request		Unknown	This report will be used to describe the abundance and distribution of coho salmon in the Unalakleet River.	
CE Class V Aquatic/Wetland Fine Filter	Unalakleet River Salmon Studies 2002-2008	This report is a summary of the Unalakleet River test net projects and the North River counting tower enumeration projects.	need to request		Unknown	This report will be used to describe salmon abundance in the Unalakleet River.	
CE Class V Aquatic/Wetland Fine Filter	Anvik River Sonar Chum Salmon Escapement Study, 2009	This report describes a sonar study for Anvik R chum salmon in 2009.	need to request		Unknown	This report documents abundance of summer chum salmon for the Anvik R.	
CE Class V Aquatic/Wetland Fine Filter	Kobuk River Test Fishing Project, 2008	This report describes a drift gillnet test fishery for summer chum salmon on the Kobuk River and compares it to data from the 16 year project history. Both chum and sheefish are caught in the test fishery.	need to request				
CE Class V Aquatic/Wetland Fine Filter	Freshwater habitat quantity and coho salmon production in two rivers	This report documents rearing habitat for coho on the Nome and North rivers. The abundance of smolts produced by this habitat was modeled to estimate adult escapement.	need to request			This dataset could be used to identify coho rearing habitat for the Nome and North rivers.	
CE Class V Aquatic/Wetland Fine Filter	An ecological comparison of juvenile chum salmon from two watersheds in Norton Sound, Alaska		need to request				

Primary Data Class	Dataset Name	Data Description	Data Acquisition Status	Requestor	Data Type	Intended Use of Data	Suitability for Intended Uses
Other	Alaska Department of Fish and Game Subsistence Harvest Survey	Subsistence harvest	obtained	Stephanie Martin	Table		
PL Class I Sites of High Biodiversity	Audubon Important Bird Areas	Alaska’s IBAs are part of a growing global network of designated IBAs, spanning 156 countries around the world and 26 countries in the Western Hemisphere alone. This international effort is led worldwide by BirdLife International and in the United States by the National Audubon Society. Because every IBA across the planet has been designated and ranked against the same criteria, we often refer to IBAs as a Global Currency for Conservation. Globally, thousands of IBAs and millions of acres of avian habitat have received recognition and better protection as a result of the IBA program. So far Audubon has identified and designated 145 IBAs in Alaska, the majority of which are ranked as globally significant. In fact, Alaska has almost half of all globally significant IBAs identified in the United States so far—which is not surprising when one considers the diversity and quality of habitat found in Alaska’s 365 million acres of land, 47,000 miles of marine shoreline, and 3 million lakes and rivers.	obtained			Current distribution of high biodiversity sites	Suitable to identify areas of high biodiversity for birds
PL Class II Specially Designated Areas of Ecological Value	Alaska Protected Areas Database(PAD)	The Nature Conservancy in Alaska created this data set in order to analyze how land in Alaska is managed for biodiversity. The Nature Conservancy identifies places in Alaska that are important for the long-term conservation of Alaska's biodiversity. This analysis was part of The Nature Conservancy's project to design a Statewide Blueprint for Conservation in Alaska.	obtained	Tracey Gotthardt	Polygon	This data set is intended to identify designated areas of high biodiversity value and other managed lands for the ecoregion.	This data set is suitable for use.
PL Class II Specially Designated Areas of Ecological Value	TNC Portfolio Sites	Portfolio sites identified through ecoregional plans of Alaska TNC from early 2000s. Each of these assessments produced a map indicating areas of biological significance. Referred to as portfolios, these maps represent areas that, if managed for biodiversity, will likely conserve the native species and ecological communities of those ecoregions.	obtained	Monica McTeague	Polygon		
PL Class III Other Managed Lands	State Boundaries		obtained	Varley	Polygon		

Appendix II. Coarse-filter Conservation Elements for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA

UPLAND ECOLOGICAL SYSTEMS	LOWLAND ECOLOGICAL SYSTEMS
<p>Forest</p> <ul style="list-style-type: none"> Boreal Treeline White Spruce Woodland Boreal Spruce-Lichen Woodland Boreal White Spruce Forest Boreal Black Spruce Wet-Mesic Slope Woodland Boreal Mesic Black Spruce Forest Boreal Dry Populus balsamifera-Steppe Bluff Boreal Mesic Birch-Aspen Forest Boreal Subalpine Balsam Poplar-Aspen Woodland Boreal White Spruce-Hardwood Forest <p>Tall and Low Shrub</p> <ul style="list-style-type: none"> Arctic Mesic Alder Shrubland Arctic Scrub Birch-Ericaceous Shrubland Arctic Mesic Sedge-Willow Tundra Arctic Mesic-Wet Willow Shrubland <p>Dwarf Shrub</p> <ul style="list-style-type: none"> Arctic Non-Acidic Dryas Dwarf-Shrubland Arctic Acidic Dryas Dwarf-Shrubland Arctic Mesic Sedge-Dryas Tundra Arctic Acidic Dwarf-Shrub Lichen Tundra Arctic Non-Acidic Dwarf-Shrub Lichen Tundra Arctic Dwarf-Shrubland Arctic Permafrost Plateau Dwarf-Shrub Lichen Tundra <p>Dune</p> <ul style="list-style-type: none"> Arctic Active Inland Dune <p>Lichen</p> <ul style="list-style-type: none"> Arctic Lichen Tundra <p>Sparse Vegetation</p> <ul style="list-style-type: none"> Arctic Acidic Sparse Tundra Arctic Non-Acidic Sparse Tundra <p>Glacier and Ice Field</p>	<p>Forest</p> <ul style="list-style-type: none"> Boreal Wet Black Spruce-Tussock Woodland Boreal Black Spruce Dwarf-Tree Peatland Boreal Black Spruce-Tamarack Fen <p>Dwarf Shrub</p> <ul style="list-style-type: none"> Arctic Dwarf-Shrub-Sphagnum Peatland <p>Tussock Tundra</p> <ul style="list-style-type: none"> Arctic Shrub-Tussock Tundra Arctic Tussock Tundra Arctic Tussock-Lichen Tundra <p>Herbaceous</p> <ul style="list-style-type: none"> Arctic Freshwater Aquatic Bed Arctic Mesic Herbaceous Meadow Arctic Pendantgrass Freshwater Marsh Arctic Sedge Freshwater Marsh Arctic Wet Sedge-Sphagnum Peatland Arctic Wet Sedge Meadow <p>Polygonal Ground</p> <ul style="list-style-type: none"> Arctic Polygonal Ground Mesic Shrub Tundra Arctic Polygonal Ground Shrub-Tussock Tundra Arctic Polygonal Ground Tussock Tundra Arctic Polygonal Ground Wet Sedge Tundra Polygonal Ground mosaics <p>Floodplain</p> <ul style="list-style-type: none"> Balsam Poplar Floodplain
	AQUATIC ECOLOGICAL SYSTEMS
<p>COASTAL ECOLOGICAL SYSTEMS</p> <ul style="list-style-type: none"> Arctic Tidal Flat Arctic Coastal Sedge-Dwarf-Shrubland Arctic Coastal Brackish Meadow Arctic Tidal Marsh Arctic Marine Beach and Beach Meadow 	<ul style="list-style-type: none"> Headwater stream River Estuary & Lagoon Lowland stream and slough Freshwater Lake – deep, connected Freshwater Lake – shallow, connected Freshwater Lake – deep, isolated Freshwater Lake – shallow, isolated Hot Spring

Appendix III: Candidate Fine-Filter Conservation Elements for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA

Conservation Element	Conservation Status					Associated Habitats	Notes
	Global Rank	State Rank	AK State Wildlife Action Plans	Federal Listing	BLM		
SPECIES ASSEMBLAGES							
<i>Critical Fish Habitats</i>					SOW		<i>Subsistence importance - Likely unidentifiable</i>
<i>Marine Mammal Haul-Out Sites</i>					SOW		<i>Subsistence importance</i>
<i>Migratory Bird Habitats</i>					SOW		<i>Important for rare species</i>
<i>Raptor Concentrations</i>					SOW		
<i>Seabird colony sites</i>					SOW		<i>Important for rare species. Habitat for example, coastal cliffs at Cape Deceit</i>
ANIMALS							
Birds							
Aleutian Tern	G4	S3B	Nominee Species			Estuary, Lagoon, and Coastal Cliffs; can be included in seabird colony sites	Uncommon breeder on Seward Peninsula; population declining
Arctic Peregrine Falcon	G4T2	S3B	Nominee Species			Arctic Bedrock and Talus, Major River	
Bar-tailed Godwit	G5 ¹	S3B	Nominee Species			Arctic Polygonal Ground Wet Sedge Tundra, Arctic Dwarf-Shrubland	Common breeder in the region; declining
Black Scoters	G5	S3S4B SCS4N					USGS suggests declining population, furthest north nesting population, suggested by USGS reviewer to be included
Bristle-thighed Curlew	G2	G2, S2B	Nominee Species		Sensitive Species	Arctic Shrub-Tussock Tundra	Small population, 40% global pop. Breeds on Seward Peninsula
Common Eiders	G5	S3S4B S3N					FWS species of concern, unique habitats at Espenburg; suggested by USGS reviewer to be included
Emperor Goose	G3G4	S3S4			Sensitive Species	Arctic Tidal Marsh	Uncommon breeder on Seward Peninsula, populations depressed
Hudsonian Godwit	G4	S2S3B	Nominee Species		Watch List	Arctic Wet Sedge-Sphagnum Peatland	Rare breeder on Seward Peninsula; AK pop is small, and genetically distinct.
King Eider	G5	S3B, S3N	Nominee Species			Western North American Boreal Freshwater Emergent Marsh	
Kittlitz's Murrelet	G2	S2B, S2N	Nominee Species	Candidate for Listing	Sensitive Species	Arctic Bedrock and Talus	Relict population in Seward Peninsula, declining
McKay's Bunting	G3	S3	Nominee Species		Sensitive Species	Arctic Tidal Marsh, Arctic Marine Beach and Beach Meadow	One of NA's rarest birds, AK endemic; winters on Seward Peninsula.
Red Knot	G5 ¹	S2S3B	Nominee Species		Sensitive Species	Alpine tundra, bare ground	Subspecies <i>roselaari</i> declining; breeds on Seward Peninsula
Spectacled Eider	G2	S2B	Nominee Species	Listed as Threatened		Lowland stream, Arctic Coastal Brackish Meadow,	Rare local breeder
Yellow-billed Loon	G4	S2S3B, S3N	Nominee Species	Candidate for Listing	Sensitive Species	Lentic – shallow, closed basin, Arctic Polygonal Ground Wet Sedge Tundra	Candidate species for listing based on low populations and potentially declining trend; status on the Seward Peninsula is unknown.
<i>Canada geese</i>	G5	S5B				<i>Estuary & Lagoon, Western North American Boreal Freshwater Emergent Marsh, Arctic Coastal Brackish Meadow</i>	<i>Subsistence importance</i>

¹ Global status debated

Conservation Element	Conservation Status					Associated Habitats	Notes
	Global Rank	State Rank	AK State Wildlife Action Plans	Federal Listing	BLM		
<i>Willow ptarmigan</i>	G5	S5				Arctic Mesic-Wet Willow Shrubland	Subsistence importance
Mammals							
Alaskan hare	G3G4	S3S4	Nominee Species		Sensitive Species	Arctic Mesic-Wet Willow Shrubland	Potentially declining
Pacific walrus	G4	S3	Nominee Species			Rocky shores, islands, beaches, coastal headlands - captured within sea mammal haul-out sites	
Polar Bear	G3	S3		Listed as Threatened		Sea ice-associated habitats	
<i>Beavers</i>	G5	S5			SOW	River, Headwater Stream, Slough/Pond, Freshwater Lakes	Ecologically important - range appears to be expanding
<i>Black Bear</i>	G5	S5			SOW	Forested ecological systems	Subsistence species in Nulato Hills region.
<i>Brown Bear</i>	G4	S5			SOW		Subsistence species.
<i>Moose</i>	G5	S5			SOW	Arctic Mesic-Wet Willow Shrubland, Western North American Boreal Deciduous Shrub Swamp	One of the most used terrestrial mammals for subsistence, growing sport hunting in the region, charismatic species
<i>Muskox</i>	G4	S4			SOW	Arctic Shrub-Tussock Tundra, Arctic Polygonal Ground Wet Sedge Tundra	Rarely used subsistence species. Sport hunting occurs.
<i>Western Arctic Caribou</i>					SOW	Arctic Acidic Dwarf-Shrub Lichen Tundra, Arctic Shrub-Tussock Tundra, Arctic Acidic Sparse Tundra??	One of the most used terrestrial mammals for subsistence, growing sport hunting in the region.
Fishes							
Alaska Blackfish (<i>Dallia pectoralis</i>)	G5	S5	Nominee Species			Lowland stream, Major river, Lentic - deep or shallow, open basin	
Arctic lamprey (<i>Lampetra japonica</i>)	G4	S4	Nominee Species			Major river	
Pacific lamprey (<i>Lampetra tridentata</i>)	G5	S4S5	Nominee Species				
Broad whitefish (<i>Coregonus nasus</i>)	G5	S4S5	Nominee Species			Major river, Estuary and Lagoon, Lentic - shallow and deep	
Humpback whitefish (<i>Coregonus pidschian</i>)	G5	S5	Nominee Species			Major river	
Round whitefish (<i>Prosopium cylindraceum</i>)	G5	S4	Nominee Species			Major river	
Bering cisco (<i>Coregonus laurettae</i>)	G4	S4	Nominee Species			Estuary & Lagoon	
Rainbow smelt (<i>Osmerus mordax</i>)	G5	S3S5	Nominee Species			Lentic - shallow, estuary and lagoon, major river	
Arctic char (<i>Salvelinus alpinus</i>)	SNR	SNR			SOW	Lakes	
Arctic grayling (<i>Thymallus Arcticus</i>)	G5	S5			SOW	Major river	There is some sportfishing for grayling
Pink salmon (<i>Oncorhynchus gorbuscha</i>)	G5	S5			SOW	Major river	Behind marine mammals salmon are the most consumed subsistence species in the region (Pinks and Chums appear most important)
Chum salmon (<i>Oncorhynchus keta</i>)	G5	S5			SOW	Major river	Subsistence species
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	G5	S4			SOW	Major river	Subsistence species
Coho salmon (<i>Oncorhynchus kisutch</i>)	G4	S4			SOW	Major river	Subsistence species
Sockeye salmon (<i>Oncorhynchus nerka</i>)	G5	S5			SOW	Major river	Subsistence species
Dolly Varden (<i>Salvelinus malma</i>)					SOW		Subsistence species. There is some sportfishing for dolly varden

Conservation Element	Conservation Status					Associated Habitats	Notes
	Global Rank	State Rank	AK State Wildlife Action Plans	Federal Listing	BLM		
Lake trout	G5	S5			SOW	Freshwater Lakes - Deep	Not in study area, remove
Pike (<i>Esox lucius</i>)					SOW	Freshwater Lakes, Major river	There is some sportfishing for pike
Sheefish (<i>Stenodus leucichthys</i>)	G5	S3S5			SOW	Major river	There is some sportfishing for sheefish
VASCULAR PLANTS							
Artemisia globularia ssp. lutea	G4T1T2Q	S1S2			Sensitive Species	Bedrock and Talus	
Artemisia senjavinensis	G3	S2S3			Sensitive Species	Bedrock and Talus	
Cardamine microphylla ssp. blaisdellii	G4T3T4	S3S4			Watch List	Mesic-Wet Willow Shrubland	Relatively common
Carex heleonastes	G4	S2S3			Watch List	Boreal Freshwater Emergent Marsh	
Claytonia arctica	G3	S1			Sensitive Species	Acidic Sparse Tundra (?)	Wet graminoid-herbaceous tundra
Douglasia alaskana	G3	S3			Sensitive Species	Bedrock and Talus	
Douglasia beringensis	G2	S2			Sensitive Species	Bedrock and Talus	
Gentianopsis detonsa ssp. detonsa	G3G5T3T5	S1			Sensitive Species	Bedrock and Talus	
Lupinus kuschei	G3G4	S2			Watch List	Sand dunes, glacial rivers	
Oxytropis arctica var. barnebyana	G4?T2Q	S2			Sensitive Species	Bedrock and Talus, Mesic-Wet Willow Shrubland	
Oxytropis kokrinensis	G3	S3			Watch List	Acidic Dwarf-Shrub Lichen Tundra	Specifically, "Dryas meadows"
Papaver walpolei	G3	S3			Sensitive Species	Bedrock and Talus	
Parrya nauruaq	G2	S2			Sensitive Species	Bedrock and Talus	
Pedicularis hirsuta	G5?	S1			Sensitive Species	Marine Beach and Beach Meadow, Coastal Sedge-Dwarf-Shrubland	Remove species, single collection, probably not accurate identification
Pleuropogon sabinei	G4G5	S1			Sensitive Species	Slough/Pond	Remove species, single collection, probably not accurate identification
Potentilla rubricaulis	G4	S2S3			Watch List	Bedrock and Talus, Acidic Sparse Tundra	Specifically, "Alpine meadows"
Potentilla stipularis	G5	S1			Sensitive Species	Mesic-Wet Willow Shrubland	
Primula tschuktschorum	G2G3	S2S3			Sensitive Species	Wet Sedge-Sphagnum Peatland, Polygonal Ground Wet Sedge Tundra	Impacted by goose & reindeer grazing, competition with <i>P. eximia</i>
Puccinellia vahliana	G4	S2S3			Watch List	Acidic Dwarf-Shrub Lichen Tundra, Wet Sedge-Sphagnum Peatland	Specifically, "Dryas tundra, fens"
Puccinellia wrightii	G3G4	S2S3			Sensitive Species	Arctic Dwarf-Shrubland	Specifically, "Alpine Dryas"
Ranunculus auricomus	G5	S2			Watch List	Mesic-Wet Willow Shrubland	
Ranunculus chamissonis	G3G4	S2S3			Sensitive Species	Sedge-grass meadows, marshlands	
Ranunculus glacialis var. 1	G4T2	S2			Sensitive Species	Alpine scree	
Rumex krausei	G2	S2			Sensitive Species	Bedrock and Talus	
Saussurea triangulata	G1	S1			Watch List	Mesic-Wet Willow Shrubland	
Smelowskia johnsonii	G1	S1			Sensitive Species	Bedrock and Talus	
Symphyotrichum yukonense	G3	S3			Watch List	Large River Floodplain	
Taraxacum carneocoloratum	G3Q	S3			Watch List	Acidic Sparse Tundra	
Blueberry (<i>Vaccinium uliginosum</i>)	G5	SNR				Arctic Scrub Birch-Ericaceous Shrubland, Arctic Dwarf-Shrubland	Potential inclusion as one of the regions important plant subsistence food. This species occurs on most acidic tundra and woodland habitats

Conservation Element	Conservation Status					Associated Habitats	Notes
	Global Rank	State Rank	AK State Wildlife Action Plans	Federal Listing	BLM		
<i>Cloudberry/Salmonberry (Rubus chamaemorus)</i>	G5	SNR				<i>Arctic Dwarf-Shrubland, Arctic Wet Sedge-Sphagnum Peatland</i>	<i>Potential inclusion as one of the regions most important plant subsistence food</i>
<i>Crowberry/Blackberry (Empetrum nigrum)</i>	G5	SNR				<i>Arctic Scrub Birch-Ericaceous Shrubland, Arctic Acidic Dwarf-Shrub Lichen Tundra, Arctic Non-Acidic Dwarf-Shrub Lichen Tundr, Arctic Dwarf-Shrubland</i>	<i>Potential inclusion as one of the regions most important plant subsistence food</i>

Appendix IV: Candidate Change Agents for the Seward Peninsula – Nulato Hills – Kotzebue Sound Lowlands REA

Change Agent	Notes	Source	Ecological Effects	Conservation Elements Affected	Change Agent Synergies	Current	Future
CLASS I WILDFIRE							
Change in fire frequency		Higuera et al 2008, Joly et al. 2009, Kasischke et al. 2010, Hu et 2010	Alters vegetation structure and composition, alters permafrost and hydrologic regimes	Subsistence (access to and availability of fish and wildlife), all CEs	Climate Change, Invasive and Nuisance Species	X	X
Change in fire intensity		see above	see above	see above	see above	X	X
Change in fire size		see above	see above	see above	see above	X	X
CLASS II ANTHROPOGENIC ACTIVITIES							
Development							
Community infrastructure	Infrastructure includes airports, harbors, roads, fuel storage tanks, public buildings	Data from ISER infrastructure database, location, age, replacement cost	Destroying or altering habitat, creating bird collision features, introducing invasives, causing ground water pollution or changes, and creating movement barriers. Potential impacts to permafrost.	Vegetation, birds, fish, terrestrial animals	Climate change	X	X
Community expansion, relocation, or closure	Demographic change Small communities in the interior region are at risk of closing. Erosion forcing Kivalina and Shishmaref to move	Howe & Martin 2010, Survey of Living Conditions in the Arctic 2003, US Census, Alaska Department of Labor and Workforce Development	Pressure on subsistence species, damage to water supply, pollution from abandoned sites, changes to habitat where new communities are built.	Subsistence species, subsistence hunting and fishing	Climate change	X	X
Recreation							
ATVs and snow machines	Local transportation and subsistence	Survey of Living Conditions in the Arctic 2003	Increased hunting and fishing pressure, damage to tundra, pollution	subsistence species, rare plants and animals, tundra	Climate Change		X
Water based	sport hunting, eco-tourism?	Fay 2005a, 2005b, 2005c; National Park Service reports	Increased hunting and fishing pressure, pollution	subsistence species	Climate Change		X
Dispersed recreation	hiking, camping, rafting	Fay 2005a, 2005b, 2005c	Potential impacts to use areas, possibilities of fire from recreational users, pollution impacts	subsistence species, rare plants and animals, tundra	Climate Change		X
Forage							
Grazing - Teller reindeer herd		CircumArctic Rangifer Monitoring and Assessment CARMA Network, ADFG	Damage to lichen tundra, hybridization with caribou	caribou, subsistence	Climate Change	X	X
Transportation Infrastructure							
Roads, including ice roads		ISER Community databases. Larsen, et al. 2007	Habitat fragmentation, impacts to rare plant and animal populations, changes access to subsistence resources, impacts to permafrost	plants and animals, subsistence	Climate Change, Energy and mining development	X	X
Transmission corridors	There are none now. Unless we know where they will be, its premature to study this.		Habitat fragmentation, impacts to rare plant and animal populations, bird collision features	rare plants and animals, bird communities	Energy Development		X
Energy Development							
Extractive energy development							
Oil and gas	Likely to be off-shore but will affect on-shore	Minerals Management Service reports	Potential impacts to wildlife populations. Pollution and development pressures into	plant and animal communities, ecosystem services			X

Change Agent	Notes	Source	Ecological Effects	Conservation Elements Affected	Change Agent Synergies	Current	Future
			ecosystems.				
Mining	Lots of tiny exploration holes in region. 2 possible projects	Bob Loeffler interview, publications, data from AK Department of Natural Resources	Hydrological changes, access routes, pollution, providing energy to mine could impact fish and plant habitats.	ecosystem services, fish, vegetation communities	Climate Change	X	X
Alternative energy development							
Wind		ISER renewable energy database, Fay, Keith, Schwörer 2010	Destroying or altering habitat, creating bird collision features, introducing invasives, causing ground water pollution or changes, and creating movement barriers. Could increase subsistence by making fuel more affordable.	bird communities, plant and animal communities, fish	Climate Change		X
Geothermal			Potential for pollution, impacts from access to sites and fuel transport, lower energy costs may make fuel more affordable.	plants and animals communities	Climate Change		X
Mini-nukes	Galena proposed to develop	ISER energy database, Toby Schwörer	see above	see above	Climate Change		X
Biomass	Project is starting up. We can coordinate with them.	Integrative Biofuels Research: Toward Renewable Energy for Alaska (NSF funded EPSCOR project)	see above	see above	Climate Change		X
Military Constrained Areas							
Military use areas	Historic sites could be contaminated.	Army Corp of engineers. Ak land use maps.	Impacts to habitat and species	Plant and animal communities		X	X
Pollutants							
Point source pollutants	refuse management, oil spill?	EPA reports, ADFG,	Cumulation of persistent organic pollutants in subsistence species, high concentrations are known in marine mammals.	subsistence species, rare animals		X	X
Non-point source pollutants			see above	see above		X	X
Water use							
Groundwater withdrawals	Community level varies with population		Increased groundwater withdrawals may impact fish habitat and impact subsistence species. Impacts to permafrost causing potential damage to ponds.	fish, subsistence species			X
Altered surface flow connectivity (dams, alterations to habitat that make stream reaches unsuitable for species movement)		Dept of Community and Regional Affairs	Impacts to fish habitat and subsistence species.	see above	Wildfire, Climate Change		X
Altered surface flow (flood control,	river erosion? Difficult to document?		see above	see above	Wildfire, Climate Change		X

Change Agent	Notes	Source	Ecological Effects	Conservation Elements Affected	Change Agent Synergies	Current	Future
diversions, spring impoundments etc)							
CLASS IIIa NON-NATIVE SPECIES							
Invasive terrestrial plant species		AKEIC 2010, Carlson et al. 2008, Conn et al. 2008, Villano 2008, Carlson and Shepard 2007, Carlson et al. 2005	Impacts to native species and ecosystem services, competition for limited resources	All CEs	Climate Change, Anthropogenic Activities	X	X
Aquatic invasive plants	Includes the potential for the pond weed <i>Elodea canadensis</i> - Has been found in Chena Slough and Chena River near Fairbanks	Amy Larsen, NPS, in AND Dec. 1, 2010	see above	see above	see above	X	X
<i>Gambusia affinis</i> (western mosquito fish)		McClory and Gotthardt 2008	see above	see above	see above	X	X
<i>Myxobolus cerebralis</i> (the whirling disease parasite)		McClory and Gotthardt 2008	see above	see above	see above	X	X
Two invasive crayfish, <i>Procambarus clarkia</i> (Red swamp crayfish) and <i>Pacifastacus leniusculus</i> (Signal crayfish)		McClory and Gotthardt 2008	see above	see above	see above	X	X
Norway rats		McClory and Gotthardt 2008	Norway rats cause massive seabird depredation and they cause cascading impacts on coastal ecosystems in Alaska	ecosystem services, fish populations, plant and animal communities	Anthropogenic activities	X	X
Three species of introduced alder-defoliating sawflies		McClory and Gotthardt 2008	Extensive damage in areas southeast of this ecoregion and are likely to cause alterations to a dominant woody species, affecting successional pathways and wildlife if the sawflies become established.	see above	Climate Change		X
CLASS IIIb NUISANCE NATIVE SPECIES AND DISEASES							
The diatom, <i>Didymosphenia geminata</i> (Didymo, rock snot)		D. Bogan and D. Rinella, unpublished,	Aquatic ecosystems are affected at multiple trophic levels (i.e., primary and secondary productivity, competitive exclusion, predation, pathogens, indirect effects, trophic cascades, etc.).	ecosystem services, fish populations, plant and animal communities	Climate Change, Anthropogenic Activities	X	X
Disease agents (wood decay and canker fungi,		Patterson 2010	Cause significant alterations to native habitats. Impacts include changes to plant communities, wildlife, and even alters salmon spawning	see above	Climate Change	X	X

Change Agent	Notes	Source	Ecological Effects	Conservation Elements Affected	Change Agent Synergies	Current	Future
root disease, etc.)			habitats				
Native insects (aspen and willow leaf miners, spruce budworm, spruce beetle, northern engraver beetle)		Patterson 2010, Boggs et al. 2008	Cause significant alterations to native habitats. Impacts include changes to plant communities, wildlife, and even alters salmon spawning habitats	see above	Climate Change	X	X
CLASS IV CLIMATE CHANGE							
Temperature change		Hinzman et al. 2005, Kofinas et al. 2010	Temperature increases inhibit species' life cycles, alter hydrology with increased coastal river erosion, increase invasive weed expansion, alter permafrost regimes, and change disease vectors. Warmer temperatures also mean later freeze dates and earlier thaws for rivers and shorter periods of snow cover which in turn limit snow machine travel in winter, reducing access to subsistence hunting areas. Summer travel by boat or ATV is also affected by changing river levels.	All CEs		X	X
Precipitation change	SNAP future precipitation scenarios are monthly outputs of total precipitation. We can't distinguish between rain & snow, but can somewhat assume precipitation in the winter months largely falls as snow.	Hinzman et al. 2005	Precipitation changes alter hydrology, soil thermal dynamics and potential evapotranspiration. Shorter periods of snow cover limit snow machine travel in winter, reducing access to subsistence hunting areas. Summer travel by boat or ATV is also affected by changing river levels. Maybe also something here about potential effects on aquatic ecosystems?	same as above		X	X