

Literature Relevant to Subsistence in Northwest Alaska

*Prepared by James Magdanz
for the Northwest Arctic Borough
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This document reviews literature relevant to subsistence hunting, fishing, and gathering in northwest Alaska, assesses gaps in that literature, and discusses priorities for future studies of subsistence in Northwest Alaska. In federal law (16 U.S.C. §§ 3113) and state law (AS 16.05.940), “subsistence” is defined as:

The customary and traditional uses in Alaska of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption, and for the customary trade, barter or sharing for personal or family consumption.

This document and the supporting literature collection are one phase of a cooperative project conducted by the Alaska Department of Fish and Game, Division of Subsistence and the Northwest Arctic Borough, with support from the federal Coastal Impact Assistance Program (CIAP). Additional information about the project is available in a narrative description of the CIAP grant, and in a cooperative agreement adopted in January 2011 between the Borough and the Subsistence Division.

THE RESEARCH PROBLEM

Borough residents rely substantially on hunting, fishing, and gathering to provide for their sustenance. Ongoing and proposed developments in the Borough – mining, fishing, transportation – could impact natural resource systems through exploitation and habitat alteration, and impact human systems through social and economic changes. Development is intended to provide employment and income to residents of the Borough, but it may also increase competition for and disruption of subsistence resources.

The Borough has received and expects to continue to receive increasing numbers of permit applications for exploration and development activities. The Borough’s land use, zoning and permitting responsibilities require frequent reviews of available subsistence information.

Access to existing information and relevant future research are both critical to wise decision-making in implementation of land-use plans, including permitting of projects in areas used for subsistence. The lack of a repository of subsistence-related information for Northwest Alaska has made it difficult for the Borough to respond to its permitting and other responsibilities.

Purpose

Given the potential for significant change, the Borough’s permitting responsibilities, and the challenges in rapidly locating subsistence-related information, the purposes of this effort were to:

(1) review available information on subsistence uses in the Borough, (2) identify gaps in the available information and (3) assess perceived needs for subsistence information by local staff at the Borough and other government agencies. The results were intended to assist the Borough in meeting its permitting and other responsibilities and to help guide future research on subsistence uses in the Borough.

Objectives

The Borough identified the following objectives for this effort:

- Collect available articles and reports on subsistence uses in Northwest Alaska.
- Compile a full-text searchable index of the collected articles and reports.
- Compile a bibliography of the collected articles and reports.
- Circulate the bibliography to local agency staff for review.
- Meet with the Borough Planning Department to:
 - Determine which areas of the borough have the most pressure from existing uses.
 - Determine areas where new development is likely.
 - Provide information about subsistence use information needed for permit decisions.
- Conduct individual meetings with the local agency staff to:
 - Determine data gaps for subsistence uses in the region,
 - Determine agency priorities for future studies,
 - Understand the types of information useful in implementing federally-approved plans.
- Summarize agency priorities for future subsistence use studies.

Rationale

Northwest Alaska encompasses about 100,000 km² which, if it were a state, would make it the 35th largest state in the United States, about the same size as Ohio. It includes all lands and waters that drain into Kotzebue Sound and the Chukchi Sea between Cape Espenberg and Point Hope, including marine waters under both state and federal jurisdictions. The area encompasses a variety of similar, but not identical, political boundaries including:

- The Northwest Arctic Borough.
- The NANA Region (Alaska Native regional corporation).
- The *Maniilaq* Association service area (Alaska Native non-profit corporation)
- The Northwest Arctic Region (federal subsistence management area).
- The Kotzebue Area (fishing regulatory area extending south to Cape Prince of Wales).
- Game Management Unit 23 (hunting regulatory area extending north to Cape Lisburne).

A majority of the lands in Borough are federal public lands, including the entire Kobuk Valley National Park, Cape Krusenstern National Monument, Noatak National Preserve, and Selawik National Wildlife Refuge, and portions of the Bering Land Bridge National Preserve and Gates of the Arctic National Park. Lands in the Borough also belong to the State of Alaska, particularly in the upper Kobuk River drainage and on the northern Seward Peninsula. NANA Regional Corporation owns about 10% of the lands. Major rivers in the area – used for commercial and personal transportation, for subsistence and sport fishing, and for recreation – include the Noatak River, Kobuk River, Selawik River, Buckland River, Goodhope River, Kotzebue Sound, near-shore waters of the Chukchi Sea, and numerous coastal lagoons.

The Borough also includes the traditional territories of 11 *Iñupiaq* Eskimo societies (Burch Jr. 1998). During the 20th century, these societies coalesced into 11 small predominantly Native communities ranging in size from 151 people in Kobuk to 3,201 people in Kotzebue (U. S. Census Bureau 2011). These communities include Ambler, Buckland, Deering, Kiana, Kivalina, Kobuk, Kotzebue, Noatak, Noorvik, Selawik, and Shungnak. In the 2010 census, 81% of the 7,523 residents of the Borough were Alaska Native or American Indian, primarily *Iñupiaq* Eskimo (U. S. Census Bureau 2011).

Alaska Natives, including the *Iñupiaq* of Northwest Alaska, are among the very few indigenous peoples of the world who inhabit their traditional territories. In rural Alaska, Alaska Natives usually are a majority of the populations in their territories. Their territories have been largely unaffected by agriculture, industrial development, or roads. They manage their political and economic affairs through both traditional (tribal) and contemporary (borough and corporate) political structures.

Borough residents continue to rely substantially on hunting, fishing, and gathering. By many measures – social, cultural, economic, nutritional, and even emotional – subsistence harvests of wild foods make major contributions to Arctic life (Ballew et al. 2004; Goldsmith 2007; Heller and Scott 1967; Johnson et al. 2009; Kruse et al. 2008; McGrath-Hanna et al. 2003; Receveur et al. 1998; Richmond and Ross 2008). Throughout Northwest Alaska, the harvesting, processing, and distribution of local wild foods structure human relationships, while sustaining and continuing indigenous traditions (Bodenhorn 2000; Burch Jr. 1975; Langdon and Worl 1981; Magdanz et al. 2002; Magdanz et al. 2011, Wolfe et al. 2009).

Where reliable, comprehensive estimates were available—at the time of this writing, for 9 of 11 Borough communities—subsistence harvests provided approximately 500 pounds of wild food per person per year. Table 1 includes selected species currently being harvested for subsistence by residents of Northwest Alaska, as documented by comprehensive subsistence surveys (Magdanz et al. 2010, Magdanz et al. 2011). Given a regional population of about 7,000 people, the data suggested that subsistence contributed about 3.5 million pounds of natural, nutritious food to Borough residents' diets each year. Most of that food was unprocessed or processed in traditional ways. It was high in protein, low in saturated fats, and low in sugars (Innis and Kuhnlein 1987, Kuhnlein 1995, Lambden et al. 2007, Nobmann 1992, Nobmann 1997, Receveur and Kuhnlein 1998). Unfortunately, conventional economic indicators do not measure subsistence's contributions (Goldsmith 2008).

Literature Relevant to Subsistence in Northwest Alaska

TABLE 1. LIST OF SELECTED SPECIES USED FOR SUBSISTENCE IN NORTHWEST ALASKA

Common name(s)	Latin name	Iñupiaq name(s)
Fish		
Sheefish (inconnu)	<i>Stenodus leucichthys</i>	<i>Sii</i>
Broad w hitefish	<i>Coregonus nasus</i>	<i>Sigguġiaq, qausiġuk, qausriġuk, qalupiaq</i>
Humpback w hitefish	<i>Coregonus pidschian</i>	<i>Qaalġig, qaalġiq, iqalupiaq, iqalutchiaq, ikkuiyiq</i>
Chum salmon	<i>Oncorhynchus keta</i>	<i>Qalugraug, aqalugruaq, aqalukraug</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	<i>Iqalsugruuk, iqalsugruuk, tagayukpuk</i>
Coho salmon	<i>Oncorhynchus kisutch</i>	<i>Qalugraug</i>
Dolly Varden	<i>Salvelinus malma</i>	<i>Aqalukpiq, qalukpik</i>
Northern pike	<i>Esox lucius</i>	<i>Sililik</i>
Burbot	<i>Lota lota</i>	<i>Tittaliq</i>
Tomcod (saffron cod)	<i>Eluġinus gracilis</i>	<i>Uuaq</i>
Rainbow smelt	<i>Osmerus mordax</i>	<i>Ilqaugniq</i>
Pacific herring	<i>Clupea pallasii</i>	<i>Uġsrugtuuq</i>
Land mammals		
Caribou	<i>Rangifer tarandus</i>	<i>Tuttu</i>
Moose	<i>Alces alces</i>	<i>Tiniikaq</i>
Brown bear	<i>Ursus arctos</i>	<i>Akġaq</i>
Black bear	<i>Ursus americanus</i>	
Dall sheep	<i>Ovis dalli</i>	<i>Ipniaq</i>
Muskox	<i>Ovibos moschatus</i>	<i>Umiġmaq</i>
Beaver	<i>Castor canadensis</i>	<i>Paġuġtaq</i>
Wolverine	<i>Gulo gulo</i>	<i>Qapvik</i>
Wolf	<i>Canis lupus</i>	<i>Amaguq</i>
Marine mammals		
Bearded seal	<i>Erignathus barbatus</i>	<i>Ugruk</i>
Ringed seal	<i>Phoca hispida</i>	<i>Natchiq</i>
Spotted seal	<i>Phoca largha</i>	<i>Qasigġiaq</i>
Walrus	<i>Odobenus rosmarus</i>	<i>Aiviq</i>
Beluga whale	<i>Delphinapterus leucas</i>	<i>Sisauk</i>
Bowhead whale	<i>Balaena mysticetus</i>	<i>Agviq</i>
Birds		
<i>Migratory birds</i>		
White-fronted goose	<i>Anser albifrons</i>	<i>Kigiyuk</i>
Canada goose	<i>Branta canadensis</i>	<i>Iqsraġutilik</i>
Northern pintail	<i>Anas acuta</i>	<i>Ivugaq, kurugaq</i>
Mallard	<i>Anas platyrhynchos</i>	<i>Kurugasugruk, ivugasugruk</i>
American wigeon	<i>Anas americana</i>	<i>Uġġiihiq, uġġiihiq</i>
Greater scaup	<i>Aythya marila</i>	<i>Qaqġukpalik, qaqġutuuq</i>
Tundra swan	<i>Cygnus columbianus</i>	<i>Qugruk</i>
Sandhill crane	<i>Grus canadensis</i>	<i>Tatirġaq, tattirġaq</i>
<i>Resident birds</i>		
Willow ptarmigan	<i>Lagopus lagopus</i>	<i>Aqarġiq</i>
Rock ptarmigan	<i>Lagopus mutus</i>	<i>Niksaaktuniq</i>
Spruce grouse	<i>Dendragapus canadensis</i>	<i>Napaaqtum aqarġiq</i>
Plants		
Salmonberry (Cloudberry)	<i>Rubus chamaemorus</i>	<i>Aqpik</i>
Alpine blueberry	<i>Vaccinium uliginosum</i>	<i>Asiavik</i>
Cranberry (Lingonberry)	<i>Vaccinium vitis-idaea</i>	<i>Kikmiññaq</i>
Diamond-leafed willow	<i>Salix pulchra</i>	<i>Sura</i>
Sour dock	<i>Rumex arcticus</i>	<i>Qauġaq</i>
Alaskan rhubarb	<i>Polygonum alaskanum</i>	<i>Qusimmaq</i>
Stinkweed (Wormwood)	<i>Artemisia Tiliésii</i>	<i>Sarġiiq</i>
Eskimo tea (Labrador tea)	<i>Ledum palustre</i>	<i>Tilaaquiq</i>
Eskimo potato	<i>Hedysarum alpinum americanum</i>	<i>Masu</i>

Sources Armstrong 1995; Bellrose 1976; Georgette and Shiedt 2005; Hultén 1968; Jones 1983, 2006; Kessel 1989; Lentfer 2006; Mecklenburg et al. 2002; Morrow 1980; Schofield 1989.

In Alaska, both federal and state laws provide priorities for subsistence hunting and fishing over other consumptive uses, such as commercial fishing. Aboriginal hunting and fishing rights were extinguished by the Alaska Native Claims Settlement Act in 1971. Recognizing the lack of legal protection for Alaska's subsistence traditions, and mindful of the risks to subsistence posed by competing commercial and recreational uses, both the Alaska legislature and the U.S. Congress subsequently adopted laws intended to preserve opportunities for customary and traditional uses of fish and wildlife in Alaska. Under the Marine Mammal Protection Act of 1972, "coastal Alaska Natives" were granted an exemption which allowed them to continue to hunt for marine mammals for subsistence and handicrafts. Subsequently, a number of co-management organizations were formed to manage different species of marine mammals, including the Alaska Beluga Whale Commission, the Alaska Eskimo Whaling Commission, the Alaska *Nanuuq* Commission, the Eskimo Walrus Commission, and the Ice Seal Commission. In 1978, the Alaska legislature adopted a law providing a priority for subsistence over other consumptive uses of fish and game (AS 16.05.258). Under this law, the Alaska Board of Fisheries and the Alaska Board of Game manage for subsistence uses on state and private lands. Under the Alaska National Interest Lands Conservation Act (ANILCA) adopted by Congress in 1980, the Federal Subsistence Board manages for subsistence uses on federal public lands. Under migratory bird treaties adopted by Congress in 1999, subsistence hunts in Alaska were established for permanent residents of villages within subsistence harvest areas.

Thus, in addition to the Borough, a wide variety of management regimes need current subsistence information to fulfill their particular responsibilities for managing fish, game, migratory birds, marine mammals, lands, and waters in Northwest Alaska.

Virtually all the resources used for subsistence in the Borough are common property resources, and the vast majority of the lands and waters used for subsistence in the Borough are public lands and waters. Social and ecological systems (SES) that rely on common property resources (CPR) have been studied throughout the world. Selected global and local SES and CPR literature are included in the collection, and could provide insight into the management of subsistence systems in the Borough.

Limitations

Because the original literature collection was developed to support a social science research program, this literature review effort adopted a social science perspective. Some natural science literature specific to northwest Alaska already had been included in the collection, but no attempt was made to collect additional natural science studies from northwest Alaska.

The merits of any particular item in the literature derive from their applications. A scholar interested in evolutionary theory will value items differently than a planner evaluating permits for industrial development. The author's background is in natural resource management for subsistence uses. The original collection favored that application; this review is no doubt biased toward literature with at least some practical application in planning, permitting, and management.

This literature review did not include archival research, except for archived documents already retrieved by the Division of Subsistence in the course of previous research. Archives include

agency documents – such as annual subsistence reports compiled by Bureau of Indian Affairs teachers – that are never formally published. No attempt was made to locate and catalog additional archived materials, although these materials are extensive and underutilized.

Not all journals are open source, and older journal issues often are either not available to the public or available only for substantial fees. The collection included articles and reports that resided in the files of the Kotzebue Division of Subsistence office, or were currently available online from public repositories, including open-source journals. No attempt was made to purchase additional journal articles.

METHODS

This literature review relied substantially on an existing collection (the “collection”) of papers on subsistence in Northwest Alaska assembled by the Division of Subsistence since its inception in 1979. Originally stored on paper in file cabinets, this collection was becoming increasingly electronic. It was only partially indexed and was not easily available to other agencies or researchers. Some of the older, printed articles were difficult to find in libraries or on the Internet.

Recognizing a need to make the collection more widely accessible, the Borough and the Division of Subsistence signed an agreement that supported scanning paper copies of selected subsistence articles and indexing the collection with Adobe Acrobat® and Thompson-Reuters EndNote®, a bibliographic database program. It was expected that the indexed, electronic collection would contain about 500 articles relevant to the subsistence environment and economy of Northwest Alaska.

For available journal articles and government reports about subsistence hunting and fishing in Northwest Alaska, the Division collected and organized electronic copies into the collection. Existing collections with wider scope (e.g. a statewide collection of Division of Subsistence technical papers) were edited to remove entries that focused solely on topics not related to northwest Alaska. The Native Village of Kotzebue (Kotzebue IRA) provided the services of a college intern to scan paper copies of older articles, which were added to the electronic collection. Using EndNote®, the Division of Subsistence and the Kotzebue IRA intern compiled an electronic citation database of the collection. Using the Adobe Acrobat® Profession, the Division compiled a searchable Acrobat® index of the collection. The Division of Subsistence provided a copy of the collection, the Acrobat® index, and EndNote® bibliography to the Borough Planning Department, and circulated the bibliography to local agency staff for review and comment.

The resulting literature collection included approximately 1,500 titles. Using automated sorting tools in EndNote in EndNote® (“Smart Groups”), the author categorized and sorted the collection. The results are summarized in tables that appear in this report.

When the collection had been assembled and reviewed, a list of included titles and summaries of selected titles were circulated to staff in local agencies and organizations, including the Native Village of Kotzebue, the U.S. Fish and Wildlife Service, the Bureau of Land Management, and the National Park Service in August 2011. In August 2012, the author interviewed staff in local

organizations and agencies to discuss the collection, and identify gaps, and solicit recommendations for future research.

RESULTS

Results are presented in two sections. The first section categorizes and discusses the literature in the collection, highlighting articles of particular interest and discussing the nature of the problems addressed by that literature. The second section summarizes the results of interviews with personnel from local agencies and organizations, who were asked to evaluate the literature in the collection, identify gaps and offer suggestions for future research.

Literature Review

The review of the literature collection suggested that studies relevant to subsistence hunting, fishing, and gathering in northwest Alaska can be considered in five categories:

- Studies of subsistence production and distribution systems.
- Studies of subsistence resource management systems.
- Methods and theories relevant to the study of subsistence systems.
- Studies of the nutritional value or contamination of subsistence foods.
- Studies of ecological systems upon which subsistence depends.

Ecological systems (natural science) were not a focus of the collection, studies of ecological systems were underrepresented (see methods), and are not reviewed below. Some studies spanned two or three categories, and may be discussed in several categories.

Several sources could be considered foundation literature on Northwest Alaska. A reader seeking an efficient, but extensive overview of the area might start with these. In chronological order:

- *The Eskimo About Bering Strait* (Nelson 1899). Collections and observations during the author's residence in northern Alaska from 1877 through 1881. Conducted for the Smithsonian Institution, Bureau of American Ethnology.
- *Tomorrow is Growing Old: Stories of the Quakers in Alaska* (Roberts 1978). A detailed and insightful history of the introduction of Christianity and the growth of the Friends Church in northwest Alaska.
- *Ancient men of the Arctic*. (Giddings 1967). An archeologist's personal account of the prehistory of northern Alaska, with particular focus on discoveries at Cape Krusenstern.
- *Kuuvaŋmiut Subsistence: Traditional Eskimo Life in the Latter Twentieth Century* (Anderson et al. 1977). An extensive documentation of subsistence of traditional and contemporary subsistence life along the Kobuk River, written by a team of (primarily) anthropologists. Supported by the National Park Service and the Northwest Alaska Native Association.
- *Tagiumsinaaqmiit: Ocean Beach Dwellers of the Cape Krusenstern Area – Subsistence Patterns* (Uhl and Uhl 1977). An extensive documentation of subsistence of traditional and contemporary subsistence life along the coast northwest of Kotzebue, written by a couple who lived at *Sisualik*. Supported by the National Park Service.

- *The Iñupiaq Nations of Northwest Alaska* (Burch 1998). The culmination of a life's work documenting traditional life in Northwest Alaska. The authoritative source.

The remainder of this section discusses the strengths and weaknesses of the literature in each of the four categories and highlights selected noteworthy sources from the collection.

Literature on subsistence production and distribution systems

Studies of subsistence production and distribution are well represented in the literature. Some, like the foundation studies of Anderson et al (1977) and Uhl and Uhl (1977) emphasize traditional subsistence systems, including social, technological, and economic aspects, but do not quantify subsistence production. From the 1980s forward, quantification of subsistence production has been a growing part of the literature. Raleigh (1957), Burch (1985), Georgette and Loon (1993), and Magdanz et al. (2002) provide examples. Results of harvest survey research often were framed in ethnographic and historic contexts.

- *Western Alaska Salmon Investigations* (Raleigh 1958). A short government report, the earliest known estimate of subsistence harvests in Northwest Alaska, unique for its wide scope, documentation of methods, and expanded estimates of total harvests (rather than reported harvests). Produced by the U.S. Fish and Wildlife Service.
- *Subsistence Production in Kivalina, Alaska: A Twenty-Year Perspective*. (Burch Jr. 1985). A week-by-week accounting of subsistence harvests, employing local observers, covering the years 1964, 1965, 1982, and 1983. With replications in 1992 and 2007, Kivalina had the longest series of subsistence harvest estimates of any community in Alaska.
- *Subsistence Use of Fish and Wildlife in Kotzebue, a Northwest Alaska Regional Center*. (Georgette and Loon 1993). A rigorous estimate of subsistence harvests in a regional center, where estimation is made difficult by of the large number of and wide variation in households. Updated for tribal households: *Native Village of Kotzebue Harvest Survey Program 2002-2003-2004* (Whiting 2006).
- *The production and distribution of wild food in Wales and Deering, Alaska*. (Magdanz et al. 2002). An analysis of the structures of cooperative subsistence food production, as well as estimates of subsistence harvests.

As of 2012, the literature describing subsistence food production and distribution systems included comprehensive harvest estimates for 8 of 11 Northwest Arctic Borough communities. Surveys planned for the next two years in Ambler, Kobuk, and Noorvik would complete the comprehensive coverage. The earliest comprehensive survey efforts (e.g. Deering 1994) are now almost 20 years old; a more frequent (10-year?) schedule of comprehensive surveys warrants consideration.

Traditional ecological knowledge (TEK) has become a popular theme in Arctic subsistence literature. The collection includes almost 50 titles lauding TEK and/or lamenting TEK's absence from decision-making processes. Only a handful of these articles actually documented TEK. Three notable contributions of TEK from the literature of Northwest Alaska included:

- *Traditional knowledge of the ecology of beluga whales (Delphinapterus leucas) in the Eastern Chukchi and Northern Bering Seas, Alaska.* (Huntington et al. 1999)
- *Whitefish: Traditional Ecological Knowledge and Subsistence Fishing in the Kotzebue Sound Region, Alaska* (Georgette and Sheidt 2005).
- *Combining Iñupiaq and scientific knowledge: Ecology in northern Kotzebue Sound, Alaska* (Whiting et al. 2011).

Spatial dimensions of subsistence also were less well represented in the literature than subsistence harvests, although efforts to collect and publish spatial data have increased during the last decade. The most sophisticated subsistence mapping has been conducted by Stephen R. Braund and Associates; Figure 1 provides an example. Recent subsistence harvest survey reports (e.g. Magdanz et al. 2010) included maps of subsistence search areas and harvest locations. Planning for industrial development relies heavily on spatial data. As a consequence, the best maps of subsistence uses often are associated with industrial developments, such as:

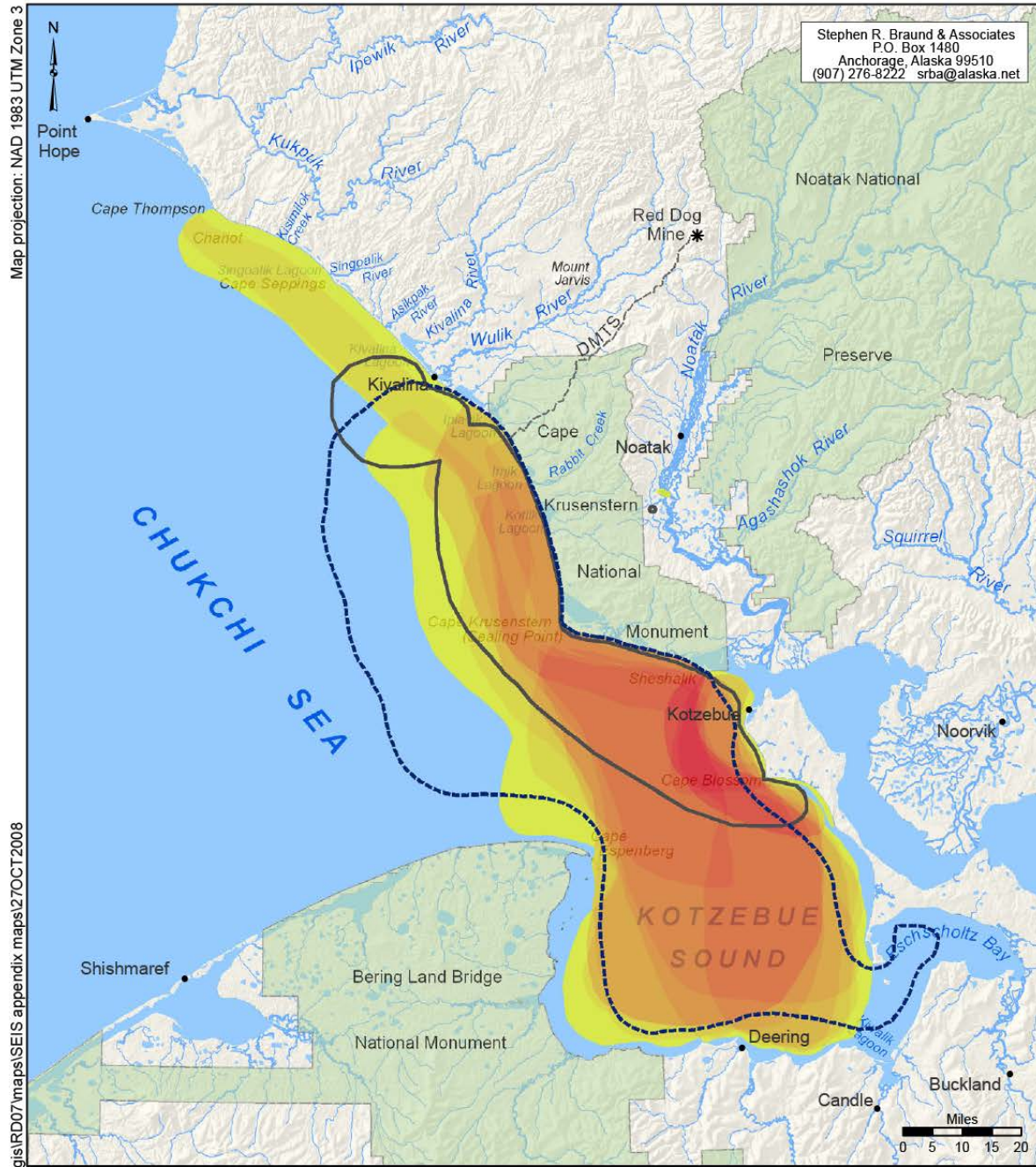
- *Red Dog Mine Extension – Aqqaluk Project Supplemental Environmental Impact Statement* (Tetra Tech 2009). An assessment of the environmental impacts of expanding the Red Dog Mine near Kivalina and Noatak.

Literature on Subsistence Management

Most recent research on subsistence production and distribution has been conducted to facilitate the implementation of state and federal subsistence priority laws adopted in 1978 and 1981. That literature, however, does not usually address the management systems themselves (Georgette and Sheidt 2005 is an exception). The literature discussed below does.

Providing for subsistence is not simply a matter of accounting for harvests and adopting (or repealing) regulations. The management system itself merits study. The collection includes items on specific regulatory issues in northwest Alaska (Georgette and Loon 1988, Magdanz et al. 2007), as well as items on best practices for management, some with global perspectives (Berkes 1991, Ostrom 2005). Examples from both ends of the scale – local and global -- include:

- *The Noatak River: fall caribou hunting and airplane use* (Georgette and Loon 1988). Documents conflicts between local subsistence and non-local aircraft supported big game hunters along the lower Noatak River. Led to a controlled use area on the Noatak River.
- *Subsistence and Self-Determination: Can Alaska Natives Have a More Effective Voice?* (Case 1989). A review of different subsistence co-management regimes in Alaska.
- *Co-management: The evolution in theory and practice of the joint administration of living resources* (Berkes et al. 1991).
- *Summary of Western Arctic Caribou Herd overlays (1984-92) and Comparison with Harvest Data from Other Sources.* (Georgette 1994). Found that formal caribou harvest reports for the Western Arctic Herd were only 11% of the estimated harvests from survey research, where survey data were available.
- *Understanding Institutional Diversity* (Ostrom 2005). Discusses frameworks that have historically been successful in managing common property resources.



Map 55: 1998-2007 and Lifetime Subsistence Use Areas Noatak, Other Seal

1998-2007 Overlapping Subsistence Use Areas

High
14 Use Areas
12 Harvesters
Other Seal

Low

For all data sets, other areas may have been used for resource harvesting.

2007 Subsistence Use Areas

4 Use Areas
4 Households
Ringed Seal

National Park Service Lands

Lifetime (circa 1925-1986) Subsistence Use Areas

25 Noatak harvesters
Seal

DeLong Mountain Transportation System (DMTS)

Sources:

1998-2007: Stephen R. Braund and Associates (SRB&A) Forthcoming.

2007: Magdanz et al. 2008.

Lifetime: Schroeder, R., D. B. Anderson (ADF&G) and G. Hildreth (Maniilaq Association) 1987.

Figure 1. Map 55 from Red Dog Mine Supplemental Environmental Impact Statement.

- *Customary trade and barter in fish in the Seward Peninsula Area, Alaska.* (Magdanz et al. 2007). Documents the “limited-non-commercial exchange” of subsistence fish for cash, known as “customary trade.” Led to regulations providing for customary trade.

Subsistence depends on common property resources (CPR), subject to conflicts among competing uses, including industrial development, commercial fishing, sport fishing and hunting, tourism, and conservation proposals that would preclude consumptive harvesting.

Authority to manage CPR resources typically does not rest with subsistence users or their representatives, or with local governments, but with state and national governments, and sometimes through arrangements with international organizations. Management of subsistence hunting and fishing has been one of the most contentious political issues in Alaska, at least since the passage of the Marine Mammal Protection Act in 1972. Since the McDowell case was decided in 1989, the state and federal governments have been battling in court over implementation of subsistence priorities, battles that have much more to do with protecting jurisdictions than with protecting subsistence opportunity itself.

Literature on Research Methods and Theories

Subsistence systems in Alaska are complex, involving a wide diversity of resources, of harvesting and processing methods, and of social and economic conditions. Documenting subsistence systems in Alaska is no less complicated than the systems themselves, requiring detailed knowledge about resources, harvesting methods, cultures, governance, and politics. No one researcher is likely to have all the necessary knowledge and skills; cooperative and interdisciplinary research methods are encouraged. Some literature in the collection addresses methods and theories relevant to subsistence research, for example:

- *The Uses of "Inaccurate" Data: A Methodological Critique and Applications of Alaska Native Data.* (McNabb 1990).
- *Observations on the Utility of the Semi-Directive Interview for Documenting Traditional Ecological Knowledge* (Huntington 1998).
- *Conservation and subsistence in small-scale societies* (Smith and Wishnie 2000). Examines arguments that indigenous and other small-scale societies were exemplary conservationists.
- *Living proof: The essential data-collection guide for indigenous use-and-occupancy map surveys* (Tobias 2010). The Bible of indigenous land use mapping methods.

Literature on Nutrition and Contaminants

Subsistence health-related studies have two aspects: nutrition and contamination. The nutrition literature documents the nutritional benefits of subsistence foods, sometimes in contrast with market foods, sometimes documenting adverse effects of non-traditional diets. The contaminants literature documents the presence (or absence) of contaminants in traditional foods.

- *The contribution of subsistence foods to the total diet of Alaska natives in 13 rural communities* (Ballew et al. 2006). Results from food frequency questionnaires describe the use of subsistence and purchased foods by residents of rural Alaska communities.

- *Nutrient intakes are associated with adherence to a traditional diet among Yup'ik Eskimos living in remote Alaska Native communities: the CANHR Study* (Bersamin et al. 2007).
- *Fugitive dust and human exposure to heavy metals around the Red Dog Mine* (Kerin and Lin 2010).
- *Organochlorine and Metal Contaminants in Traditional Foods from St. Lawrence Island, Alaska.* (Welfinger-Smith et al. 2011)

Studies of diet and nutrition are important in and of themselves, but also are necessary to evaluate risks posed by contamination of traditional foods. Risks from contamination increase with the frequency and quantity of traditional foods consumed.

Interview Results

Conversations with local agency and organization staff familiar with the region and its literature provided another dimension to the literature review. To encourage staff to speak without concern for agency agendas, they are not identified by name here. They were asked to comment on gaps in the literature that suggested needs for future research.

While all were supportive of research in the region, it was clear that they felt research should be relevant and applicable to local problems. “We are not often in a situation where we can’t address an issue because we lack information,” said one. “If you need information you don’t have, you can go to the IRA and ask.”

Monitoring Natural and Socio-Economic Systems

In one form or another, basic monitoring was mentioned by all the staff. Accelerating warming trends are expected to influence many aspects of natural systems, and create a need for formal observation of variables such as timing of green-up of vegetation, of first snowfall, and of fish and wildlife migrations. One person mentioned analyses of aerial photographs to identify specific local changes in vegetation. (Monitoring is an issue of global concern; there are several international efforts to improve monitoring of Arctic systems). One mentioned monitoring stations and local observers. “People come to meetings and say this and that, but it would be really good to have long-term evidence.”

Several supported research on natural systems dynamics along the coasts. “The coasts are where we lack basic information. If there was an oil spill, that’s ground zero,” said one. Coastal “dynamics are not well understood at all. They also fall into areas that are between the agency cracks. The land-based agencies don’t do it. NOAA is way out to sea. Lands have constituencies. Species have constituencies. But processes don’t have constituencies.”

“I don’t think Alaskans pay enough attention to migrations,” said one. “Here in Alaska, we have huge migratory caribou herds, but we don’t hear people talk about migration processes, about the dynamics of caribou migration. Build a road, and you have the potential to really impact a world-class phenomenon.”

In the subsistence arena, coastal areas have been more thoroughly documented than inland areas, partly because of Project Chariot and the Red Dog Mine port site. There was support for subsistence harvest monitoring at regular intervals, but less often than every year. “Every five years would be nice.”

Spatial Data

Because of user conflicts and development issues, spatial data (maps of subsistence use areas) were of interest. The challenges of collecting spatial data were a concern. Documenting harvest areas is only a start, said one, because it is not enough to protect harvest areas “when the spawning grounds may be a couple hundred miles away.” Another said, “We have an intuitive sense of where people go, but whether we would really support the impact of collecting (specific data), I’d have to think. It would depend on who collected it and how it was collected.”

Development Impacts and User Conflicts

Some agencies see increasing visitor use as a mandate; for example, “visitor days” are a standard metric in the National Park Service. Conflicts between consumptive and recreational users, on the one hand, and subsistence users, on the other hand, have led to a small but important local literature on user conflicts. These conflicts were expected to continue, and perhaps increase with improved access into the region. “In the future,” said one, “we expect to see applications for guided adventures, perhaps guided fishing, rafting. When it’s a commercial operation, we have to evaluate it for impacts on subsistence. I just haven’t found much literature” on such impacts.

History and Place Names

Although a number of projects have collected Inupiaq place names, the results have been published in separate articles, usually as appendices to reports on other subjects. The National Park Service and NANA Regional Corporation have made attempts to assemble a regional place names atlas, but as yet that has not been completed. “There is no place-name work for Kotzebue,” said one person. “That’s a huge gap. “What’s the Inupiaq name for Paul’s Slough, or the Little Noatak?”

“There is a lot of room for oral history in this region,” observed one person, “and while it is not about subsistence per se, that is what it is about.” Because of the aging population, opportunities for oral history are diminishing.

Traditional Ecological Knowledge

“Traditional knowledge of caribou is missing in a really big way,” said one person. “The (Western Arctic Caribou Herd) working group was really interested in having someone interview people on the fringes of the range, old stories about where caribou were and when caribou moved through. No one has really done that.” Caribou were only one possibility. Changing wildlife distributions, such as expansions of salmon, beaver, and moose were also of interest. One agency staff member commented that TEK research depended on an interest on the part of individual people in the agency: “I can’t say that it is an institutional interest.”

On the Conduct of Research

Several people commented on the difficulties of effectively conducting research in the region. “Logistics are hard.” One person commented on the disconnect between management agency research and local people. “The challenge,” he said, “is getting something that people buy into... Studies need a ‘bumper sticker’ explanation.”

Local schools might seem to be logical research partners, and indeed are all but mandated to be included in NSF-funded projects. But primary and secondary schools are focused on standard curriculums and standardized tests, creating a situation that led one local researcher with decades of experience to comment that “schools as a (research) institution are hopeless. Individual teachers can be good. In theory, schools could be significant players. But practically, schools are not. Kids these days just don’t want to do it.”

Nonetheless, staff were optimistic about the potential for local-nonlocal partnerships. “Outsiders combined with local people do the best research,” said one. “For at least some of that work, it’s easier to ask questions if you are not from the area.” The number of local young people attending universities and returning seemed to be increasing. “Having someone from here coming back and doing things can be a really strong motivator,” one said. “If people see local people doing research, they won’t feel so intimidated by the research process.”

Finally, several staff commented on the need to communicate research results. “It really confirms the value and importance of all that information in terms of cultural pride. These are not research per se, but the other part is putting the effort into getting the stuff out there so people can hear these things, find these things.”

SUMMARY AND DISCUSSION

The review of the literature collection was organized around four categories of literature, while interviews focused on gaps in the literature, future needs for information, and effective conduct of research. To summarize key points:

- Areas well represented, worthy of continued monitoring or development
 - Subsistence harvests
 - Subsistence management systems
 - Research methods and theories
 - Nutrition and contaminants
- Gaps in the literature, worthy of additional attention
 - Basic monitoring of ecological systems, especially coastal systems
 - Traditional ecological knowledge
 - Inupiaq place names, a regional synthesis
 - Oral histories
 - Subsistence land uses, where relevant and applicable

For all subjects, there needs to be improvement in science communications. Communities often complain that they never see results from research projects. In some cases, this is because researchers fail to distribute results back to communities, or they distribute results only to local

organizations. In other cases –this is more common than one might think – researchers simply fail to complete their research. And in the unique case of ANCSA 14(h)(1) research, collected and archived data have potential far beyond their original purpose (conveyance of cemetery and historic sites to Alaska Native regional corporations under the Alaska Native Claims Settlement Act).

When the collected but unpublished data have been preserved, new efforts can bring the original research to light. Three areas worthy of consideration for such “completion” research are:

- Inupiaq place names: Although a number of projects have collected place names, in particular those funded by the National Park Service and NANA Regional Corporation, an authoritative database of Inupiaq place names does not yet exist.
- Elders’ Conference oral history tapes: The physical tapes are deteriorating and the translation skills required to fully capture the nuances of meaning are diminishing.
- ANCSA 14(h)(1) Archives: Pratt (2009) is a guide to the single largest and most diverse collection of information ever collected about the history and culture of Alaska Natives.

No matter how much data are collected to fill a data gap, the gap is not filled until the results are published and distributed. Missing literature affects researchers as well as respondents, as new research may be conducted to re-collect data that were never written up or distributed.

CONCLUSION

The review of the literature collection was an attempt to assess the state of knowledge about subsistence systems in northwest Alaska, and to identify gaps in that knowledge as a guide to future research. The literature available on subsistence in Northwest Alaska has grown substantially over the past 30 years, largely as a result of research related to ANCSA, ANILCA, and the Alaska subsistence priority law. It is now possible to estimate subsistence harvests, to describe subsistence social and economic systems, and to evaluate subsistence management systems with considerable rigor and in considerable detail.

An increase in research efforts, though, increases respondent burdens. Interviews with local agency and organization staff made clear that researchers should not take respondent burdens lightly, that researchers should be well informed and well equipped before proposing new research, and researchers must publish results and return results to communities.

While subsistence is much more than simply an economy, being able to describe its economic role and functions is a major step in providing for a viable future. Changes in climate, in habitat, in resource development, in access, and in fuel prices are just a few of the factors that will impact subsistence systems in years to come. While the published literature provide a foundation for understanding and managing subsistence, continued monitoring and new research are essential.

While the literature collection was developed primarily to inform researchers, the author hopes that it will fulfill another purpose: to make the scientific literature of Northwest Alaska more readily available to the leaders and the residents of the region.

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LITERATURE CITED

- Anderson, Douglas D., Wannu W. Anderson, Ray Bane, Richard K. Nelson, and Nita Sheldon Towarak. *Kuuvaymiut Subsistence: Traditional Eskimo Life in the Latter Twentieth Century*. First Edition ed. Washington, D.C.: US Dept. of the Interior, National Park Service, 1977.
- Ballew, Carol, Angela Ross, Rebecca S. Wells, Vanessa Hiratsuka, Kari J. Hamrick, Elizabeth D. Nobmann, and Scott Bartell. "Final Report on the Alaska Traditional Diet Survey." 171: Alaska Native Health Board, Alaska Native Epidemiology Center, 2004.
- Ballew, Carol, Angela Ross Tzilkowski, Kari J. Hamrick, and Elizabeth D. Nobmann. "The Contribution of Subsistence Foods to the Total Diet of Alaska Natives in 13 Rural Communities." *Ecology of Food and Nutrition* 45, no. 1 (2006): 1-26.
- Berkes, Fikret, Peter George, and Richard J. Preston. "Co-Management: The Evolution in Theory and Practice of the Joint Administration of Living Resources." *Alternatives(Canada)* 18, no. 2 (1991): 12-18.
- Bersamin, Andrea, Sheri Zidenberg-Cherr, Judith S. Stern, and Bret R. Luick. "Nutrient Intakes Are Associated with Adherence to a Traditional Diet among Yup'ik Eskimos Living in Remote Alaska Native Communities: The Canhr Study." *International Journal of Circumpolar Health* 66, no. 1 (2007): 62.
- Bodenhorn, Barbara A. "It's Good to Know Who Your Relatives Are but We Were Taught to Share with Everybody: Shares and Sharing among Inupiaq Households." *Senri Ethnological Studies* 53 (2000): 27-60.
- Burch, Ernest S., Jr. *Eskimo Kinsmen: Changing Family Relationships in Northwest Alaska*. West Publishing, 1975.
- . *The Inupiaq Eskimo Nations of Northwest Alaska*. University of Alaska Press, 1998.
- Burch Jr., Ernest S. "Subsistence Production in Kivalina, Alaska: A Twenty-Year Perspective." Juneau, Alaska: ADF&G Division of Subsistence, 1985.
- Case, David S. "Subsistence and Self-Determination: Can Alaska Natives Have a More Effective Voice?". *U. Colo. L. Rev.* 60 (1989): 1009.
- Georgette, Susan. "Summary of Western Arctic Caribou Herd Overlays (1984-92) and Comparison with Harvest Data from Other Sources." 26. Kotzebue, Alaska: Division of Subsistence, Alaska Department of Fish and Game, 1994.
- Georgette, Susan E., and Hannah Loon. "The Noatak River: Fall Caribou Hunting and Airplane Use." Juneau, Alaska: ADF&G Division of Subsistence, 1988.
- . "Subsistence Use of Fish and Wildlife in Kotzebue, a Northwest Alaska Regional Center." Juneau, Alaska: ADF&G Division of Subsistence, 1993.
- Georgette, Susan E., and Attamuk Schiedt. "Whitefish: Traditional Ecological Knowledge and Subsistence Fishing in the Kotzebue Sound Region, Alaska." Juneau, Alaska: ADF&G Division of Subsistence, 2005.
- Giddings, J. Louis, Jr. *Ancient Men of the Arctic*. Knopf Books for Young Readers, 1967.

- Goldsmith, Scott. "The Remote Rural Economy of Alaska." 55. Anchorage: Institute of Social and Economic Research, University of Alaska, 2007.
- . *Structural Analysis of the Alaska Economy: What Are the Drivers?* Anchorage, Alaska: Institute of Social and Economic Research, University of Alaska 2008.
- Heller, Christine A., and Edward M. Scott. "The Alaska Dietary Survey: 1956-1961." 281. Anchorage, Alaska: U.S. Public Health Service, Publication No. 999-AH-2, 1967.
- Huntington, Henry P. "Observations on the Utility of the Semi-Directive Interview for Documenting Traditional Ecological Knowledge." *Arctic* 51, no. 3 (1998): 237-42.
- . "Traditional Knowledge of the Ecology of Beluga Whales (*Delphinapterus Leucas*) in the Eastern Chukchi and Northern Bering Seas, Alaska." *Arctic* 52, no. 1 (1999): 49-61.
- Innis, S. M., and H. V. Kuhnlein. "The Fatty Acid Composition of Northern-Canadian Marine and Terrestrial Mammals." [In eng]. *Acta Med Scand* 222, no. 2 (1987): 105-9.
- Johnson, Jennifer S., Elizabeth D. Nobmann, Elvin Asay, and Anne P. Lanier. "Dietary Intake of Alaska Native People in Two Regions and Implications for Health: The Alaska Native Dietary and Subsistence Food Assessment Project." *International Journal of Circumpolar Health* 68, no. 2 (2009): 109-22.
- Kerin, E. J., and H. K. Lin. "Fugitive Dust and Human Exposure to Heavy Metals around the Red Dog Mine." [In eng]. *Rev Environ Contam Toxicol* 206 (2010): 49-63.
- Kruse, Jack, Birger Poppel, Larissa Abryutina, Gerard Duhaime, Stephanie Martin, Mariekathrine Poppel, Margaret Kruse, et al. "Survey of Living Conditions in the Arctic (Slica)." Chap. 5 In *Barometers of Quality of Life around the Globe*, edited by Valerie Moller, Denis Huschka and Alex C. Michalos. Social Indicators Research Series, 107-34. Dordrecht: Springer Netherlands, 2008.
- Kuhnlein, H. V., O. Receveur, D. C. G. Muir, H. M. Chan, and R. Soueida. "Arctic Indigenous Women Consume Greater Than Acceptable Levels of Organochlorines." *Journal of Nutrition* 125, no. 10 (October 1, 1995 1995): 2501-10.
- Lambden, Jill, Olivier Receveur, and Harriet V. Kuhnlein. "Traditional Food Attributes Must Be Included in Studies of Food Security in the Canadian Arctic." [In eng]. *International Journal of Circumpolar Health* 66, no. 4 (Sep 2007): 308-19.
- Langdon, Steven J., and Rosita Worl. "Distribution and Exchange of Subsistence Resources in Alaska." Juneau, Alaska: ADF&G Division of Subsistence, 1981.
- Magdanz, James S., Nicole S. Braem, Brad C. Robbins, and David S. Koster. "Subsistence Harvests in Northwest Alaska, Kivalina and Noatak, 2007." Anchorage, Alaska: ADF&G Division of Subsistence, 2010.
- Magdanz, James S., David S. Koster, Liliana Naves, and Patricia Fox. "Subsistence Harvests in Northwest Alaska, Buckland and Kiana, 2003 and 2006." Anchorage, Alaska: ADF&G Division of Subsistence, 2011.
- Magdanz, James S., Sandra Tahbone, Austin Ahmasuk, David S. Koster, and Brian L. Davis. "Customary Trade and Barter in Fish in the Seward Peninsula Area, Alaska." Juneau, Alaska: ADF&G Division of Subsistence, 2007.
- Magdanz, James S., Charles J. Utermohle, and Robert J. Wolfe. "The Production and Distribution of Wild Food in Wales and Deering, Alaska." Juneau, Alaska: ADF&G Division of Subsistence, 2002.
- McGrath-Hanna, Nancy K., Dana M. Greene, Ronald J. Tavernier, and Abel Bult-Ito. "Diet and Mental Health in the Arctic: Is Diet an Important Risk Factor for Mental Health in

- Circumpolar Peoples?-a Review." *International Journal of Circumpolar Health* 62, no. 3 (2003): 228-41.
- McNabb, Steven L. "The Uses of "Inaccurate" Data: A Methodological Critique and Applications of Alaska Native Data." *American Anthropologist* 92, no. 1 (1990): 116-29.
- Nelson, Edward William. "The Eskimo About Bering Strait." In *Eighteenth Annual Report of the Us Bureau of American Ethnology*. 3-518. Washington, D.C.: Government Printing Office, 1899.
- Nobmann, Elizabeth D. "Nutritional Benefits of Subsistence Foods." 33. Anchorage, AK: EDN Nutrition Consulting, 1997.
- Nobmann, Elizabeth D., Tim Byers, Anne P. Lanier, Jean H. Hankin, and M. Yavonne Jackson. "The Diet of Alaska Native Adults: 1987-1988." *American Journal of Clinical Nutrition* 55, no. 5 (1992): 1024-32.
- Ostrom, Elinor. *Understanding Institutional Diversity*. Princeton University Press, 2005.
- Raleigh, Robert F. "Western Alaska Salmon Investigations, Operation Report, 1957, Reconnaissance of Salmon Fisheries between Cape Newenham and Point Hope, Alaska 1957." Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, 1958.
- Receveur, O., and H. V. Kuhnlein. "Benefits of Traditional Food in Dene/Metis Communities." [In eng]. *International Journal of Circumpolar Health* 57 Suppl 1 (1998): 219-21.
- Roberts, Arthur O. *Tomorrow Is Growing Old: Stories of the Quakers in Alaska*. Newberg, Oregon: Barclay Press, 1978.
- Smith, Eric Alden, and Mark Wishnie. "Conservation and Subsistence in Small-Scale Societies." *Annual Review of Anthropology* 29 (2000): 493-524.
- Tetra Tech, Inc. "Red Dog Mine Extension, Aqqaluk Project, Final Supplemental Environmental Impact Statement." 1,128. Seattle, Washington: US Environmental Protection Agency, 2009.
- Tobias, Terry N. *Living Proof: The Essential Data-Collection Guide for Indigenous Use-and-Occupancy Map Surveys*. Union of BC Indian Chiefs and Ecotrust Canada, 2010.
- Uhl, William R., and Carrie K. Uhl. "Tagiumsinaaqmiit: Ocean Beach Dwellers of the Cape Krusenstern Area, Subsistence Patterns." Fairbanks, AK: University of Alaska, Cooperative Park Studies Unit, 1977.
- Welfinger-Smith, Gretchen, Judith L. Minholz, Sam Byrne, Vi Waghiyi, Jesse Gologergen, Jane Kava, Morgan Apatiki, *et al.* "Organochlorine and Metal Contaminants in Traditional Foods from St. Lawrence Island, Alaska." *Journal of Toxicology & Environmental Health: Part A* 74, no. 18 (2011): 1195-214.
- Whiting, Alex. "Native Village of Kotzebue Harvest Survey Program 2002-2003-2004." 22. Kotzebue: Native Village of Kotzebue, 2006.
- Whiting, Alex, David Griffith, Stephen Jewett, Lisa Clough, William Ambrose, and Jeffrey C. Johnson. *Combining Iñupiaq and Scientific Knowledge: Ecology in Northern Kotzebue Sound, Alaska*. Fairbanks: Alaska Sea Grant College Program, 2011.
doi:10.4027/ciskenksa.2011.