

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

**Subsistence Resources
Study Plan Section 14.5**

Initial Study Report

Prepared for
Alaska Energy Authority



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by
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February 2014 Draft

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LIST OF ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

| Abbreviation | Definition |
|---------------------|--|
| ADF&G | Alaska Department of Fish and Game |
| ADNR | Alaska Department of Natural Resources |
| ADLWD | Alaska Department of Labor and Workforce Development |
| AEA | Alaska Energy Authority |
| ANCSA | Alaska Native Claims Settlement Act |
| ANILCA | Alaska National Interest Lands Conservation Act |
| AS | Alaska Statute |
| ATV | All Terrain Vehicle |
| BLM | Bureau of Land Management |
| BOEM | Bureau of Ocean Energy Management |
| COPD | Chronic Obstructive Pulmonary Disease |
| CRNA | Copper River Native Association |
| CSIS | Community Subsistence Information System |
| FERC | Federal Energy Regulatory Commission |
| GIS | Geographic Information System |
| GMU | Game Management Unit |
| ISR | Interim Study Report |
| MMS | Minerals Management Service |
| MSB | Matanuska-Susitna Borough |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Association |
| NPS | National Park Service |
| OSM | Office of Subsistence Management |

| Abbreviation | Definition |
|---------------------|---|
| SP | Special Publication |
| SRB&A | Stephen R. Braund and Associates |
| TAPS | Trans-Alaska Pipeline System |
| TP | Technical Paper |
| UAF | University of Alaska Fairbanks |
| UCU | Uniform Coding Unit |
| USACE | United States Army Corps of Engineers |
| USFS | United States Forest Service |
| USFWS | United States Fish and Wildlife Service |
| WAMCATS | Washington-Alaska Military Cable and Telegraph System |

EXECUTIVE SUMMARY

| Subsistence Resources Study 14.5 | |
|--------------------------------------|---|
| Purpose | The purpose of the Subsistence Resources Study is to demonstrate whether and, if so, the extent to which communities harvest and use subsistence resources within or near the Project area, use Project area lands to access other lands for subsistence harvest and use, and/or harvest and use resources that migrate through the Project area and are later harvested in other areas. |
| Status | Data collection began in January 2013 and will continue through the next study season. |
| Study Components | The study consists of the following components: <ol style="list-style-type: none"> 1) Compilation of Existing Subsistence Data 2) Household Harvest Surveys 3) Household Surveys in State-Designated Nonsubsistence Areas 4) Subsistence Mapping Interviews 5) Traditional and Local Knowledge Interviews |
| 2013 Variances | One additional community, Knik, was selected for Traditional and Local Knowledge workshops (RSP Section 14.5.4.5). |
| Steps to Complete the Study | As explained in the cover letter to this draft ISR, AEA's plan for completing this study will be included in the final ISR filed with FERC on June 3, 2014. |
| Highlighted Results and Achievements | The study team reviewed and compiled existing data for all 37 identified study communities, completed household harvest surveys in 10 study communities, and conducted a total of 28 traditional and local knowledge workshops in seven communities. Pertinent data from traditional and local knowledge workshops have been shared with the study teams for the Cultural Resources Study (Study 13.5) and Health Impact Assessment Study (Study 15.8) for follow-up. Overall, the combination of study methods and resulting data have created a comprehensive baseline of subsistence harvest and use information for the Susitna River watershed and Project area. |

1. INTRODUCTION

On December 14, 2012, Alaska Energy Authority (AEA) filed with the Federal Energy Regulatory Commission (FERC or Commission) its Revised Study Plan (RSP) for the Susitna-Watana Hydroelectric Project No. 14241 (Project), which included 58 individual study plans (AEA 2012). Included within the RSP was the Subsistence Resources Study, Section 14.5. RSP Section 14.5 was intended to provide current and representative data that will characterize the existing environment of subsistence uses in the proposed Project area.

On February 1, 2013, FERC staff issued its study plan determination (February 1 SPD) for 44 of the 58 studies, approving 31 studies as filed and 13 with modifications. RSP Section 14.5 was one of the 13 approved with modifications. In its February 1 SPD, FERC recommended the following:

The Alaska DFG clarified that its request for mapping of subsistence activities has been expanded to include the communities of Cantwell, Chase, Chitna, Gakona, Kenny Lake, McCarthy, Skwentna, Susitna, Talkeetna, and Trapper Creek in 2013, and Copperville, Glennallen, Gakona, Lake Louise, Nelchina, Mendeltna, Paxson, Tazlina, Tolsona, and Tonsina in 2014. Alaska DFG notes that changes to Table 14.5.5 should be made to reflect the additional communities where subsistence mapping would occur and where appropriate harvest surveys should be labeled “one-year mapping” to differentiate those efforts from historical mapping efforts that have been completed in the listed communities.

Alaska DFG also clarified that the list of communities where TLK interviews should be conducted has been modified and expanded from eight to twenty and includes the communities of Cantwell, Chase, Chitna, Gakona, Kenny Lake, McCarthy, Skwentna, Susitna, Talkeetna, and Trapper Creek in 2013 and Copperville, Glennallen, Gakona, Lake Louise, Nelchina, Mendeltna, Paxson, Tazlina, Tolsona, and Tonsina in 2014.

Alaska DFG suggests that RSP Table 14.5.5 Communities Selected for Traditional Knowledge, Subsistence Mapping, and Household Survey be revised to acknowledge TLK interview components of the baseline harvests surveys in the Alaska DFG identified study communities.

Alaska DFG’s recommended modifications would provide the information needed to accomplish the study objectives. Therefore, we recommend AEA implement the study with Alaska DFG’s recommended modifications.

In accordance with the February 1 SPD, AEA has adopted the FERC requested modifications.

Following the first study season, FERC’s regulations for the Integrated Licensing Process (ILP) require AEA to “prepare and file with the Commission an initial study report describing its overall progress in implementing the study plan and schedule and the data collected, including an explanation of any variance from the study plan and schedule.” (18 CFR 5.15(c)(1)) This Initial Study Report (ISR) on the Subsistence Resources Study has been prepared in accordance with FERC’s ILP regulations and details AEA’s status in implementing the study, as set forth in the

FERC-approved RSP as modified by FERC's February 1 SPD (collectively referred to herein as the "Study Plan").

2. STUDY OBJECTIVES

The study objectives are established in RSP Section 14.5.1. As described in the Study Plan, the overall goal of this study is to demonstrate whether and, if so, the extent to which communities harvest and use subsistence resources within or near the Project area, use Project area lands to access other lands for subsistence harvest and use, and/or harvest and use resources that migrate through the Project area and are later harvested in other areas.

The objectives of the Subsistence Resources Study are as follows:

1. Document whether and, if so, the extent to which communities within the Susitna River watershed, as well as communities outside the Susitna River watershed that have subsistence use areas in the watershed, use areas that are within the Project area for subsistence harvests.
2. Document whether and, if so, the extent to which communities within the Susitna River watershed, as well as communities outside the Susitna River watershed that have subsistence use areas in the watershed, use Project area lands to access other lands or waters for subsistence harvest.
3. Document whether and, if so, the extent to which communities within the Susitna River watershed, as well as communities outside the Susitna River watershed that have subsistence use areas in the watershed, use resources that migrate through the Project area and are harvested in other areas.
4. Collect and document traditional and local knowledge of communities within the Susitna River watershed, or who have subsistence use areas within the watershed, to assist in assessing the potential impacts of construction and operation of the proposed Project on subsistence harvest and use. This information will be directly shared with the program leads for other resources, as appropriate.
5. Evaluate Project development plans to identify likely sources of potential impacts on identified subsistence uses.
6. Provide the necessary information needed to support preparation of an ANILCA 810 evaluation.

Through a combination of household harvest surveys, mapping interviews, and traditional and local knowledge interviews, the Subsistence Resources Study is collecting baseline data and documenting traditional and contemporary subsistence harvest and use to facilitate the assessment of potential impacts of the Project construction and operation on subsistence harvest and use. The data developed through this study will be evaluated along with data from biological and wildlife and cultural resources studies to supplement the subsistence information and put it into context with other related resource conditions. This ISR provides the preliminary results of 2013 data compilation and field efforts.

3. STUDY AREA

As established by RSP Section 14.5.3, the study area includes the Project area, as well as locations within the Susitna River watershed where the proposed Project could affect natural resources and access conditions upstream and downstream of the Susitna River as well as its associated tributaries. The study area includes the proposed reservoir, road and transmission corridors (including a portion of one corridor adjacent to the Denali Highway that extends outside the watershed), and other Project facility sites.

As explained in the RSP (Section 14.5.3), the study team developed a list of study communities in order to adequately address potential impacts to subsistence users who use the study area for subsistence activities. This included communities that are located outside the study area but have documented use within the study area. AEA developed the following criteria for inclusion as a study community:

1. The community is located within the Susitna River watershed
2. The community is located outside of the Susitna River watershed but has previously documented subsistence use areas that extend into the watershed; or
3. The community is one of the communities preliminarily identified by ADF&G as needing updated harvest information

Based on the above criteria, AEA identified 37 study communities whose subsistence uses could potentially be affected by the proposed Project (Table 3-1).

4. METHODS AND VARIANCES IN 2013

As described in RSP Section 14.5.4, the Study Plan proposed to complete the following tasks:

1. Compilation of Existing Subsistence Data
2. Household Harvest Surveys
3. Household Surveys in State-Designated Nonsubsistence Areas
4. Subsistence Mapping Interviews
5. Traditional and Local Knowledge Interviews

In 2013, the study team implemented the methods described in the Study Plan with one variance in the traditional and local knowledge interview task (RSP Section 14.5.4.5), as described in Section 4.5.7 below.

4.1. Task 1: Compilation of Existing Data

AEA implemented the methods for compiling existing subsistence data as described in the Study Plan (RSP Section 14.5.4.1) with no variances. The study team compiled existing baseline data describing the subsistence uses of communities that may be affected by the proposed Project. Methods for the compilation of existing data as listed in the study plan consisted of the following:

- Used ADF&G’s Community Subsistence Information System (CSIS), and identified and compiled existing harvest data for the 37 communities listed in Table 3-1.
- Compiled available subsistence use area data for the 37 communities listed in Table 3-1.
- Compiled available baseline indicator data (e.g., timing of harvest activities) from available sources.
- Requested access to ADF&G’s Wildlife Harvest Ticket database. These data provide the following information:
 - Identification of subsistence users and communities in Alaska who travel to the proposed Project area to participate in land mammal harvest activities; and
 - Additional information about study communities’ (including those located in nonsubsistence areas) subsistence activities in the Project area.
- Created tables and maps describing the information compiled from the CSIS, Wildlife Harvest Ticket database, and additional sources.
- Began to incorporate results of the data review and compilation within the context of the proposed Project into subsistence reports.

In addition to compiling subsistence data, the study team compiled traditional knowledge data for incorporation into the traditional knowledge workshop summaries. For both of these efforts, the study team included the 37 study communities listed in Table 3-1.

4.1.1. Task 1: Compilation of Existing Subsistence Baseline Data

To characterize the subsistence affected environment of the study communities, this report describes the seasonal round, harvest data, and subsistence use areas for each community based on available data. This report relies primarily on existing subsistence information, including data recently collected by ADF&G for this project. ADF&G is the primary repository for these types of data for many study communities. Harvest data are primarily available through ADF&G’s CSIS (ADF&G 2013). Seasonal round, subsistence use areas, and in-depth descriptions of the data are provided in the technical papers or reports associated with each subsistence study. These reports are available online in ADF&G’s e-library. Subsistence harvest information, seasonal round data, and subsistence use area maps are also available in baseline studies conducted for Environmental Impact Statements (EISs) and federally or academically funded studies. While all residents of Alaska may qualify as subsistence users under state regulations, the majority of previous state sponsored subsistence studies have focused on those communities where a “mixed, subsistence-market” economy is the driving economic force in the community. As such, less rural areas of the state (e.g., Wasilla area) that do not rely on a mixed subsistence economy have had far fewer, if any, comprehensive subsistence studies that characterize their seasonal round, harvest data, and subsistence use areas.

Table 4.1-1. lists the 37 study communities and associated harvest data, seasonal round, and use area studies identified by the study team. In a number of cases, no harvest, seasonal round, or subsistence use area data were available for a study community. This is particularly true for communities located in a state-designated nonsubsistence area. In the past, the ADF&G Division of Subsistence has generally focused its research efforts on rural communities (i.e., those communities located outside nonsubsistence areas) and as a result there is often a lack of subsistence information for communities located in nonsubsistence areas. To address the lack of

information for certain communities and provide additional information about uses of the Project area, the study team requested access to ADF&G's Wildlife Harvest Ticket database. The ADF&G documents harvests and uses of large land mammals and furbearers by Uniform Coding Units (UCUs) within larger Game Management Units (GMUs) based on harvest tickets submitted by both resident and non-resident hunters in Alaska.

The following sections describe the methods used to identify and document the various sources of subsistence data compiled for this report including ADF&G, Federal (e.g., Minerals Management Service [MMS], U.S. Fish and Wildlife Service [USFWS], National Park Service [NPS]), and other sources.

4.1.1.1. Alaska Department of Fish and Game (State)

The study team reviewed, compiled, and categorized public data from ADF&G subsistence publications pertaining to the study communities. ADF&G subsistence publications include Technical Papers (TP), Fishery Data Series, Regional Information Reports, Technical Fishery Reports, and Special Publications (SP). For each community, the study team searched the reference section of ADF&G's CSIS (ADF&G, 2011) and the ADF&G e-library, both located on the ADF&G website, for fishing and subsistence-related literature. Within the publications searchable database, the study team conducted a keyword search of identified reports and a document content search for incidences of study community names. All search results were filtered in order to target only those documents that were related to subsistence. Sources pertaining to sport harvests, resource management, or resource monitoring were not reviewed. Documents pertaining to any of the study communities were reviewed for subsistence-related data including harvest, seasonal round, and use area data.

For each identified publication, the study team documented whether the source contained the above types of data and provided relevant notes about each source. Certain sources contained subsistence data for multiple communities, in which case a separate documentation was made for each community mentioned. The study team tallied over 100 incidences of subsistence data (i.e., harvest data, seasonal round data, or subsistence use area data for various study years) related to study communities from ADF&G sources. These subsistence data were available in 27 individual referenced sources. Other ADF&G sources had subsistence descriptions or data relevant to the study communities (e.g., harvest data specific to a single caribou herd or to a seasonal harvest activity) but did not include community-level harvest data, seasonal round data, or subsistence use areas. These sources are not reflected in Table 4.1-1. Search results identified a total of five (Copperville, Denali Highway Households, Eklutna, Wasilla, and Willow) of the 37 study communities without any ADF&G source material (see Table 4.1-1). In some cases, documents were listed as unavailable or unpublished in CSIS search results.

The study team also downloaded harvest data from the publically available CSIS database on the ADF&G website (ADF&G, 2013). This database provides harvest data collected by the ADF&G, Division of Subsistence. The data are compiled from technical papers and harvest reports and include reported and estimated harvest amounts. The website provides the data as well as the references from which the data were derived. If the CSIS cited unpublished fieldwork as the source of the harvest data, the study team cited the CSIS (ADF&G, 2013) as the default source in Table 4.1-1. The study team reviewed all available and cited documents in the ADF&G

e-library in order to identify the most accurate references for each harvest study year. The study team conducted a search of the CSIS, by community name, for all study communities included in this report; CSIS data were not available for 11 of the 37 study communities. Table 4.1-1 shows the original source of data (i.e., the technical paper associated with the study year) unless the original source is unpublished or unavailable.

The study team requested access to ADF&G's Wildlife Harvest Ticket Database but did not receive the data in time to incorporate them into the ISR. These data, if made available to the study team, will be incorporated into the Updated Study Report.

4.1.1.2. *Federal*

In order to identify federal publications that contained data pertaining to the study communities, the study team conducted a search of documents available for public access from multiple federal agencies. The federal agencies in this search include:

- National Marine Fisheries Service (NMFS) Sustainable Fisheries Division
- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Forest Service (USFS)
- Bureau of Ocean Energy Management (BOEM) (previously MMS)
- NPS
- USFWS Office of Subsistence Management (OSM)

During previous research, the study team has attempted to contact each of these agencies in order to ensure that the data available online via the agencies' webpages are current and to determine whether there are any additional repositories for the agencies' publications. The central library website for NOAA and NMFS primarily contains links to ADF&G and OSM reports available on each of the agencies' respective websites. The remaining reports either do not pertain to the study area or have restricted access and are only available to NOAA employees. The study team reviewed MMS / BOEM reports that were relevant to subsistence and reviewed the abstract of each document for information pertaining to subsistence data for the study communities. Because BOEM, NOAA, and NMFS jurisdiction is in offshore waters and lands, the majority of their subsistence-related reports address coastal communities. Therefore, few of these agencies' reports were applicable to Project area or study communities. The study team reviewed report titles and abstracts on the OSM website for information on subsistence uses and activities. The USFS website connects to the Federal Subsistence Board, which, in turn, provides access to reports through the OSM website. The NPS's Integrated Resource Management Applications Portal contained a limited set of documents relevant to subsistence within the study area.

Documents identified using these sources were reviewed for content including use areas, harvest data, seasonal round, and traditional knowledge data. From the search for relevant federal documents, the study team was able to identify two documents containing information on 16 of the study communities (Table 4.1-1.). Other Federal sources had subsistence descriptions or traditional knowledge relevant to the study communities but did not include primary community-

level harvest data, seasonal round data, or subsistence use areas. These sources are not reflected in Table 4.1-1.

4.1.1.3. *Other Non-Agency*

The study team reviewed, compiled, and categorized data from non-agency documents pertaining to the study communities and subsistence uses and activities. The study team defined “non-agency” documents as books, book chapters, journal articles, theses and dissertations, private sector reports, institutional reports, conference papers, and Alaska Native organization reports. Non-agency document searches were exclusive of state and federal reports, newspaper articles, and non-topical books and journal articles (i.e., archaeological or biological studies, sport harvest or resource management reports).

Keyword searches were conducted on a number of databases to identify, locate, and procure data sources that might contain relevant information related to the study communities. These databases include library catalogues (e.g., University of Alaska Anchorage/Alaska Pacific University Consortium Library), specific scholarly search engines (e.g., Science Direct), and internet search engines (e.g., Google Scholar). Keyword searches for non-agency documents included the study community (e.g., “Gulkana” or “Gulkana, Alaska”) as well as study community AND subsistence (e.g., “Gulkana” AND subsistence or “Gulkana, Alaska” AND subsistence). Often, the same documents were found in more than one database; for the study team, this demonstrated a thoroughness of a database search.

In several instances, documents contained information concerning more than one community. For each relevant document found, the study team conducted a document content search for incidences of individual study community names and related subsistence information. Documents pertaining to any of the study communities were reviewed for subsistence-related data including harvest, seasonal round, use area, traditional knowledge data as well as information related to the importance and sharing of subsistence resources within the community/region. The study team identified three non-agency documents which provided subsistence use areas, harvest data, or seasonal round data for 18 study communities (Table 4.1-1.). Additional non-agency documents were largely narrative accounts documenting the relationship of the study communities to the life and practice of subsistence; very few of the documents contained primary data related to subsistence use areas, harvest data, or seasonal round.

4.1.1.4. *Geographic Information System*

As part of the subsistence use area compilation, the study team reviewed all known sources of Geographic Information System (GIS) subsistence use area data that pertained to the 37 study communities. These data sources included previous ADF&G mapping studies (primarily from the 1980s), federally funded subsistence studies (e.g., Haley and Nemeth 2005), and previous projects during which Stephen R. Braund & Associates (SRB&A) conducted primary research (e.g., SRB&A 2007).

All ADF&G subsistence data shown on these maps can be located in their primary source, which is either a Technical Paper written by ADF&G or one of the Habitat Management Guides

produced by ADF&G in the 1980s and available for viewing at the ARLIS. The study team included references to these sources on each map showing ADF&G data. In some instances, both the Habitat Management Guide and a Technical Paper show the same data set. In these cases, the study team referenced both the Technical Paper and the Habitat Management Guide. In total, the study team identified 11 sources of data that contained use areas for 28 of the 37 study communities (Table 4.1-1.).

4.1.1.5. *Compilation of Traditional Knowledge Data*

During the review of state, federal, and other non-agency sources for subsistence data (see Section 4.1.1.1), the study team also identified sources of traditional knowledge for the 37 study communities. Table 4.1-2 lists the 37 study communities and the number of state, federal, public hearings, and other sources of traditional knowledge identified by the study team. Table 4.1-1 lists all of the documents identified during the traditional knowledge literature review, in addition to the communities addressed in each of these sources.

The study team identified 37 documents containing traditional knowledge pertaining to the study communities (Table 4.1-3). A majority (21) of the 37 documents came from other sources including books such as *Shem Pete's Alaska* (Kari and Fall 2003), Master's theses, and recordings of oral history collected by the University of Alaska Fairbanks (UAF). The study team identified 10 state documents all published by the ADF&G Division of Subsistence, which contained traditional knowledge for one or more of the study communities. The study team also identified five federal documents published by various agencies including the USFWS and NOAA. The SRB&A study team also identified one transcript from a public scoping meeting held in Glennallen for the Trans-Alaska Pipeline System (TAPS) Renewal Environmental Impact Statement. The study community with the highest number of traditional sources identified is Tyonek (10 sources), followed by Gulkana with eight sources. The study team was unable to identify traditional knowledge sources for 18 of the 37 study communities.

Following identification of the traditional knowledge sources, the study team reviewed each source for quotes relevant to the Project area or the Susitna River watershed and compiled these quotes for possible inclusion in the traditional knowledge workshop summaries. Quotes were later incorporated into the summaries where relevant.

4.1.2. *Variances*

No variances from the existing data compilation methods described in the Study Plan (RSP Section 14.5.4.1) were necessary in 2013.

4.2. Task 2: Household Harvest Surveys

AEA implemented the methods as described in the Study Plan for conducting household harvest surveys (RSP Section 14.5.4.2) with no variances. The ADF&G Division of Subsistence conducted household harvest surveys in 10 of the 37 study communities in 2013. Six of these communities (Cantwell, Chase, Skwentna, Susitna/Alexander Creek, Talkeetna, and Trapper Creek) were surveyed explicitly for the purposes of updating subsistence information related to the Susitna-Watana Project, while the remaining four communities (Kenny Lake, Gakona,

McCarthy, and Chitina) were Copper River area communities with harvest surveys already planned.

The harvest survey documented one year (2012) of subsistence harvest and use by households in and around the study communities. In addition, the surveys included a “one-year mapping” component that documented each study community’s subsistence use areas for the previous year and also included a key respondent traditional knowledge interview component. A detailed description of the methods used to implement the household harvest surveys will be available in ADF&G’s forthcoming TPs providing the results of these efforts.

4.2.1. Variances

No variances from the household harvest survey methods described in the Study Plan (RSP Section 14.5.4.2) were necessary in 2013.

4.3. Task 3: Household Harvest Surveys in State-Designated Nonsubsistence Areas

AEA implemented the methods as described in the Study Plan for conducting harvest surveys in state-designated nonsubsistence areas (RSP Section 14.5.4.3) with no variances. ADF&G conducted household harvest surveys in Talkeetna and Trapper Creek in 2013. Similar to surveys described in Section 4.2 above, harvest surveys documented one year (2012) of subsistence harvest and use by households in and around the study communities of Talkeetna and Trapper Creek. In addition, the surveys included a “one-year mapping” component that documented each study community’s subsistence use areas for the previous year and also included a key respondent traditional knowledge interview component. Due to the sizeable populations of Talkeetna and Trapper Creek, a random sample of households for survey was identified. A detailed description of the methods used to generate the sample and implement the household harvest surveys will be available in ADF&G’s forthcoming TP providing the results of these efforts.

4.3.1. Variances

No variances from the household harvest survey in state-designated non-subsistence area methods described in the Study Plan (RSP Section 14.5.4.3) were necessary in 2013.

4.4. Task 5: Traditional and Local Knowledge Interviews

AEA implemented the the methods as described in the Study Plan for conducting traditional and local knowledge interviews (RSP Section 14.5.4.5), with the exception of variances explained below (Section 4.5.7). The study team conducted workshops with knowledgeable residents in selected study communities to document traditional and local knowledge about the physical, biological, and social environment as it relates to the proposed Project. To select study communities for the traditional and local knowledge research, the study team considered the following criteria:

- The study community is located within the Susitna River watershed; or,

- The study community's use area is located within the Susitna River watershed; and
- At least 50 percent of the community is Alaska Native; or
- A federally recognized tribe is affiliated with the community.

Criteria were based on consideration of the likelihood that the community has knowledge about the Project area (proximity of community or use area to the Susitna River watershed), as well as consideration of the presence of long-term knowledge held by at least a portion of the community (Alaska Native population or affiliation of a federally recognized tribe). Eight communities were listed in the study plan as meeting the criteria for inclusion in the traditional and local knowledge studies. Following AEA's submittal of the study plan to FERC, the study team added Knik as a traditional knowledge study community (see Section 4.5.8, below). Thus, the updated list of communities included in the traditional and local knowledge studies is as follows:

- Cantwell
- Chickaloon
- Chitina
- Copper Center
- Eklutna
- Gakona
- Gulkana
- Knik
- Tyonek

The traditional and local knowledge studies used the following methods to document knowledge of the physical, biological, and social environment with the selected study communities:

- Coordinated with tribal governments and Alaska Native entities as appropriate to seek community support for conducting the interviews
- Consulted with program leads for other resources (e.g., cultural resources, wildlife, fish, vegetation, water quality, air quality, socioeconomics) to identify key topics and questions for the traditional and local knowledge workshops
- Developed a workshop protocol, incorporating input from program leads for other resources, that covers the following basic topics:
 - Physical Environment
 - Biological Environment
 - Social Environment, including health
 - Issues and Concerns
- Worked with coordinating organizations in each community to schedule and arrange workshops and to identify knowledgeable residents to participate in the workshops
- With two staff members present, conducted multiple traditional and local knowledge workshops in each selected community to document knowledge about the physical, biological, and social environment
- Following the workshops, identified key respondents for follow-up Traditional Cultural Property (TCP) and Health Impact Assessment (HIA) interviews by AEA;
- Conducted post-field data processing by editing notes and compiling and organizing quotes by topic and subtopic

- Reviewed findings with study communities
- Began incorporating results of the traditional and local knowledge workshops in each selected community, supplemented by respondent observations, within the context of the proposed Project into study reports

The methods used to implement the traditional knowledge workshops are discussed in greater detail in the following sections.

4.4.1. Community Approval

The study team coordinated with the tribal government in each of the selected study communities to gain community approval for the proposed workshops. The study team sent introductory letters to each tribal government to introduce the project and ask for the community's participation in the study. The study team then followed up with a phone call or email to discuss the project, answer any questions, and to discuss the possibility of obtaining a resolution from the council supporting the project. In some cases, the community indicated a resolution was not necessary to proceed with the workshops and instead provided verbal approval of the project. Several councils, including the Native Village of Tyonek, the Chickaloon Village Traditional Council, and the Knik Tribal Council, requested an introductory meeting to explain the project and discuss their community's participation.

The study team obtained resolutions (including a Coordination Agreement with the Native Village of Eklutna) from five of the nine tribal governments (Cantwell, Eklutna, Gakona, Gulkana, and Tyonek), and verbal approval from Chitina and Copper Center to conduct the workshops. At a joint council meeting, the Chickaloon Village Traditional Council and Knik Tribal Council requested the development of a Coordination Agreement prior to conducting workshops. The Coordination Agreement is pending approval from AEA and the councils. For this reason, the study team was unable to conduct workshops with Chickaloon and Knik in time for incorporation into the ISR. The study team hopes to finalize the Coordination Agreement and conduct the workshops in the next study season, the results of which will be incorporated into the Updated Study Report.

Table 4.5-1 lists the coordinating organization for each of the study communities. After arriving in the study communities, the study team met with a representative from the traditional council or other community organization to discuss the study and answer any questions.

4.4.2. Scheduling Workshops

The study team coordinated with the tribal government in each community to schedule workshops. The study team generally scheduled two to three workshops in each study community, depending on community size and instructions from the coordinating organizations (Table 4.5-1). Workshop times were chosen by the council, the coordinating organization, or by participants depending on their availability. The study team generally scheduled multiple workshops at different times of the day (e.g., in the afternoon and in the evening), to accommodate residents' differing work and personal commitments. In some communities, multiple workshops were scheduled but not all were held. In these situations, tribal council representatives, workshop participants, and/or local helpers indicated that the study team had interviewed a representative group of local residents and that participation in subsequent

workshops was not likely. As discussed above, Knik and Chickaloon workshops are pending the approval of a Coordination Agreement. Therefore, the study team successfully scheduled and conducted workshops in seven of the original nine selected study communities.

For the community of Copper Center, the study team's primary contact was the Native Village of Kluti-Kaah. However, the Copper River Native Association (CRNA) also assisted the study team in arranging workshops with area elders and other knowledgeable people. These additional workshops organized through CRNA provided opportunities for individuals who were not residents of Gulkana, Copper Center, or Chitina or who could not attend any of the already-scheduled workshops, to participate.

4.4.3. Identifying and Contacting Participants

The study team identified potential workshop participants in each community through recommendations from the coordinating organization as well as from local liaisons, workshop participants, and in some cases, non-coordinating organizations. The study team informed the council in each community that they would like to conduct workshops with knowledgeable community members, including elders, active harvesters, and long term community members, who would be able to provide information concerning their knowledge of the Susitna-Watana Project area and Susitna River watershed. The study team asked the council or other coordinating organizations in each community to encourage knowledgeable community members to participate in the scheduled workshops and provided flyers to announce the workshop times and dates. In most of the study communities, employees at the council office contacted local residents to inform them of the workshops. The study team also offered to hire local liaisons in each community to assist with contacting residents and scheduling workshops, in addition to providing translation services when necessary. When the coordinating organization indicated it was appropriate, the study team contacted potential workshop participants directly and invited them to attend.

4.4.4. Protocol Development

The study team developed a protocol to guide the traditional knowledge workshops, which were focused on gathering data relevant to identifying potential impacts and mitigation associated with the Project. A community's traditional knowledge covers a broad range of topics relevant to the physical, biological, and social environment. For the purposes of the traditional knowledge workshops for this study, the study team designed the protocol to collect traditional knowledge specifically related to the Project area and the Susitna River watershed. The purpose of redirecting the focus of the workshops from general traditional knowledge topics to knowledge of those topics as they relate to the Project was to avoid generating information that was too generalized or broad to be useful in the identification of Project impacts and mitigation.

In order to ensure that the study team covered topics useful to other resource authors, the study team requested that each resource author provide the study team with a list of relevant key topics/questions for the traditional knowledge workshop. The study team received responses from authors related to the following eight resource topics:

- Water Quality

- Wildlife and Vegetation
- Fish
- Ice
- Aesthetics
- Socioeconomics/Recreation
- Cultural Resources
- Health

Once all responses were received, the questions or topics provided by the authors were incorporated, where relevant, into the workshop protocols. The workshop protocol was divided into five sections:

- Physical environment;
- Biological environment;
- Social environment;
- Health; and
- Additional comments and concerns.

Each of these sections included questions on various traditional knowledge topics. The physical environment section of the protocol included questions on the watershed; terrestrial environment; storms, winds, and climate; ice and snow; and air quality. The biological environment section of the protocol focused on knowledge about vegetation, fish and wildlife, and wildlife habitat. The social environment section of the protocol included questions on cultural resources; subsistence; noise and views; and social and economic topics. A section on health addressed community perceptions about the health of their community; sources of health care; traditional views on health; impacts and benefits of development on health; and factors that contribute to a healthy lifestyle. For each of the topics under the physical, biological, social, and health sections, the study team included specific questions that addressed the topics requested by the resource authors. The protocol concluded with a section on additional comments or concerns related to the Project, including perceived impacts or benefits of the Project and suggestions for how potential impacts could be lessened and benefits maximized.

4.4.5. Workshop Methods

Before each workshop began, study team members explained the purpose of the traditional knowledge studies and the topics to be addressed in the workshop, and asked each participant to read and sign an informed consent form. The informed consent form guaranteed the confidentiality of each workshop participants' identity and information (unless the participant specifically requested to be identified) in all project deliverables. Study team members provided workshop participants with handouts including a map of the Project area and Susitna River watershed, as well as a map of previously documented subsistence use areas for their community vis-à-vis the watershed. The rationale for providing respondents with a map of their community's use areas is that community residents would likely have the greatest amount of knowledge about the area where they conduct subsistence activities and therefore would benefit from a map that provides a closer and more detailed view of their particular use area. The study team asked

workshop participants to review the documented traditional subsistence use areas and indicate whether these use areas appeared to accurately represent the community's uses.

The study team developed a PowerPoint presentation for each community that was based on the workshop protocol specific to that community's region and used the presentation to guide the workshops and to keep participants focused on protocol topics. Two study team members were present for each workshop. One member of the study team led the discussion with respondents, while the other member of the study team typed detailed notes of the discussion and responses of the workshop participants, using a laptop computer. The study team hired translators in communities as necessary to help communicate questions and subsequent discussions to elders, and to then translate the elders' responses to study team members.

The workshop facilitator began each section of the workshop by introducing the topic to be addressed (e.g., ice and snow conditions), and then allowing participants to provide knowledge they believed to be relevant to that topic. The study team then followed up with more specific questions and facilitated discussion among the workshop participants. While the study team tried to focus workshop participants on providing knowledge specific to the Project area or the Susitna River watershed, this was not always possible. In a number of cases, workshop participants indicated that they did not regularly use the Project area or watershed and therefore could not provide specific information about that area. In these cases, residents often provided more general information about their region; these observations, although not specific to the Project area or Susitna River watershed, often provided relevant information and drew comparisons or parallels to conditions in the watershed. On average, the traditional knowledge workshops lasted 2 or more hours. Each community participant received an honorarium for participation in the workshop.

The study team chose to conduct workshops with community members rather than individual interviews for several reasons. A workshop setting allows participants to corroborate their personal observations and traditional knowledge with other community members, and facilitates respondent recall through participant interactions. This approach also allows more residents in each community to participate in the study. The main drawback of a workshop setting, rather than individual interviews, is that sometimes a small group of respondents dominates the discussion, while other participants do not contribute as much or choose to defer to the opinions and observations of other participants. The study team encouraged the participation of all workshop participants by directly querying individuals and by asking follow-up questions (e.g., "Has anyone else observed these changes?"). In some cases the study team conducted individual interviews. This occurred when only one individual attended a scheduled workshop or when an individual was unable to attend one of the scheduled workshops but still wanted to provide their input.

4.4.6. Post Field Processing

After completing each traditional knowledge workshop, study team members edited all notes that were taken during the workshop, correcting typos and providing text in brackets for clarity of the quotes. Field notes consisted of quotes transcribed during the workshops, which the study team used in the report to illustrate the direct observations of workshop participants. The study team organized all pertinent quotes by topic and subtopic, to aid in the writing of the report. The study

team presented as many pertinent quotes as possible to adequately capture all relevant respondent observations. In some cases, the study team had multiple quotes about a given topic, but only included the quotes that provided the most detail or best articulated the views of workshop participants. Quotes were excluded if they were irrelevant to the topics addressed in this study (e.g., concerns about non-AEA development projects); if the topics or views in the quote were already addressed elsewhere in the report or in other quotes; or if the content of the quote was confusing or the intent of the respondent's statement was unclear.

4.4.7. Variances

Only one variance from the Study Plan occurred; the addition of Knik to the list of communities identified for traditional and local knowledge workshops.

The Study Plan listed eight communities for inclusion in the traditional and local knowledge studies. However, following AEA's submittal of the study plan to FERC, the study team realized that its methods for selecting study communities did not capture the Knik Tribe, a federally recognized tribe with ties to the Susitna River watershed. The original list of 37 study communities focused on census designated places (CDPs). Because the Knik Tribe is not a CDP but rather a tribal entity that is based out of the larger community of Wasilla, and because the study team based its selection of traditional knowledge communities on the 37 study communities, Knik Tribe was not listed in the study plan. During initial discussions with the Chickaloon Village Traditional Council, the council requested that Knik Tribal Council be invited to their introductory meeting. Based on the Chickaloon request and because of their ties to the Susitna River watershed, the study team determined that it was appropriate to add the Knik Tribe as a coordinating organization and to conduct traditional knowledge workshops with their tribal members.

5. RESULTS

5.1. Compilation of Existing Subsistence Data

Subsistence is a central aspect of culture and life in the Copper River and Susitna River regions, and is the cornerstone of the traditional relationship of the indigenous Ahtna and Dena'ina people with their environment. Residents rely on subsistence harvests of plant and animal resources for nutritional sustenance and cultural and social well-being. Subsistence is not only a source of food for people in the Copper River and Susitna River drainages, but the activities associated with subsistence strengthen community and family social ties; reinforce community and individual cultural identity; and provide a link between contemporary Athabascans and their ancestors. Subsistence customs and traditions encompass processing, sharing, redistribution networks, and cooperative and individual hunting, fishing, gathering, and ceremonial activities. These activities are guided by traditional knowledge based on a long standing relationship with the environment.

Both federal and state regulations define subsistence uses to include the customary and traditional uses of wild renewable resources for food, shelter, fuel, clothing, and other uses (ANILCA, Title VIII, Section 803, and Alaska Statute [AS] 16.05.940[33]). The Alaska Federation of Natives not only views subsistence as the traditional hunting, fishing, and

gathering of wild resources, but also recognizes the spiritual and cultural importance of subsistence in forming Native peoples' worldview and maintaining ties to their ancient cultures (Alaska Federation of Natives 2005). A recent U.S. Army Corps of Engineers study (USACE Forthcoming) conducted a literature review of existing subsistence definitions and a proposed definition of subsistence, which addressed the various elements and components of subsistence (economic, social, cultural, and nutritional). In part, this definition reads as follows:

Subsistence refers to a way of life in which wild renewable resources are obtained, processed, and distributed for household and communal consumption according to prescribed social and cultural systems and values....

.... The Subsistence way of life satisfies to various degrees and in various contexts, the economic, social, cultural, and nutritional needs of subsistence-based communities. (USACE Forthcoming)

As discussed above, subsistence includes economic, social, cultural, and nutritional elements, all of which are intertwined and necessary to the maintenance of subsistence as a whole. The economic element of subsistence focuses on “procurement and exchange of resources and production of those resources into goods such as food, clothing or tools in a non-market system” (USACE Forthcoming). Subsistence is part of a rural economic system called a “mixed, subsistence-market” economy, wherein families invest money into small-scale, efficient technologies to harvest wild foods (Wolfe 2000). According to Wolfe and Walker (1985), fishing and hunting for subsistence resources provide a reliable economic base for rural regions and these important activities are conducted by domestic family groups who have invested in fish wheels, gill nets, motorized skiffs, and snowmachines. Subsistence is not oriented toward sales, profits, or capital accumulation (commercial market production), but is focused toward meeting the self-limiting needs of families and small communities. Participants in this mixed economy in rural Alaska augment their subsistence production by cash employment. Cash (from commercial fishing, trapping, and/or wages from public sector employment, construction, oil and gas industry, or other services) provides the means to purchase the equipment, supplies, and gas used in subsistence activities. The combination of subsistence and commercial-wage activities provides the economic basis for the way of life so highly valued in rural communities (Wolfe and Walker 1985).

The social element of subsistence focuses on social organization, celebration and ceremonies, education, and special roles (USACE Forthcoming). Subsistence activities revolve around social networks that span across kin relationships, friendships, partnerships, and communities. These social networks organize the harvesting, processing, sharing, and consumption of subsistence resources and serve to strengthen social and family ties within a region. Individuals with special roles such as whaling captains, skin sewers, and processors are integral to subsistence as they help ensure that the community harvests adequate resources and that these resources are properly prepared, stored, preserved, and distributed throughout a community (USACE Forthcoming). The social element of subsistence also includes the transmission of knowledge between generations (i.e., education) through subsistence harvesting and processing activities, stories, and celebrations and ceremonies such as potlatches. The passing on of traditional knowledge is crucial to the maintenance and continuation of subsistence.

The cultural element of subsistence includes ethics and values, cultural identity, spirituality, language, and traditional knowledge (USACE Forthcoming). Participation in subsistence activities promotes transmission of traditional knowledge from generation to generation and serves to maintain people's connection to the physical and biological environment in addition to strengthening group and individual identity. The subsistence lifestyle encompasses cultural values such as sharing, respect for elders, respect for the environment, hard work, and humility. Certain spiritual beliefs, such as the belief that how one treats the environment and its resources affects the success of the community in subsistence hunting and harvesting pursuits, also continue to be important aspects of subsistence among people in the Copper River and Susitna River basins. Traditional knowledge is relevant to both the social and cultural elements of subsistence and includes the passing on of knowledge about the physical, biological, and social environment. Knowledge about harvest locations (including Native place names and other language education); harvesting, processing, and sharing methods; subsistence resource habitats, behavior, distribution, and movements; how to travel safely through various weather and terrain conditions; and various other topics are crucial to the success of subsistence activities.

In addition to being economically, socially, and culturally important, subsistence is a source of nutrition for residents in areas of Alaska where food prices are high and opportunities for cash employment are often limited. The nutritional element of subsistence includes the health benefits and the cultural and physical satisfaction associated with eating traditional foods (USACE Forthcoming). From a physical health perspective, subsistence food "is a source of important nutrients like protein, vitamin A, vitamin D, iron, zinc, potassium, phosphorus, selenium, and Omega-3 fatty acids" (Poppel and Kruse 2009). Subsistence foods are not associated with many of the health problems (e.g., cancer, heart disease, diabetes) that tend to be associated with more processed foods (USACE Forthcoming). Alaska Natives, especially elders, report craving subsistence foods when they are not available and indicate that non-traditional foods do not satisfy in the same way as subsistence foods. Thus, the consumption of subsistence foods contributes to the health, satisfaction, and identity of the Ahtna and Dena'ina people.

5.2. Household Harvest Surveys

The Alaska Department of Fish and Game, Division of Subsistence, completed household harvest surveys in the communities of Cantwell, Chase, Skwentna, and Susitna Station/Alexander Creek in January, February and March 2013. Table 5.2-1 identifies household participation and response rates for each community. The Alaska Department of Fish and Game will publish complete results of the household harvest surveys in their technical paper series. ADF&G also completed household harvest surveys in the communities of McCarthy, Chitina, Kenny Lake, copper Center, Gakona, Chistochina, Slana, Mentasta Lake, Mentasta Pass, Beluga and Tyonek; results from these surveys are forthcoming.

5.3. Household Harvest Surveys in Non-Subsistence Areas

The Alaska Department of Fish and Game, Division of Subsistence, completed household harvest surveys in Talkeetna and Trapper Creek in January 2013. Table 5.3-1 identifies household participation and response rates for both communities. The Alaska Department of Fish and Game will publish complete results of the household harvest surveys in non-subsistence areas in their TP series.

5.4. Traditional Knowledge Workshops

Workshop participation varied between communities depending on participant availability, community size, and community interest. Table 5.4-1 reports the number of workshops, dates of workshops, and number of community participants for each of the nine study communities. The study team conducted a total of 28 workshops in seven communities. Workshop size varied from 1 participant to 15 participants. A total of 136 participants attended the 28 traditional knowledge workshops, which were held between March 18 and October 21, 2013.

5.4.1. Susitna River Region

For the Susitna River Region, the study team held traditional knowledge workshops in Cantwell, Eklutna, and Tyonek. Three workshops were held in Cantwell on April 1 and 2, 2013 with a total of 9 participants. Three workshops were held in Eklutna on April 10, 23, and May 15, 2013 with a total of 12 participants. Ten workshops were held with Tyonek respondents, one of which was conducted in Anchorage at the Tyonek Native Corporation. Tyonek workshops occurred on June 26 and 27, 2013; September 5 and 6, 2013; and October 21, 2013 with a total of 15 participants. A total of 36 Susitna River Region residents attended these workshops and provided their knowledge and observations. These three Susitna River Region communities are located in three geographically distinct areas within the Susitna watershed. In addition, each community has their own unique socio-cultural environment in which they are situated with Eklutna located in an urban setting, Cantwell located in a more rural setting but with nearby road connections to larger urban areas, and Tyonek located in the most remote setting. For this reason, respondents often offered unique perspectives on both the physical/biological environment as well as the sociocultural environment. Observations by these three communities focused on topics/areas with which they were most familiar and had the most knowledge.

5.4.2. Copper River Region

For the Copper River Region, the study team held traditional knowledge workshops in Gakona, Gulkana, Copper Center, and Chitina. Three workshops were held in Gakona on March 18 and 19, 2013 with a total of 17 participants. Three workshops were held in Gulkana on April 15, 16, and 18, 2013 with a total of 16 participants. Five workshops were held in Copper Center on March 20 and April 16-18, 2013 with a total of 64 participants. One workshop was held in Chitina on April 19, 2013, with a total of three participants. A total of 100 Copper River Region residents attended these workshops and provided their knowledge and observations. Copper River Region communities are not located within the Susitna watershed. For this reason, respondents were sometimes unable to provide specific information on environmental conditions in Susitna watershed, particularly in the Project area, instead providing observations about areas closer to their communities. In most cases these observations, although not specific to the Project area, provided relevant information and drew comparisons or parallels to conditions in the Susitna watershed.

6. DISCUSSION

Overall, the Subsistence Resources Study is progressing as planned. As discussed in the Study Plan, traditional and local knowledge data collected during workshops has been shared with the study teams for both the Cultural Resources Study (Study 13.5) and Health Impact Assessment Study (Study 15.8), to facilitate study integration and subject specific follow-up. Furthermore, information produced in this study, including traditional and local knowledge data, as well as initial household harvest and data compilation results, can be shared among all studies, thus facilitating greater data integration among all related and applicable resource studies, as identified in the ISR interrelatedness diagram in the Study Plan.

As noted in the Data Gap Analysis (NLUR 2011), data collected for the original Project between 1979 and 1985 largely included and characterized subsistence fish and wildlife harvest and use activities within the categories of sport or commercial harvest; the investigation of subsistence use “was not a significant research component of the 1980’s studies” (NLUR 2011:17). As a result, little baseline information regarding subsistence harvest and use within and around the project area has been reported. Research being conducted for this study will provide the baseline data needed to assess Project impacts to subsistence as well as meet agency obligations under Title VIII of ANILCA and State of Alaska needs regarding subsistence resource management.

7. COMPLETING THE STUDY

[As explained in the cover letter to this draft ISR, AEA’s plan for completing this study will be included in the final ISR filed with FERC on June 3, 2014.]

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9. TABLES

Table 3-1. Study Communities

| Number | Study Community | Community in Watershed | Use Area in Watershed | ADF&G Identified Study Community |
|--------|---|------------------------|-----------------------|----------------------------------|
| 1 | Beluga | | X | |
| 2 | Cantwell | | X | X |
| 3 | Chase | X | X | X |
| 4 | Chickaloon | | X | |
| 5 | Chistochina | | | X |
| 6 | Chitina | | X | |
| 7 | Copper Center | | X | |
| 8 | Copperville | | No Data | X |
| 9 | Denali Hwy Households | X | No Data | |
| 10 | Eklutna | | X | |
| 11 | Gakona | | X | |
| 12 | Glennallen | | X | X |
| 13 | Gulkana | | X | X |
| 14 | Healy | | X | |
| 15 | Kenny Lake | | X | |
| 16 | Lake Louise | X | X | X |
| 17 | McCarthy | | X | |
| 18 | McKinley Park | | X | |
| 19 | Nelchina | | No Data | X |
| 20 | Mendeltna | X | No Data | |
| 21 | Mentasta Lake | | | X |
| 22 | Nabesna | | | X |
| 23 | Parks Hwy Households (Chulitna, Gold Creek, Hurricane/Broad Pass) | X | X | |
| 24 | Paxson | | X | X |
| 25 | Petersville | X | No Data | |
| 26 | Skwentna | X | X | X |
| 27 | Slana | | | X |
| 28 | Susitna | X | No Data | X |
| 29 | Talkeetna | X | No Data | |
| 30 | Tazlina | | No Data | X |
| 31 | Tolsona | | No Data | X |
| 32 | Tonsina | | X | X |
| 33 | Trapper Creek | X | No Data | |
| 34 | Tyonek | | X | |

| Number | Study Community | Community inWatershed | Use Area in Watershed | ADF&G Identified Study Community |
|--|------------------------|----------------------------------|----------------------------------|---|
| 35 | Wasilla ¹ | X | No Data | |
| 36 | Western Susitna Basin | | X | |
| 37 | Willow | X | No Data | |
| 1 Wasilla includes the outlying CDPs of Big Lake, Buffalo-Soapstone, Fishhook, Houston, Knik-Fairview, Meadow Lakes, Point MacKenzie, and Tanaina. | | | | |
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Table 4.1- 1. Subsistence Baseline Data by Study Community

| Community | Harvest Data by Study Year (Source) | | | | Seasonal Round ² | Use Area |
|------------------------------|---|----------------------|------------------------------|-------------------|--|--|
| | All Resources | Mammals ¹ | Fish | Birds | | |
| Beluga | 2005-06 (Stanek, Holen, and Wassillie 2007) | - | - | - | SRB&A 2007; Stanek, Holen, and Wassillie 2007 | 1983 (ADF&G 1985); 2005-06 (Stanek, Holen, and Wassillie 2007); 1987-2006 (SRB&A 2007) |
| Cantwell | 1982-83 (Stratton and Georgette 1984); 1999 (Simeone 2002) | - | - | 2000 (ADF&G 2013) | Simeone 2002 | Lifetime (Simeone 2002); 1964-1984 (Stratton and Georgette 1985) |
| Chase | 1986 (Stanek, Foster, and Fall 1988) | - | - | - | Stanek, Foster, and Fall 1988 | 1968-1986 (Stanek, Foster, and Fall 1988) |
| Chickaloon | 1982-83 (Stratton and Georgette 1984) | - | - | - | - | 1964-1984 (Stratton and Georgette 1985) |
| Chistochina | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988); 2009 (Kukkonen and Zimpelman 2012) | - | 2001 (Simeone and Kari 2005) | 2000 (ADF&G 2013) | McMillan and Cuccarese 1988; Kukkonen and Zimpelman 2012 | 1964-1984 (Stratton and Georgette 1985); 2009 (Kukkonen and Zimpelman 2012) |
| Chitina | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | 2000 (ADF&G 2013) | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Copper Center | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988); 2010 (ADF&G 2013) | - | 2001 (Simeone and Kari 2005) | 2000 (ADF&G 2013) | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985); 2001 (Haley and Nemeth 2005) |
| Copporville | - | - | 2001 (Simeone and Kari 2005) | - | - | - |
| Denali Hwy Households | - | - | - | - | - | - |
| Eklutna | - | - | - | - | - | Traditional Use Areas (SRB&A Unpublished-c) |

| Community | Harvest Data by Study Year (Source) | | | | Seasonal Round ² | Use Area |
|---------------------------------|---|----------------------|------------------------------|-------------------|-----------------------------|---|
| | All Resources | Mammals ¹ | Fish | Birds | | |
| Gakona | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985); 2001 (Haley and Nemeth 2005) |
| Glennallen | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Gulkana | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | 2000 (ADF&G 2013) | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985); 2001 (Haley and Nemeth 2005) |
| Healy | 1987 (ADF&G 2013) | - | - | - | - | Unknown (Wolfe et al. Unpublished) |
| Kenny Lake | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Lake Louise | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| McCarthy | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| McKinley Park | 1987 (ADF&G 2013) | - | - | - | - | - |
| Mendeltna | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| MentastaLake³ | 1982-83 (Stratton and Georgette 1984); 1987a, 1987b (McMillan | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |

| Community | Harvest Data by Study Year (Source) | | | | Seasonal Round ² | Use Area |
|-----------------------------|--|----------------------|------------------------------|-------|--|--|
| | All Resources | Mammals ¹ | Fish | Birds | | |
| | and Cuccarese 1988) 2010 (ADF&G 2013) | | | | | |
| Nabesna | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | - | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Nelchina | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Parks Hwy Households | 1986 (Stanek, Foster, and Fall 1988) | - | - | - | Stanek, Foster, and Fall 1988 | (1940s-1986) Stanek, Foster, and Fall 1988 |
| Paxson | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Petersville | 1985 (Fall and Foster 1987) | - | - | - | - | - |
| Skwentna | - | - | - | - | Fall, Foster, and Stanek 1983 ⁴ | 1983 (Fall, Foster, and Stanek 1983); Previous to 1983 (ADF&G 1985) |
| Slana⁵ | 1982-83 (Stratton and Georgette 1984); 1987a, 1987b, 1987c (McMillan and Cuccarese 1988); 2010 (ADF&G 2013) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Susitna | - | - | - | - | | Previous to 1983 (ADF&G 1985 ⁶) |
| Talkeetna | 1985 (Fall and Foster 1987) | - | - | - | - | - |
| Tazlina | 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | - |
| Tolsona | 1982-83 (Stratton and | - | 2001 (Simeone | - | McMillan and Cuccarese | 1964-1984 (Stratton and Georgette |

| Community | Harvest Data by Study Year (Source) | | | | Seasonal Round ² | Use Area |
|------------------------------|---|---|------------------------------|-------------------|---|---|
| | All Resources | Mammals ¹ | Fish | Birds | | |
| | Georgette 1984); (McMillan and Cuccarese 1988) | | and Kari 2005) | | 1988 | 1985) |
| Tonsina | 1982-83 (Stratton and Georgette 1984); 1987 (McMillan and Cuccarese 1988) | - | 2001 (Simeone and Kari 2005) | - | McMillan and Cuccarese 1988 | 1964-1984 (Stratton and Georgette 1985) |
| Trapper Creek | 1985 (Fall and Foster 1987) | - | - | - | - | 1985 (ADF&G 1985) |
| Tyonek | 1983 (Fall, Foster, and Stanek 1984); 2005-06 (Stanek, Holen, and Wassillie 2007) | 1996, 1997 (Wolfe and Mishler 1997, 1998); 1998 (Wolfe and Hutchinson-Scarborough 1999); 2001, 2002, 2003, 2004 (Wolfe, Fall, and Stanek 2002, 2003, 2004, 2005); 2005 (ADF&G 2013); 2007, 2008 (Wolfe, Fall, and Reidel 2009a, 2009b) | - | 2000 (Wolfe 2001) | Fall, Foster, and Stanek 1984; Foster 1982; SRB&A 2007; Stanek, Holen, and Wassillie 2007 | 1983 (Fall, Foster, and Stanek 1983); 1978-1984 (Fall, Foster, and Stanek 1984); 1987- 2006 (SRB&A 2007); 2005-2006 (Stanek, Holen, and Wassillie 2007) |
| Wasilla | - | - | - | - | - | - |
| Western Susitna Basin | 1982, 1984 (Stanek 1987) | - | - | - | - | Historic and Contemporary Trapping (Stanek 1987) |
| Willow | - | - | - | - | - | - |

Blank cells indicate no current (e.g., post-1960) systematically collected subsistence harvest, seasonal round, or use area data discovered for this community.

- 1 Mammals includes land mammals and marine mammals
- 2 Seasonal round data include general seasonal round tables and figures, data on the timing of subsistence harvests, and narrative descriptions of a community’s seasonal round. McMillan and Cuccarese 1988 contains seasonal round data for the Copper River Basin as a whole, rather than for individual communities.
- 3 Mentasta Lake also includes Mentasta Pass
- 4 Fall, Foster, and Stanek 1983 includes data for the Upper Yentna region, which includes Skwentna and surrounding areas
- 5 Slana also includes Slana Homestead North and Slana Homestead South
- 6 Use area data are Alexander Creek/Lower Susitna

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Table 4.1- 2. Number of Traditional Knowledge Sources by Community and Source Type

| Region / Community | State Sources | Federal Sources | Public Hearings | Other | Total |
|-----------------------|---------------|-----------------|-----------------|-------|-------|
| Beluga | 1 | | | 1 | 2 |
| Cantwell | 2 | | | 4 | 6 |
| Chase | | | | | 0 |
| Chickaloon | | | | | 0 |
| Chistochina | 3 | | | | 3 |
| Chitina | 2 | 1 | | 3 | 6 |
| Copper Center | 1 | 1 | | 3 | 5 |
| Copporville | | | | | 0 |
| Denali Hwy Households | | | | | 0 |
| Eklutna | 1 | 1 | | 5 | 7 |
| Gakona | 1 | | | | 1 |
| Glennallen | 2 | 2 | 1 | 1 | 6 |
| Gulkana | 2 | 2 | | 3 | 7 |
| Healy | | | | | 0 |
| Kenny Lake | 1 | 1 | | 1 | 3 |
| Knik ¹ | 1 | | | 3 | 4 |
| Lake Louise | | | | | 0 |
| McCarthy | | | | | 0 |
| McKinley Park | | | | | 0 |
| Nelchina | | | | | 0 |
| Mendeltna | | | | | 0 |
| Mentasta Lake | 3 | 1 | | | 4 |
| Nabesna | | 1 | | | 1 |
| Parks Hwy Households | | | | | 0 |
| Paxson | 1 | | | 1 | 2 |
| Petersville | | | | | 0 |
| Skwentna | | | | | 0 |
| Slana | 2 | 1 | | | 3 |
| Susitna | | | | 2 | 2 |
| Talkeetna | | | | 1 | 1 |
| Tazlina | 1 | | | 2 | 2 |
| Tolsona | | | | | 0 |
| Tonsina | 2 | | | 2 | 4 |
| Trapper Creek | | | | | 0 |
| Tyonek | 2 | 1 | | 7 | 10 |
| Wasilla | | | | | 0 |
| Western Susitna Basin | | | | | 0 |
| Willow | | | | | 0 |

1 Although it is not a CDP and is therefore not listed as a study community, the study team determined that it was appropriate to add the Knik Tribe as a coordinating organization and to conduct traditional knowledge workshops with their tribal members.

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Table 4.1- 3. Traditional Knowledge Sources by Community

| Citation | Community |
|--------------------------------------|---|
| Betts and Greiser 1985 | Cantwell |
| Brenwick 2001 | Copper Center, Tazlina |
| Buck 1998 | Chitina, Eklutna, Glennallen |
| Carter 2009 | Eklutna, Knik, Tyonek |
| Carter and Neilsen 2011 | Tyonek |
| Ecotrust 2005 | Copper River Basin |
| Eskilida 1999 | Chitina, Copper Center, Kenny Lake, Tonsina |
| Ewan 1999 | Gulkana |
| Johns and Johns 1998 | Copper Center, Gulkana, Paxson, Tonsina |
| Kari 1976 | Talkeetna |
| Kari 1978 | Susitna |
| Kari 1980 | Tyonek |
| Kari 2002 | Cantwell, Chitina, Gulkana |
| Kari 2008 | Cantwell |
| Kari and Fall 2003 | Tyonek |
| Kari and Kari 1982 | Tyonek |
| Peter and Holen 2004 | Eklutna, Knik, Tyonek |
| Simeone 2006 | Copper Center, Gulkana, Kenny Lake, Nabesna |
| Simeone and Fall 2003 | Glennallen |
| Simeone and Kari 2002 | Chitina, Glennallen, Slana |
| Simeone and Kari 2005 | Chistochina, Chitina, Copper Center, Gakona, Glennallen, Gulkana, Kenny Lake, Mentasta Lake, Paxson, Slana, Tonsina |
| Simeone and Valentine 2005 | Chitina, Glennallen, Gulkana, Mentasta Lake, Slana |
| Simeone, Valentine, and Tuttle 2007 | Chistochina, Gulkana, Mentasta Lake, Tazlina, Tonsina. |
| Simeone et al. 2010 | Copper River Basin |
| SRB&A Unpublished-a | Eklutna, Knik |
| SRB&A Unpublished-b | Eklutna |
| SRB&A 2007 | Beluga, Tyonek |
| SRB&A 2010 | Eklutna |
| SRB&A and Huntington Consulting 2011 | Tyonek |
| Stanek 1981 | Cantwell |
| Stanek, Holen, and Wassillie 2007 | Beluga, Tyonek |
| Stephan 1996 | Eklutna, Knik, Susitna, Tyonek |
| Stickwan 2005 | Tazlina |
| USDOI, BLM 2002 | Glennallen |
| Williams et al. 2005 | Cantwell |

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Table 4.5- 1. Coordinating Organizations by Study Community

| Community | Coordinating Organization |
|---------------|---|
| Cantwell | Native Village of Cantwell |
| Chickaloon | Chickaloon Village Traditional Council |
| Chitina | Chitina Village Council |
| Copper Center | Native Village of Kluti-Kaah; Copper River Native Association |
| Eklutna | Native Village of Eklutna |
| Gakona | Native Village of Gakona |
| Gulkana | Gulkana Village Council |
| Knik | Knik Tribal Council |
| Tyonek | Native Village of Tyonek; Tyonek Native Corporation |

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Table 5.2- 1. Sample Achievement, Household Harvest Surveys

| | Cantwell | Chase | Skwentna | Alexander/ Susitna |
|---|--------------|--------------|--------------|-----------------------|
| Interview goal | 83 | 18 | 35 | 13 |
| Households interviewed | 55 | 16 | 30 | 11 |
| Households failed to contact | 19 | 2 | 2 | 1 |
| Households declined to be interviewed | 9 | 0 | 3 | 1 |
| Households moved or nonresident | 34 | 0 | 1 | 0 |
| Total households attempted to interview | 98 | 16 | 34 | 12 |
| Refusal rate | 14.1% | 0.0% | 9.1% | 8.3% |
| Final estimate of permanent households | 83 | 18 | 35 | 13 |
| Percentage of total households interviewed | 66.3% | 88.9% | 85.7% | 84.6% |
| Interview weighting factor | 1.51 | 1.13 | 1.17 | 1.18 |
| Sampled population | 130 | 31 | 53 | 20 |
| Estimated population | 196 | 35 | 62 | 24 |

Source ADF&G Division of Subsistence household surveys, 2013.

Table 5.3- 1. Sample Achievement, Household Harvest Surveys in Non-Subsistence Areas

| | Talkeetna | Trapper Creek |
|---|--------------|------------------|
| Interview goal | 159 | 158 |
| Households interviewed | 102 | 69 |
| Households failed to contact | 106 | 40 |
| goalHouseholds declined to be interviewed | 29 | 27 |
| Households moved or nonresident | 35 | 93 |
| Total households attempted to interview | 166 | 189 |
| Refusal rate | 22.1% | 28.1% |
| Final estimate of permanent households | 374 | 148 |
| Percentage of total households interviewed | 27.3% | 46.6% |
| Interview weighting factor | 3.67 | 2.14 |
| Sampled population | 215 | 156 |
| Estimated population | 788 | 335 |

Source ADF&G Division of Subsistence household surveys, 2013.

Table 5.4- 1. Summary of Traditional Knowledge Workshops

| Community | Number of Workshops | Dates of Workshops | Number of Participants |
|-----------------|---------------------|--|------------------------|
| Cantwell | 3 | April 1 & 2, 2013 | 9 |
| Chickaloon | | Fieldwork Pending | |
| Chitina | 1 | April 19, 2013 | 3 |
| Copper Center | 5 | March 20, 2013; April 16-18, 2013 | 64 |
| Eklutna | 3 | April 10, 2013; April 23, 2013; May 15, 2013 | 12 |
| Gakona | 3 | March 18 & 19, 2013 | 17 |
| Gulkana | 3 | April 15-16, 2013; April 18, 2013 | 16 |
| Knik | | Fieldwork Pending | |
| Tyonek | 10 | June 26 & 27, 2013; September 5 & 6, 2013; October 21, 2013 | 15 |
| All Communities | 28 | March 18-October 21, 2013 | 136 |

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