

AROLIK RIVER
HUC 30502, Zone 1, Kuskokwim River Region

FINAL
INTERIM SUMMARY REPORT

Prepared by Janine Dorsey, Ph.D., Historian I

Office of History and Archaeology
Department of Natural Resources
State of Alaska

Kuskokwim Assistance Agreement
Phase II-B Submission

August 3, 2010

Office of History and Archaeology Navigable Waters Research Report No. 6

PREFACE

The research and writing of this study is funded by the U.S. Department of the Interior, Bureau of Land Management (BLM) through the Navigability Assistance Agreement (Cooperative Agreement # LO9AC15466). The State of Alaska (State) and the BLM established an assistance agreement in 2004 for the preparation of navigability reports that could be used for a variety of purposes, including the process for determining who owns title to the land under inland water bodies. Under the Statehood Compact, land under navigable waterways is reserved to the State. Navigability is based on historic use of water bodies for travel, trade and commerce up to the time of Statehood (1959), or recent use that demonstrates susceptibility to travel, trade and commerce in 1959.

The Navigability Assistance Agreement began as a pilot project focused on researching the history of use of water bodies in the Kuskokwim River region. The scope of work for the Assistance Agreement calls for identifying potentially navigable water bodies where the United States is an upland landowner or has a potential interest in the submerged lands; gathering information from BLM records and a 1985 regional history of the Kuskokwim River region; writing narrative histories of each water body summarizing land status, land conveyance decisions, past navigability determinations, physical character of the water body, and a history of use. These reports are prepared in stages. The first stage (Phase I-A) consists of land status. An interim summary report (Phase II-B) is generally limited to information in the files of the U.S. Department of Interior and a regional history of the Kuskokwim River region written by C. Michael Brown in 1985. A final summary report (Phase IV) incorporates expanded research in the files of other state and federal agency files, the holdings of various libraries and archives in Alaska, and interviews with people who have knowledge of use of the water body.

The present report represents work at the Phase II-B level. The research and writing of this report was conducted by State employees working under the guidance of an Assistance Agreement Management Team composed of representatives of BLM and the State. The management team sets priorities, reviews the reports on water bodies at various stages, and decides at what point enough research, analysis and writing has been completed on each specific water body. The management team directed the authors of these reports to refrain from drawing conclusions about the water body's navigability or susceptibility to navigability. Rather, the management team directed the authors to provide an overview at the end of the report summarizing the types of evidence of historic and contemporary use and highlighting those areas (such as portions of the water body) where gaps in knowledge remain and additional research might be warranted.

Documents that are key to understanding agency decision making or the point of view of an interested party are indicated as Attachment 1, Attachment 2, etc., which appear after the corresponding endnotes. These documents are listed in the Table of Attachments and can be viewed in their entirety in a separate PDF file that supplements this report. For other completed Navigable Waters Research Reports, see the Alaska Department of Natural Resources website: <http://dnr.state.ak.us/mlw/nav/naar/>

Table of Contents

Preface.....	i
Table of Contents	ii
Table of Figures.....	ii
Table of Tables	iii
Attachments	iii
I. Introduction.....	1
II. Land Status.....	3
III. BLM Navigability Determinations	8
IV. Physical Character of Waterway.....	19
V. Evidence of Use of Waterway	29
<i>Early Native Use of the Arolik River</i>	<i>29</i>
<i>Non-Native Use Prior to Statehood.....</i>	<i>33</i>
<i>Native Use of the Arolik River Just Prior to Statehood.....</i>	<i>41</i>
<i>Recent Use of the Arolik River Documented in Native Allotment Files</i>	<i>42</i>
<i>Recent Native Use Documented in Subsistence Studies and Other Sources</i>	<i>49</i>
<i>Government Studies of the Arolik River</i>	<i>53</i>
<i>Commercial Travel on the Arolik River since Statehood</i>	<i>56</i>
<i>Recreational and Commercial Rafting on the Arolik River</i>	<i>59</i>
VI. Summary.....	62
Endnotes.....	65

Table of Figures

Figure 1. Map showing the location of the Arolik River within Zone 1 of HUC 30502 in the Kuskokwim River Region.....	1
Figure 2. Map of the lower portion of the Arolik River, showing the location of village and corporation selected lands and Native allotments.....	6
Figure 3. Map of the upper portion of the Arolik River, showing the location of village and corporation selected lands, Native allotments, and state and federal lands.....	7
Figure 4. State Water Delineation Map depicting the South and North mouths of the Arolik river as navigable.....	11
Figure 5. Map of the portion of the Arolik River determined non-navigable by BLM.....	18
Figure 6. View of Arolik Lake looking toward the northwest, June 2008. The outlet is on the far side of the lake.....	20
Figure 7. The confluence of the East Fork (center) and the South Fork (left) of the Arolik River, June 2008. The view is looking toward the west	21
Figure 8. The Arolik River in Native allotment AA-37771 (river mile 29), July 23, 1984. The view is looking southeasterly. The black circle in the photo indicates the presence of a BLM survey marker.....	22

Figure 9.	The Arolik River at Native allotment AA-54954-C (river mile 2), August 27, 1999. The view is looking northeast	24
Figure 10.	Aerial photo of the Arolik River just southeast of Snow Gulch, 1953	26
Figure 11.	Aerial photo of the Arolik River just southeast of Snow Gulch, 1957	27
Figure 12.	Aerial photo of the Arolik River just southeast of Snow Gulch, 1982	28
Figure 13.	Looking down the main stem of the Arolik River toward Snow Gulch, June 2008. The view is looking northwest. Note the tailing piles along Snow Gulch at the upper right.....	29
Figure 14.	USGS map from 1919 showing the Arolik River, including the North and South mouths	31
Figure 15.	Sketch Map of Goodnews-Arolik Gold Field, Bethel Mining Precinct, Alaska 1931	36
Figure 16.	Frank V. Smith’s drilling crew at work next to the Arolik River near the mouth of Fox Creek, July 1931	37
Figure 17.	Frank V. Smith’s camp on the Arolik River near the mouth of Fox Creek, July 1931. A flat bottom boat is lying upside down next to the Arolik River	38

Table of Tables

Table 1.	Arolik River Navigability Determinations.....	17
-----------------	---	----

Attachments (in PDF format)

- Attachment 1.** Stanley H. Bronczyk, Realty Specialist, Memorandum on Easement Task Force Meeting on Quinhagak, February 1, 1977, BLM files, F-14885-EE.
- Attachment 2.** Robert O. Pickering, Memorandum on Navigable Waters within Village Selections, March 10, 1977, BLM files, 9185.5 (922).
- Attachment 3.** Curtis McVee, BLM State Director (SD), Memorandum on Final Easements for the Village of Quinhagak, October 25, 1979, BLM files, F-14885-EE.
- Attachment 4.** Sue A. Wolf, Chief of BLM Branch of Adjudication, Decision on Section 14(h)(1) Applications Rejected in Entirety, Lands Proper for Village Selection Approved for Interim Conveyance or Patent, November 15, 1979, BLM files, F-14885-A.
- Attachment 5.** Robert D. Arnold, Assistant to the State Director, ANCSA, Interim Conveyances Nos. 342 and 343, June 25, 1980, BLM files, F-14885-A.
- Attachment 6.** U.S. Survey No. 9688, Officially Filed August 13, 1990, Lots 2 and 3 represent Native allotment AA 031275C, Certification 50-91-0293.

- Attachment 7.** David Rukke, Realty Specialist, Interviews for Group Survey No. 171, Quinhagak Village (Window 1562), December 19, 1986, BLM files, F-14885-EE.
- Attachment 8.** Susan Di Prete, Natural Resource Specialist, Interviews for Group Survey 171 (Quinhagak), January 27, 1988, BLM files, F-14885-EE.
- Attachment 9.** Robert W. Arndorfer, Deputy State Director for Conveyance Management (960), Memorandum on Navigable Waters in Group Survey 171 (Window 1562), March 29, 1988, BLM files, F-14885.
- Attachment 10.** Sandra Dunn, Assistant District Manager, Lands, Final Easement Recommendations for Lands to be Conveyed to Calista Corporation, December 1, 1993. BLM files, AA-70153-EE.
- Attachment 11.** Robert Lloyd, Assistant District Manager, Lands Division (041), Final Easement Review and Patent Easement Memorandum for Selected Lands and Lands Conveyed by Interim Conveyance Nos. 342 and 978, to Qanirtuuq Incorporated, July 7, 1994, BLM files, F-14885-EE.
- Attachment 12.** Heather A. Coats, Land Law Examiner, Intent to Issue Patent Notice, April 6, 1995, BLM files, F-14885-EE.
- Attachment 13.** Katherine L Flippen, Acting Chief, Branch of Southwest Adjudication, Patent Nos. 50-95-0284 and 50-95-0285, June 20, 1995; Corrected Patent Nos. 50-2006-0296 and 50-2006-0297, June 16, 2006, BLM files, FF-14885-A.
- Attachment 14.** Master Title Plats (MTPs), supplements, and U.S. Rectangular Survey (USRS) and U.S. Survey (USS) plats.
- Attachment 15.** Three (3) historical MTPs of the South Mouth of the Arolik River, 1980 and 1994.
- Attachment 16.** Allyson Johnson and Linda L. Suttles, Land Law Examiners, Memorandum on Request for Navigability Recommendations, April 15, 1993, BLM files, AA-70153.
- Attachment 17.** Heather A. Coats, Land Law Examiner, Decision to Convey Lands, December 13, 1995, BLM files, AA-70147.
- Attachment 18.** Terry R. Hassett, Chief, Branch of Gulf Rim Adjudication, Interim Conveyance No. 1660, January 26, 1996, BLM files, AA-70147.
- Attachment 19.** Letter from Robert Lloyd, Chief, Land Transfer Adjudication 1, to Calista Corporation, January 23, 2008, enclosing Patent No. 50-2008-0134 issued to Calista Corporation, January 23, 2008, BLM files, A-70153.
- Attachment 20.** Denny Benson, Easement Coordinator, Notice of Proposed Easement Recommendations, September 28, 2005, BLM files, F-14885-A.
- Attachment 21.** Anne Laura Wood, Land Law Examiner, Decision to Approve Lands for Future Conveyance, January 6, 2006, BLM files, AA-76435; Proposed Tentative Approval for lands selected by the State, BLM files, AA-76435; TA transmittal letter from Richard Thwaites to the State of Alaska, January 27, 2006, with enclosed Tentative Approval, BLM files, AA-76435.

- Attachment 22.** K.J. Mushovic, Easement Coordinator, Final Easement Review and Patent Easement Memorandum for Lands to be Patented to Qanirtuuq, Inc. on behalf of the village of Quinhagak and to the Calista Corporation, March 30, 2006, BLM files, F-14885-EE.
- Attachment 23.** Dominica VanKoten, Chief, Navigability Section, Memorandum on Navigable Waters within ANCSA-Selected and Interim-Conveyed lands in the Quinhagak Village Project Area, May 18, 2006, BLM files, F-14885-A.
- Attachment 24.** Michael L. Menge, Commissioner, Alaska Department of Natural Resources, to Henri Bisson, BLM State Director, and Julia Dougan, Acting BLM State Director, regarding BLM Administrative Finality Policy, August 21, 2006, Alaska Department of Natural Resources (ADNR)/Division of Mining, Land, and Water (ML&W)/Public Access Assertion & Defense Unit (PAAD Unit), Arolik River file.
- Attachment 25.** Richard Mylius, Acting Director, Division of Mining, Land and Water, Letter to Dominica VanKoten, Bureau of Land Management, Division of Cadastral Surveys, September 11, 2006, BLM files, F-14885-EE.
- Attachment 26.** Julia Dougan, Associate State Director, Letter to Michael Menge, ADNR, November 7, 2006, ADNR/MLW/PAAD Unit, Arolik River file.
- Attachment 27.** Dominica VanKoten, Chief, Navigability Section, Letter to Richard Mylius, Acting Director, Division of Mining, Land and Water. November 9, 2006, BLM files, 9600 (927).
- Attachment 28.** Mark D. Rutherford, Waterbody Use and Observation Questionnaire, Alaska Department of Fish and Game, Anchorage, February 16, 2007, ADNR/ML&W/PAAD Unit, Arolik River file.
- Attachment 29.** Carl L. Williams, Waterbody Use and Observation Questionnaire, Alaska Department of Fish and Game, Anchorage, October 10, 1996, ADNR/ML&W/PAAD Unit, Arolik River file.
- Attachment 30.** Ed Swanson, President, Knik Kanoers & Kayakers, Anchorage, to Dick Thompson, BLM, Anchorage, September 18, 1975, ADNR/ML&W/PAAD Unit, Arolik River file.
- Attachment 31.** Interview with Chris Goll, August 26, 1985, conducted by Dale Stirling, ADNR/ML&W/PAAD Unit, Arolik River file.
- Attachment 32.** Glenn Paul Martin, Waterbody Use and Observation Questionnaire, Alaska Department of Fish and Game, Anchorage, October 20, 1995, ADNR/ML&W/PAAD Unit, Arolik River file.

AROLIK RIVER (HUC 30502, Zone 1, Kuskokwim River Region) II-B Interim Summary Report

I. Introduction

The Arolik River system is located in the Yukon-Kuskokwim Delta Region, within Zone 1 of HUC 30502 (Figure 1). The river originates in the Ahklun Mountains and drains a watershed of 573 square miles before emptying into Kuskokwim Bay.¹ Throughout most of its 50-mile length, the Arolik River system flows gently to the sea.²

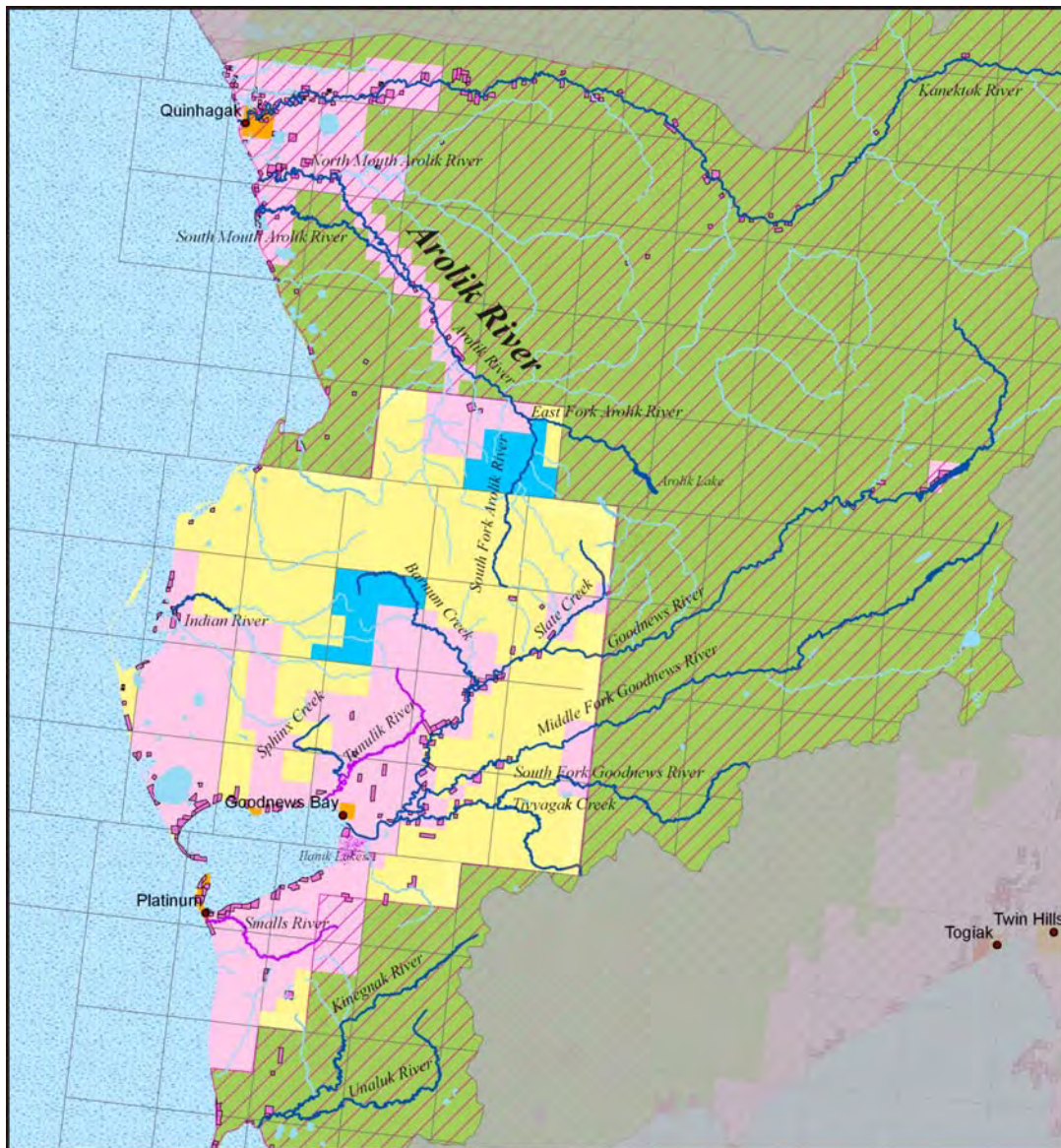


Figure 1. Map showing the location of the Arolik River within Zone 1 of HUC-30502 in the Kuskokwim River Region.

The Arolik River system has six components. Its upper reaches include two forks: the **East Fork Arolik River** and the **South Fork Arolik River**. Both forks originate in mountainous terrain about 100 air miles south of Bethel. The East Fork Arolik River heads in **Arolik Lake** in Section (Sec.) 24, Township (T.) 8 South, Range (R.) 70 West, Seward Meridian (SM), Alaska. Arolik Lake is located at an elevation of about 440 feet above sea level in the Ahklun Mountains. The South Fork Arolik River heads in Tatlignagpeke Mountain, between the Arolik and Goodnews river basins in Sec. 36, T. 9 S., R. 72 W., SM. After flowing separately for about a dozen miles, the East and South forks combine to form the **main stem Arolik River**. It flows northwesterly for approximately 15 miles and then splits into two mouths: the **North Mouth Arolik River** and the **South Mouth Arolik River**. The two mouths meander across the flats for about 20 miles before emptying into Kuskokwim Bay. The North Mouth enters Kuskokwim Bay in Sec. 33, T. 5 S., R. 74 W., SM. The South Mouth enters Kuskokwim Bay approximately two miles south of the North Mouth, in Sec. 9, T. 6 S., R. 74 W., SM.³

“Arolik” is a variant of *Aalalik*, the Eskimo name for the river, which means “ashes”—a reference to the “burnt village” (now abandoned) which was situated near the entry of the North Mouth Arolik River into Kuskokwim Bay. U.S. Coast and Geodetic Survey Chart T-3399, published in 1913, reported that the term “Arolic” meant “moon” in the Eskimo language. Variant names include Aalalik River, Arolic Creek, Arolic River, Kwiyadi Creek.⁴

The Arolik River is one of three river systems that drain the northwest flank of the Ahklun Mountains and flow through the northwest portion of the Togiak National Wildlife Refuge (Togiak NWR). Bethel is the nearest regional hub. The river flows into Kuskokwim Bay just five miles south of the village of Quinhagak.

The Arolik River system lies to the south the Kanektok River, which empties into Kuskokwim Bay at the Native village of Quinhagak. The population of Quinhagak was 228 in 1967 and 661 in 2008.⁵ The Native people of Quinhagak have traditionally made use of both the Kanektok and Arolik rivers. No permanent community has existed on the banks of the Arolik River since the abandonment of Arolik village.⁶ Arolik village was abandoned at some time between the 1890 census, when its population was listed at 94, and 1900, when it did not appear as a distinct community in the census report.⁷

The Bethel-Platinum winter trail (RST-173) provides overland access to the Arolik River. In addition, various unnamed trails—termed “Native trails”—intersect the main stem Arolik River and the South Fork Arolik River. Similar trails extend along or between various tributaries of the Arolik, including Faro Creek, Butte Creek, Deer Creek, and Keno Creek. The Goodnews-Arolik River Trail (RST-326) runs from Goodnews Bay to Kowkow Creek (a tributary of Faro Creek) and on to Snow Gulch.

The six components of the Arolik River System—the North Mouth Arolik River, South Mouth Arolik River, main stem Arolik River, East Fork Arolik River, South Fork Arolik River, and Arolik Lake—cross the eleven townships listed below.

TRM (Township, Range, Meridian)

T. 5 S., R. 74 W., SM	T. 7 S., R. 71 W., SM
T. 5 S., R. 73 W., SM	T. 8 S., R. 71 W., SM
T. 6 S., R. 74 W., SM	T. 8 S., R. 70 W., SM
T. 6 S., R. 73 W., SM	T. 8 S., R. 69 W., SM
T. 6 S., R. 72 W., SM	T. 9 S., R. 72 W., SM
T. 7 S., R. 72 W., SM	

II. Land Status

The Arolik River is bounded by federal, state, Native village and regional corporation, and Native allotment lands (Figures 2-3). Portions of the Arolik River flow through the Togiak National Wildlife Refuge (Togiak NWR), which was withdrawn in 1972 from unreserved public lands managed by the BLM under Public Land Order (PLO) 5184 and transferred to the federal refuge system under the Alaska National Interest Lands Conservation Act (ANILCA, PL 96-487) of 1980. Title to federal refuge lands in Alaska is held by the United States. The U.S. Fish and Wildlife Service (USFWS) is the manager of the Togiak NWR. The BLM administers some federal lands along the Arolik River. The State also owns lands along the Arolik River. Under the Alaska Native Claims Settlement Act (ANCSA) of 1971, the Quinhagak village corporation, Qanirtuuq, Inc., selected lands along portions of the Arolik River. The BLM conveyed the surface estate of certain of those lands to Qanirtuuq, Inc., and conveyed the subsurface estate to Calista Corporation. Under the Native Allotment Act of 1906, individuals claimed a number of Native allotments along the North and South mouths and the main stem Arolik River, within lands selected by Qanirtuuq, Inc. and Calista Corporation. The BLM certificated lands to the Native allotment applicants.

Because the North Mouth is essentially an extension of the main stem Arolik River, river miles are numbered consecutively from the mouth of the North Mouth at river mile 0 to the upper extent of the main stem Arolik River at river mile 37. The river miles of the South Mouth and the East and South forks are calculated separately, from the mouth to the upper limit of each.

North Mouth

Native corporations hold title to most of the lands along the North Mouth Arolik River and the main stem Arolik River, from river mile 0 to river mile 37. The BLM conveyed the surface estate to Qanirtuuq, Inc., under IC No. 342 and Patent No. 50-95-0284, and conveyed the subsurface estate to Calista Corporation, under IC No. 343 and Patent No. 50-95-0285. In 2006, the BLM corrected those two patents to accommodate a Native allotment and issued new patents: Patent No. 50-2006-0296 to Qanirtuuq, Inc. and Patent No. 50-2006-0297 to Calista. Qanirtuuq, Inc.'s core township, T. 5 S., R. 74 W., SM, which includes the lower seven miles of the North Mouth Arolik River, has not been

patented. Patent Nos. 50-95-0284 and 50-95-0285 do not include the submerged lands under the North Mouth Arolik River in T. 6 S., R. 72 W.; T. 5 S., R. 73 W.; and T. 6 S., R. 73 W., SM.

Eight Native allotments are clustered along the lower portion of the North Mouth Arolik River between river miles 0 and 10. The BLM certificated seven of the allotments in 1991 and one in 2005, under Native allotment certificates 50-91-0228, 50-2005-0344, 50-91-0217, 50-91-0252, 50-91-0272, 50-91-0587, 50-91-0106 and 50-91-0293. Four other Native allotments are near the North Mouth Arolik River and are accessed from the river via creeks or sloughs. The BLM certificated one in 2004, under Native allotment certificate 50-2004-0247, and the other three in 1991, under Native allotment certificates 50-91-0386, 50-91-0409 and 50-91-0479.

Native-owned lands extend from river miles 0 to 13.3. The river passes briefly through the Togiak NWR from river mile 13.3 to river mile 13.35. Lands owned by Qanirtuuq, Inc. (surface estate) and by Calista (subsurface estate) line the upper portion of the North Mouth between river miles 13.35 and 22. The North and South mouths diverge from the main stem Arolik River at river mile 22 of the North Mouth.

Main Stem Arolik River

The BLM patented most of the land along the main stem Arolik River between river miles 22 and 30.05 to Qanirtuuq, Inc. under Patent No. 50-95-0284 (surface estate) and to Calista Corporation under Patent No. 50-95-0285 (subsurface estate). Those patents do not include the submerged lands in Tps. 6 and 7 S., R. 72 W., SM. Six Native allotments are scattered along the main stem Arolik River between river miles 22 and 30. The river flows through the Togiak NWR between river miles 30.05 and 30.1. Qanirtuuq, Inc. owns the surface estate of the uplands between river miles 30.1 and 31.4, and Calista Corporation owns the subsurface estate. The main stem Arolik River flows through the Togiak NWR between river miles 31.4 and 35. Calista Corporation owns both the surface and subsurface estates of the lands along the upper two miles of the river, between river miles 35 and 37, in T. 8 S., R. 71 W., SM. The BLM patented those lands to Calista Corporation under Patent No. 50-2008-0135, pursuant to Sec. 14(h)(8) of ANCSA.

South Mouth Arolik River

Qanirtuuq, Inc. and Calista Corporation hold title to the surface estate and the subsurface estate respectively of the lands along the lower five miles of the South Mouth, under Patent Nos. 50-95-0284 and 50-95-0285. Those lands are between river miles 0 and 5.2, in Secs. 9-11, T. 6 S., R. 74 W., SM. Three Native allotments are located along that stretch of the river. The BLM certificated them in 1991 under Native allotment certificates 50-91-0611, 50-91-0432 and 50-91-0293. The South Mouth flows through the Togiak NWR between river miles 5.2 and 14.8. Qanirtuuq, Inc. holds title to the surface estate, and Calista Corporation holds title to the subsurface estate, of lands along the upper five miles of the South Mouth, between river miles 14.8 and 20. At river mile 20 the South Mouth diverges from the main stem Arolik River.

East Fork Arolik River

Most of the land along the East Fork Arolik River is within the Togiak NWR. Calista Corporation holds title to the surface and subsurface estates of the land along the East Fork between river miles 0 and 0.15, in Secs. 3 and 10, T. 8 S., R. 71 W., SM. The State owns the uplands between river miles 0.15 and 0.2. The BLM administers the lands between river miles 0.2 and 2.5 of the East Fork, in Secs. 1, 2, and 12, T. 8 S., R. 71 W., SM. The upper ten miles of the East Fork, between river miles 2.5 and 12, are within the Togiak NWR and are managed by the USFWS. The upper limit of the East Fork Arolik River is at river mile 12, at the outlet of Arolik Lake.

South Fork Arolik River

The State and the BLM hold most of the land along the South Fork Arolik River. Calista Corporation selected and received patent to the surface and subsurface estates of the land along the South Fork between river mile 0 and river mile 0.4, in Sec. 10, T. 8 S., R. 71 W., SM. The State owns the uplands along the river between river miles 0.4 and 6.2. The BLM manages the uplands between river mile 6.2 and the upper extent of the South Fork at river mile 15. Those lands are within T. 9 S., R. 72 W., SM, which was withdrawn under PLOs 5179 and 5181 for potential classification as national wildlife refuge lands.

Arolik Lake

Arolik Lake is located entirely within the Togiak NWR.

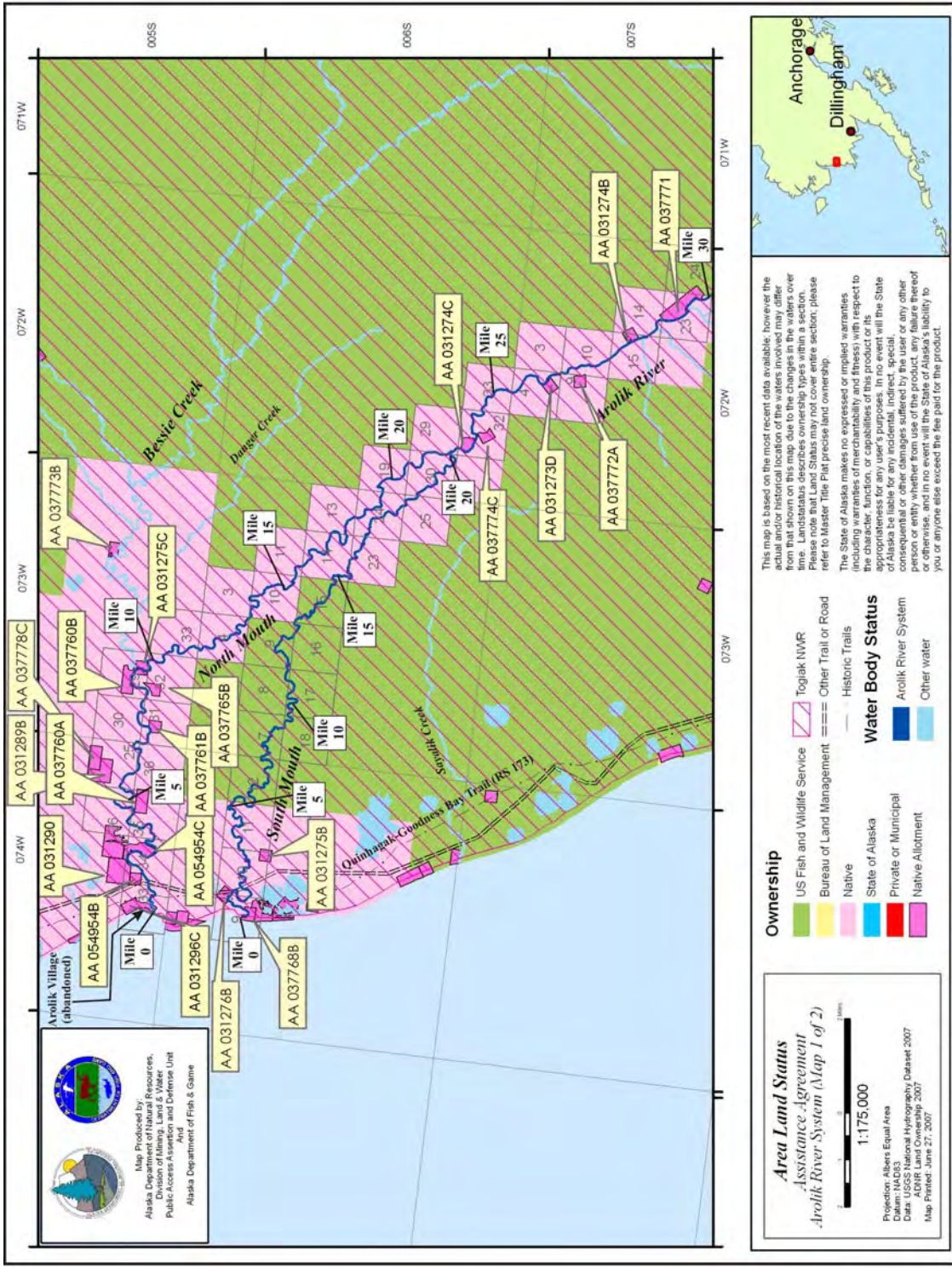


Figure 2. Map of the lower portion of the Arolik River, showing the location of village and corporations selected lands and Native allotments.

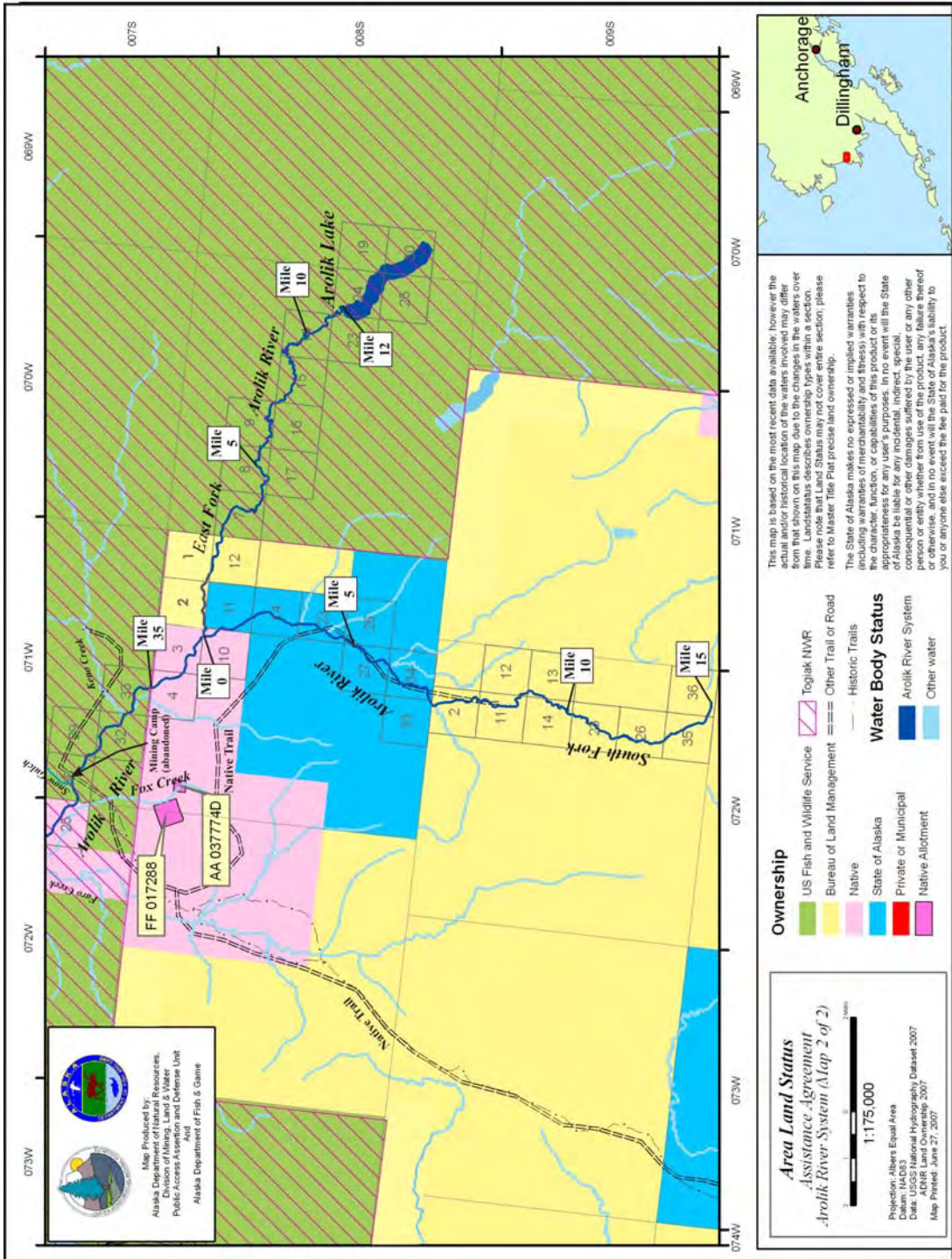


Figure 3. Map of the upper portion of the Arolik River, showing the location of village and corporation selected lands, Native allotments, and state and federal lands.

III. BLM Navigability Determinations

The BLM began actively seeking information on navigable waters in the Arolik River in the 1970s in response to land selections by the State under the Statehood Act and Native village and regional corporations under ANCSA. The BLM first addressed the navigability of the Arolik River during an Easement Task Force (ETF) meeting in Quinhagak in 1976. A summary of the ETF meeting, dated February 1, 1977, reported that only the Kanektok River was determined to be navigable in the selection area. The report stated that no other rivers in the Quinhagak village selection area were navigable “except as to the portion of each river which is subject to tidal influence.”⁸ (Attachment 1) The tidal influence for these rivers had not yet been determined and was not specified.

The ETF recommended several trail easements on the lower twenty miles of the Arolik River. A streamside easement (14 C5, D1) was recommended along both banks and the riverbeds of the Arolik River and its North Mouth in those portions of the Arolik River that flowed through the Quinhagak Village selection area to the eastern boundary of Sec. 25, T. 7 S., R. 72 W., SM, at river mile 31.4. Another streamside easement (15 C5, D1) was recommended along both banks and the riverbed of the South Mouth, from the eastern boundary of Sec. 11, T. 6 S., R., 74 W., SM, westerly to the Kuskokwim Bay (following the lower 5.2 or 5.8 miles of the South Mouth). The easements were proposed because, “the Arolik River has a highly significant present recreational use.” Bessie Creek, a tributary of the North Mouth Arolik River, and Magaktlek Creek, a tributary of Bessie Creek, also were “considered to have highly significant present recreational use.”⁹

In a March 10, 1977, memorandum identifying navigable waters, ETF member Robert Pickering wrote that between September 2, 1976, and March 10, 1977, the task force had determined that navigable waters to be excluded from the Quinhagak selection included “Tide Water.” He added that the State considered the Kanektok River and the North Mouth Arolik River to be navigable, but the BLM Task Force “did not have sufficient evidence to make a determination.”¹⁰ (Attachment 2) In a Final Easements Memorandum of October 25, 1979, the BLM dropped all of the easements along the Arolik either because “The Arolik was not determined to be a major waterway” or because the easements were “recreational in nature.” New regulations passed in 1979 made no provision for such easements.¹¹ (Attachment 3)

The BLM issued a decision to convey certain surface estate lands to Qanirtuuq, Inc. and the corresponding subsurface estate lands to Calista Corporation on November 15, 1979. Lands to be conveyed included the entire North Mouth, with the exception of Sec. 9, T. 6 S., R. 73 W., SM. That exception created a small gap in the portions of the North Mouth to be conveyed. Conveyed lands continued along the main stem of the Arolik River as far upstream as the eastern border of Sec. 25, T. 7 S., R. 72 W., SM (river mile 31.4). The Decision did not list two other sections along the main stem Arolik

River: Secs. 5 and 24, T. 7 S., R. 72 W., SM. The omission of those two sections created gaps in the portions of the main stem Arolik River to be conveyed. The BLM approved for conveyance lands along the South Mouth in Secs. 9-11, T. 6 S., R. 74 W., SM and Secs. 23-25, T. 6 S., R. 73 W., SM. The BLM did not approve for conveyance lands in Sec. 12, T. 6 S., R. 74 W., SM, and Secs. 7-9 and 15-18, T. 6 S., R. 73 W., SM. Those omissions created two gaps in the conveyance of lands in the middle part of the South Mouth Arolik River: from river mile 5.2 to river mile 5.5, and from river mile 5.8 to river mile 14.8. Thus, the BLM approved for conveyance to Qanirtuuq, Inc. (surface) and Calista Corporation (subsurface) lands along the lower five miles and the upper five miles of the South Mouth Arolik River but not along the middle ten miles. No explanation for the omission of those sections was found in the BLM easement and allotment files. No submerged lands in the Arolik System were excluded from the lands to be conveyed.¹² (Attachment 4)

The BLM's Decision of November 15, 1979, stated that Qanirtuuq, Inc. "improperly excluded" lands in its 1974 selections when the village did not select lands under waterbodies. The BLM charged the village corporation for submerged lands under certain [unnamed] waterbodies because they "have been determined nonnavigable." No basis was given for the determination of non-navigability. The Decision approved for conveyance entire sections through which the main stem and North Mouth Arolik River flow and did not exclude the riverbed.¹³ (Attachment 4)

In the early 1980s, the State took the position that the North and South mouths of the Arolik River were navigable. The State prepared a "Water Delineation Map" and submitted it to BLM. The map (Figure 4) depicts the North and South Mouths in a heavy line, indicating that the State considered both water bodies navigable.

The BLM conveyed the lands to Qanirtuuq, Inc. (IC No. 342) and Calista Corporation (IC No. 343) on June 25, 1980.¹⁴ (Attachment 5) All lands along the Arolik River System that had been approved in the November 15, 1979 Decision were conveyed without excluding the bed of the river. Several Native allotments were excluded from the conveyance, however, including an allotment that is bisected by the North Mouth Arolik River where Bessie Creek joins it in Sec. 29, T. 5 S., R. 73 W., SM, excluding that portion of the river, as well.¹⁵ (Attachment 6) The gaps that were not listed for conveyance in the Decision were also omitted from the interim conveyances.

In 1986 the BLM conducted interviews concerning the navigability of the Arolik River.¹⁶ (Attachment 7) In 1988, the BLM decided to reconsider the navigability status of the Arolik River after their Natural Resource Specialist Susan DiPrete conducted phone interviews and reviewed maps and photos. DiPrete wrote on January 27, 1988, that "I determined there to be two water bodies requiring further investigation into their navigability status—North Mouth and South Mouth Arolik River."¹⁷ (Attachment 8)

On March 29, 1988, the BLM Deputy State Director for Conveyance Management addressed the navigability of various selected (but as yet unconveyed) portions of the

main stem Arolik River and the North and South mouths. Using the new standard of a boat larger than a one-man kayak, the BLM determined the main stem Arolik River to be navigable in Sec. 24, T. 7 S., R., 72 W., SM (river mile 30.1) and the North Mouth Arolik River to be navigable in Sec. 9, T. 6 S., R. 73 W., SM (river mile 13.3). Those portions of the river were determined navigable on the basis of information from USGS maps, aerial photographs taken by NASA in 1982 and 1984, the BLM's *Alaska's Kuskokwim River Region: A History* (1985) authored by C. Michael Brown's, and interviews that BLM employees had conducted in 1986 and 1988 with individuals who were familiar with the river. Most of the six page memorandum recounts testimony from those interviews, focusing on the experiences of several river guides who had floated from Arolik Lake to tidewater on numerous occasions. Some had also used 15-18 foot boats equipped with jet units to take clients upriver into the mountainous area in T. 7 S., R. 72 W., SM (river mile 27 to river mile 31.4). The March 29, 1988, memorandum indicated that the uses of the river that supported the navigability determinations were not limited to the two tiny portions that were determined navigable. In the case of the segment of the main stem Arolik River at river mile 30.1, the memorandum stated: "Our analysis of the maps, photographs, and the testimony of three individuals with experience on the upper river all indicate that it is suitable for canoe navigation in this stretch **and beyond** during ordinary high water" [emphasis added]. Regarding the portion of the North Mouth Arolik River at river mile 13.3, the memo said: "Guides Chris Goll and William Lyle have clearly demonstrated **the river's** capacity for small craft navigation by their recent float trips" [emphasis added].¹⁸ (Attachment 9)

In the same memorandum, the BLM determined the South Mouth Arolik River to be non-navigable in selected Secs. 7, 16-18, and 20-22, T. 6 S., R. 73 W., SM (river mile 7.5 to river mile 15) and Sec. 12, T. 6 S., R. 74 W., SM (river mile 5.2 to river mile 7.5). The determination that the middle ten miles of the South Mouth Arolik River were non-navigable relied upon the same sources that were used to determine portions of the main stem and North Mouth Arolik River navigable.¹⁹

The March 29, 1988 memo also pointed out that portions of the Arolik that had already been conveyed under IC No. 342 and IC No. 343 were either tidal or larger than 3 chains wide. The memo determined the North Mouth to be tidal for its first 2 to 2.5 miles and the South Mouth to be tidal from its mouth to the eastern border of Sec. 10, T. 6 S., R. 74 W., SM (3.2 miles). Unspecified portions of the main stem Arolik River in T. 7 S., R. 72 W., SM (river mile 24.5 to river mile 31.4) were determined larger than 3 chains wide, the minimum for segregation according to the 1973 *Manual of Survey Instructions*.²⁰

In an easements recommendation issued on December 1, 1993, the BLM classified the Arolik River as a major waterway providing access “for recreationalists, miners, subsistence users and Native allotment owners.”²¹ (Attachment 10) A final easements review on July 7, 1994, stated that “The North Mouth Arolik River in Sec. 9, T. 6 S., R. 63 W., SM (river mile 13.3), was determined to be major and should be excluded from conveyance.”²² (Attachment 11)

On April 6, 1995, the BLM issued a Notice of Intent to Issue Patent for the lands that had been ICd to Qanirtuuq, Inc. (IC No. 342) and Calista Corporation (IC No. 343) in 1980. The document noted that portions of the ICd lands were not ready to be patented. The lands that would not be patented included two stretches along the North Mouth Arolik River. The first was T. 5 S., R. 74 W., SM (the Quinhagak village core township), through which the river flows in its lower seven miles. The second was Sec. 4, T. 6 S., R. 73 W., SM, through which the river flows between river mile 11.6 and river mile 13.3. The document also stated: “The navigability determination for the lands described in the enclosed draft patents remains unchanged from the time the ICs were issued [June 25, 1980]; the lateral extent of navigability or tidal influence was identified at the time of survey.”²³ (Attachment 12) The patents were issued on June 20, 1995: Patent Nos. 50-95-0284 to Qanirtuuq, Inc. and 50-95-0285 to Calista Corporation. The patents were later corrected to exclude a Native allotment, and new patents were issued under numbers 50-2006-0296 (Qanirtuuq, Inc.) and 50-2006-0297 (Calista Corporation).²⁴ (Attachment 13)

Although IC Nos. 342 and 343 conveyed entire sections through which the main stem and the North and South mouths of the Arolik River flow without excluding the riverbeds, the patents did exclude the riverbed in those sections. Thus, the beds of the North Mouth and main stem Arolik River were excluded from the patents throughout the selection area, between river mile 0 and river mile 31.4. When the BLM completed its surveys in the selection area in 1994, the Arolik River was meandered photogrammetrically and segregated from the uplands. The rectangular surveys show the main stem Arolik River and the North Mouth Arolik River as meandered and segregated in the selection area, which extends from the river mouth to the eastern boundary of T. 7 S., R. 72 W., SM (river mile 31.4).²⁵ (Attachment 14) The patents excluded the bed of the South Mouth between river mile 0 and river mile 3.2. The South Mouth does not appear on the rectangular surveys or the MTPs beyond river mile 3.2, although it did appear on earlier, unsurveyed MTPs for T. 6 S., Rs. 72, 73, 74 W., SM.²⁶ (Attachment 15)

As the BLM prepared to convey additional lands along the Arolik River that were selected by Calista Corporation, two BLM land law examiners on April 15, 1993 requested navigability recommendations on lands along the upper main stem of the Arolik River in T. 8 S., R. 71 W., SM. A month later, one of the two land law examiners wrote in long hand on the April 15, 1993, memorandum: “Per Ed Ernhardt [Earnhart], Navigability Section, under new procedures this request is not needed until confirmatory patent.”²⁷ (Attachment 16)

The BLM issued a Decision on December 13, 1995, regarding other lands in the area that had been selected by both Calista Corporation and the State. In its decision to convey some of these lands to Calista in accordance with ANCSA provisions, the BLM excluded submerged lands under rivers or streams that were at least 3 chains wide and under narrower rivers that had been determined navigable. The submerged lands were to be identified at the time of survey. The lands to be conveyed were in eight townships, and included Secs. 3, 4 and 10, T. 8 S., R. 71 W., SM, through which portions of the Arolik River system flow. The main stem Arolik River flows through Sections 3 and 4, and the South and East forks flow through Sections 3 and 10. The Decision also prepared to convey lands along a major tributary of the main stem Arolik River—Faro Creek—and its tributaries Butte, Trail, and Kowkow creeks. Those water bodies flow through Secs. 2, 3, 11-15, 22, 23, and 24, T. 8 S., R. 72 W., SM. Section 1 of that township was also included in the Decision, with the exception of Lot 1, U.S. Survey No. 9422.²⁸ (Attachment 17)

On January 26, 1996, the lands listed above in T. 8 S., Rs. 71 and 72 W., SM were conveyed in IC No. 1660, with the exclusion of submerged lands beneath rivers or streams at least 3 chains wide and any navigable waters of lesser size—to be determined at the time of survey.²⁹ (Attachment 18) During survey, the submerged lands in those townships were not meandered and segregated, and the course of the Arolik River is no longer shown on the Rectangular Survey that was issued on October 30, 2007, and on the MTP that was issued on May 1, 2008. (Attachment 14) The submerged lands under that portion of the main stem Arolik River were patented to Calista Corporation on January 23, 2008, under Patent No. 50-2008-0135.³⁰ (Attachment 19) No evidence of a navigability determination was found in the files.

The BLM prepared to convey additional lands to Qanirtuuq, Inc. and Calista Corporation in 2005. An easements notice issued on September 28, 2005, stated that lands along the main stem Arolik River were to be conveyed to Calista in Sec. 24, T. 7 S., R. 72 W., SM and Secs. 29-33, T. 7 S., R. 71 W., SM.³¹ (Attachment 20) The document did not mention that the river in Sec. 24, T. 7 S., R. 72 W., SM had been determined navigable on March 29, 1988, or that the Arolik had been proclaimed a major waterway on December 1, 1993.

The BLM issued a Decision on January 6, 2006, to tentatively approve lands for conveyance to the State. Those lands included Secs. 11, 14, 23, 26, 27, 33 and 34, T. 8 S., R. 71 W., SM, through which the South Fork Arolik River flows (and also the East Fork in Section 11). The Decision stated that submerged lands would be determined at the time of survey.³² (Attachment 21) A U.S. Rectangular Survey plat of T. 8 S., R. 71 W., SM (Group Number 979) that was officially filed on October 30, 2007, shows the area of the township where State lands are located as unsurveyed. (Attachment 14) No navigability determinations have been found specifically for the South Fork, although an attachment to a March 29, 1988, BLM memorandum on Navigable Waters in Group Survey 171 (Window 1562) mentions that there are no navigable rivers less than 198 feet wide to be excluded from Tps. 1-8 S., R. 71 W., SM.³³ (Attachment 9).

The BLM issued a final easements review on March 30, 2006, concerning lands that were awaiting patent, as well as for lands still to be conveyed in the Quinhagak village selection area. The lands to be conveyed to Calista Corporation included Sec, 24, T. 7 S., R. 72 W., SM, through which the Arolik River flows at river mile 30.1. On lands still to be conveyed to Calista Corporation, the memorandum repeated the information from the preceding easements memo, stating that the North Mouth Arolik River was a major waterway, but neither mentioned the navigability determination for the Arolik in Sec. 24, T. 7 S., R. 72 W., SM nor stated that the main stem Arolik River was a major waterway. References to two easements added in this memo indicated that the Arolik was considered a major waterway. For example, a half-acre site easement was added to either side of the Arolik River in Sec. 30, T. 7S., R. 71 W., SM (river mile 32) near the “junction with Snow Gulch...to facilitate public access to a major waterway.”³⁴ (Attachment 22)

On May 18, 2006, the BLM Navigability Section Chief issued a navigable waters memorandum that reversed the March 29, 1988, determinations that the main stem Arolik River was navigable in Sec. 24, T. 7 S., R. 72 W., SM and that the North Mouth Arolik River was navigable in Sec. 9, T. 6 S., R. 73 W., SM. The 1988 determinations had been made using the old one-man kayak standard. The May 18, 2006 memorandum did not cite a current navigability standard when it determined the Arolik River to be non-navigable in both of these sections. It stated with regard to each of the two sections:

Even though this portion of the river was determined to be navigable [on March 29, 1988], the river both upstream and downstream had been determined nonnavigable in a decision dated November 15, 1979, after which IC 342 conveyed the uplands to the village of Quinhagak. Portions were eventually patented to the corporation. Since the decision of November 15, 1979, was not appealed, it was considered final for the entire water body within the report area.³⁵ (Attachment 23)

An appendix to the May 18, 2006 memorandum listed “Navigable Waters Within Certain Village-Selected and Interim-Conveyed Lands in the Quinhagak Village Project Area.” With regard to Sec. 24, T. 7 S., R. 72 W., SM, and Sec. 9, T. 6 S., R. 73 W., SM, the memorandum’s appendix stated that there are “No navigable waters” and cited a Final Easements memorandum for the Village of Quinhagak dated October 25, 1979. That Final Easements memo did not mention the Arolik River. Under the heading of “Navigability,” it stated only:

The Kanektok River was determined to be navigable by reason of its susceptibility to travel, trade, or commerce. No other rivers were considered to be navigable except as to the portion of each river which is subject to tidal influence.³⁶ (Attachment 3)

Michael L. Menge, the Commissioner of the Alaska Department of Natural Resources (ADNR), sent a letter to the BLM's Alaska Office State Director on August 21, 2006, in which he stated, "I request you reconsider this recent shift in 25 years of BLM policy in which previous navigability determinations were not considered final decisions." He characterized the shift as "a recent, significant change in BLM policy" and referred to it as a "new interpretation of administrative finality."³⁷ (Attachment 24)

On September 11, 2006, ADNR sent another letter to the Chief of the BLM Navigability Section, objecting specifically to the BLM's May 18, 2006, reversal of the navigability status of the Arolik River within Sec. 24, T. 7 S., R. 72 W., and Sec. 9, T. 6 S., R. 73 W., SM. In the letter, Richard Mylius, the Acting Director of ADNR's Division of Mining, Land and Water pointed to information concerning use of the Arolik River that the BLM had gathered from fishing and hunting guides and from local residents after the November 15, 1979, decision to convey lands had been made. That new information had contributed to the BLM's determination on March 29, 1988, that the river within those two sections was navigable. Mylius disagreed with BLM's May 18, 2006, determination that the Arolik River was non-navigable, stating:

BLM has not resolved the issue of navigability as it relates to the Arolik River. The State asserts that the combination of historical evidence of travel, trade and commerce along the waterway and evidence of susceptibility to navigation clearly demonstrate that the Arolik River is navigable.³⁸ (Attachment 25)

On November 7, 2006, the Acting State Director of the BLM wrote to Commissioner Menge that her agency had been advised by its attorneys "that a primary purpose of section 901(c)(1) of ANILCA was to provide the Native corporations a measure of certainty and consistency with respect to submerged lands title." The Acting State Director quoted in her letter the text from Section 901(c)(1):

The execution of an interim conveyance or patent, as appropriate, by the Bureau of Land Management which conveys an area of land selected by a Native or Native Corporation which includes, surrounds or abuts a lake, river, or stream, *or any portion thereof*, shall be the *final agency action* with respect to a decision of the Secretary of the Interior that such lake, river, or stream, is or is not navigable, unless such a decision was validly appealed to an agency or board of the Department of the Interior on or before December 2, 1980. (Emphasis added)³⁹ (Attachment 26)

The Acting State Director stated that "On its face, this amendment plainly states that those determinations made in support of an ANCSA conveyance are final for the Department of the Interior." She added that "the plain language of the statute provides that the navigability determination applies to 'such lake, river, or stream' if 'any portion thereof' is included in an ANCSA conveyance."⁴⁰ (Attachment 26)

The BLM Navigability Section Chief replied to the State in a November 9, 2006 letter, stating,

I do not anticipate the subtle changes to the bigger policy will affect the outcome of our May 18, 2006, determination of the Arolik River. It would cause an inconsistent and unmanageable land ownership pattern if we were to utilize the 1988 report...I am not going to change the findings of the May report at this time.⁴¹ (Attachment 27)

No determinations of navigability or non-navigability for the North Mouth Arolik River where it bisects Native allotment AA-031275-C⁴² in Sec. 29, T. 5 S., R. 73 W., SM have been found in BLM files. The Arolik River was meandered and segregated in that parcel, and the parcel was divided into two lots, one on each side of the river. Arolik Lake and portions of the South Mouth Arolik River and the East and South forks of the Arolik River remain under the management of either the USFWS or the BLM. Excerpts from interviews in BLM files describe the East Fork Arolik River from Arolik Lake westerly as potentially navigable according to the one-person kayak standard. However, the BLM generally does not make determinations unless lands containing waterbodies are being considered for conveyance.

The determinations that the Arolik River's main stem and North Mouth are major waterways have not been reversed. The BLM has approved easements on lands to be conveyed along the Arolik because of its status as a major waterway.

Summary of Navigability Determinations: Navigability determinations for the Arolik River System are summarized below in Table 1 and shown in Figure 5.

Since 2006, the BLM has taken the position that the Arolik River System is non-navigable. The State has taken the position that the Arolik River System is navigable based on evidence of use in BLM files. While the State takes issue with what it characterizes as a BLM policy of "administrative finality," BLM maintains that it has no discretion under the Submerged Lands Act of 1988 if an interim conveyance has already occurred under ANSCA. The BLM's most recent navigability determinations do not consider any sections of the Arolik River System that were approved for conveyance to be navigable. Two sections formerly determined navigable, the main stem Arolik River in Sec. 24, T. 7 S., R. 72 W., SM and the North Mouth Arolik River in Sec. 9, T. 6 S., R. 73 W., SM, are now considered non-navigable, but they have not yet been conveyed or incorporated into a decision to convey lands. The riverbed of the North Mouth and main stem Arolik River from Mile 0 to Mile 31.4 was meandered and segregated during survey and later excluded from Patent Nos. 50-95-0284 and 50-95-0285.

Table 1: Arolik River Navigability Determinations

Date	River Section	Type Decision and Substance	Criteria
11-15-79 (Attachment 4)	Main stem, North & South mouths	BLM Decision to convey lands along Arolik River to east side of Sec. 25, T. 7 S., R. 72 W., SM. No rivers excluded.	Not stated
6-25-80 (Attachment 5)	Main stem, North & South mouths	ICs 342 & 343: Interim conveyance of land to Qanirtuuq, Inc. & Calista Corp. Same as 11-15-79 Decision.	Not stated
3-29-88 (Attachment 9)	Main stem, North & South mouths	Navigable Waters Memo in Survey 171 (Window 1562): North Mouth tidal in first 2-2.5 miles; South Mouth tidal to river mile 3.2. Portions of main stem wider than 3 chains in T. 7 S., R. 72 W., SM, but not determined navigable.	Tidal Size
3-29-88 (Attachment 9)	North Mouth, main stem Arolik River	Navigable Waters Memo: Determined North Mouth navigable in Sec. 9, T. 6 S., R. 73 W., SM & main stem navigable in Sec. 24, T. 7 S., R. 72 W., SM.	One-person kayak
3-29-88 (Attachment 9)	South Mouth	Navigable Waters Memo: Determined South Mouth non-navigable in Secs. 7, 16-18, and 20-22, T.6 S., R. 73 W., SM, and in Sec. 12, T. 6 S., R. 74 W., SM.	One-person kayak
12-13-95 (Attachment 17)	Main Stem South Fork	Decision: Calista Corporation. Secs. 3, 4, and 10, T. 8 S., R. 71 W., SM, including main stem (river miles 35 to 37), and South Fork (river miles 0 to river mile 4). Navigability to be determined at survey.	Not stated
1-26-96 (Attachment 18)	Main Stem South Fork	IC No. 1660: Interim conveyance of land to Calista Corporation. Navigability to be determined at survey.	Not stated
1-6-06 Attachment 21)	Lower East & South forks	Tentative Approval: transfer of lands to State. Sections 11, 14, 23, 26, 27, 33, and 34 in T. 8 S., R. 71 W., SM.	Submerged lands to be identified at time of survey
5-18-06 (Attachment 23)	North Mouth, Main Stem, East Fork, South Fork	BLM Navigable Waters Memo: Reversed navigability determinations of 3-29-88. Determined non-navigable: main stem in Sec. 24, T. 7 S., R. 72 W., SM and North Mouth in Sec. 9, T. 6 S., R. 73 W., SM. Confirmed previous non-navigability determinations.	Administrative finality
11-9-06 (Attachment 27)	All	BLM Navigable Waters Letter: confirmed findings of 5-18-06 memo.	Administrative finality

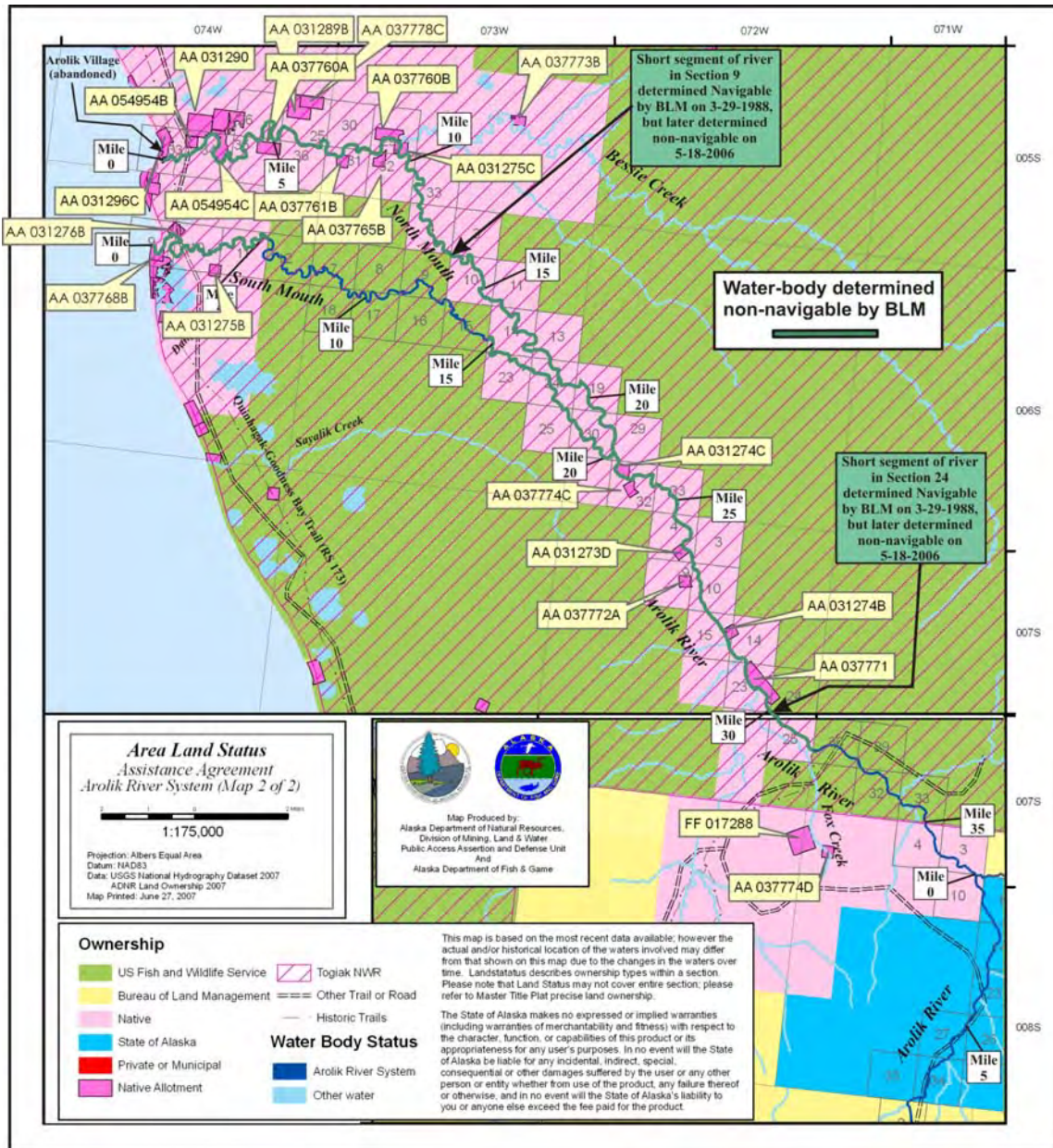


Figure 5. Map of the portion of the Arolik River determined non-navigable by BLM.

IV. Physical Character of Waterway

The Arolik River flows northwesterly from the Ahklun Mountains to Kuskokwim Bay—a distance of approximately 50 miles.ⁱ For most of that distance, its current is moderate, and its bottom is composed mainly of gravel.⁴³ Its width varies from less than 20 feet to about 200 feet, and its depth ranges from a few inches to a few feet. William Lyle, the operator of a sport fishing camp on the Arolik River, described the Arolik as “a beautiful, gentle river” with no whitewater.⁴⁴

The two sources of the Arolik River—the East and South forks—originate in mountainous terrain and then enter an upland plain. After traversing this plain for a distance of 12 river miles for the East Fork and 15 river miles for the South Fork, the forks join at river mile 37 to form the main stem Arolik River. About three river miles below that juncture, the river enters a broad valley between low mountains ranging in height from 1,000 to 2,000 feet. After 7.5 river miles, the river emerges from the mountains at about river mile 26.5. From that point to the sea, it meanders gently across low, nearly flat tundra. At approximately river mile 22, the main stem Arolik River diverges into two mouths—the North Mouth and the South Mouth—which then meander across the tundra before entering Kuskokwim Bay at a distance of two miles from one another.

The East Fork Arolik River heads in Arolik Lake (Figure 6). The lake is 2.3 miles long and 0.4 mile wide (approximately 0.9 square miles).⁴⁵ It is located at an elevation of 470 feet and is “tightly ringed by mountains.”⁴⁶ Arolik Lake ranges from 10-185 feet deep. Vegetation surrounding the lake consists of alpine tundra with a few willows along its inlet and outlet streams. Stream flow at the outlet of the lake has been recorded at 19 cubic feet per second (cfs).⁴⁷

East Fork

The East Fork Arolik River begins at the outlet of Arolik Lake. Just below the lake, the river is reported to be swift where it passes through a shallow canyon.⁴⁸ (Attachment 8) In its upper six miles, the East Fork flows slowly through braided, meandering channels beneath overhanging willows.⁴⁹ People who have floated the river in July reported shallow water in the East Fork, as river levels are normally at their lowest point of the summer. The highest levels typically occur during June (as a result of snowmelt) and in August and September (as a result of rainfall).⁵⁰

ⁱ Different sources estimate the length of the river at 50 to 69 miles. The length of the Arolik River and the river miles used in this report are based on GIS calculations using the National Hydrography Data Set derived from U.S. Geological Survey quadrangle maps.



Figure 6. View of Arolik Lake looking toward the northwest, June 2008. The outlet is on the far side of the lake. Photo by Terry Schwarz, Alaska Department of Natural Resources.

The character of the East Fork changes between the upper and lower sections. In the upper part, numerous springs contribute to the water flow, and the river bottom—consisting of 40% silt and sand and 60% fine to medium gravel—is covered with algae. The channel is often less than 20 feet wide. In the lower East Fork, however, the channel straightens and widens to 20-30 feet. Its velocity increases to more than 5 feet per second (fps), and the river bottom changes to a combination of large rocks and rubble.⁵¹ After a distance of 12 miles, the East Fork merges with the South Fork to form the main stem Arolik River (Figure 7).

South Fork

The South Fork heads in mountainous terrain between the Arolik and Goodnews river basins. It flows 14.5 miles before merging with the East Fork to form the main stem Arolik River. The South Fork, in its lower 4.5 miles (from the confluence of Crater Creek), is reported to vary from 20-100 feet in width and from 6 inches to 3 feet in depth, with no obstructions.⁵² The lower half mile of the South Fork is estimated to be 60-80 feet wide and “quite swift with a velocity of 4 fps.” The river bottom is composed mainly of coarse gravel and rock.⁵³



Figure 7. The confluence of the East Fork (center) and the South Fork (left) of the Arolik River, June 2008. The view is looking toward the west. Photo by Terry Schwarz, Alaska Department of Natural Resources.

Main Stem

The main stem Arolik River begins at river mile 37, where the East and South forks converge. It flows 15 miles before dividing into the North and South mouths at river mile 22. It has been described as having “a relatively straight channel, swift current, willow band along shore, clear water and a clean gravel bottom.”⁵⁴ Its channel is reported to range from “one to three feet deep and deeper in pools.” There are some rocks and shallow spots. From the confluence of the East and South forks to Kuskokwim Bay, the river is mainly a “meandering, slightly braided and gently flowing river.”⁵⁵

The upper portion (river miles 34-37) of the main stem Arolik River is swift, with a bottom of large gravel and rocks. Three miles below the junction of the East and South forks, at about Mile 34, the river enters a broad valley between low mountains. There it has an average width of 120 feet and an average depth of 14 inches. Velocity in this section in July was measured at 5.26 fps and flow at 720 cfs. The river bottom through the upper end of the main stem (river miles 34-37) is composed mainly of gravel (most of it coarse), along with 10% sand and 20% rock and rubble.⁵⁶

Two large tributaries (and several smaller ones) empty into the main stem Arolik River in its mountainous middle section. The large tributaries are Keno Creek and Faro Creek. Keno Creek joins the main stem Arolik River from the right, at approximately river mile 34; Faro Creek enters from the left at river mile 29.5. Keno Creek has been described as clear, about 20 feet wide and 4 inches deep, with a velocity of approximately 3 fps and a bottom composed of fine and medium gravel.” Faro Creek is considerably larger than Keno Creek and has larger gravel in its bed.⁵⁷



Figure 8. The Arolik River in Native allotment AA-37771 (river mile 29), July 23, 1984. The view is looking southeasterly. The black circle in the photo indicates the presence of a BLM survey marker. Photo by Stan Nevak, BLM file AA-37771.

The main stem Arolik River is relatively wide and unobstructed in its lower 9.5 miles. It reaches widths of three chains or wider in T. 7 S., R. 72 W., SM (between river miles 24.5 and 31.4).⁵⁸ After leaving the mountains (at about river mile 27), the main stem slows considerably in its lower section (Figure 8), and the gravel on the river bottom becomes finer, with no rocks or rubble (10% sand, 30% fine gravel, 50% medium gravel, and 10% coarse gravel).⁵⁹ In Sec. 30, T. 6 S., R. 72 W., SM, about 22 miles upriver from Kuskokwim Bay, the main stem Arolik River splits into two distributaries. The North Mouth—the larger of the two—carries 70% of the Arolik River’s flow, and the South Mouth carries the remaining 30%.⁶⁰ The character of the lower 4.5 miles of the main

stem, from the point where the river comes out of the mountains at about river mile 27, has been described as similar to the upper 12.5 miles of the North Mouth. From the mountains downstream to the mouth of Bessie Creek at Mile 9.5, the Arolik is a clear water river with a channel one to three feet deep and holes 15- to 20-feet deep in places.⁶¹ A BLM review of a NASA photograph (August 1982) reported in a March 29, 1988, navigable waters memo stated that the photo showed that the North Mouth Arolik River “exhibits a gently meandering, clear, slightly braided channel similar to that of the mainstream Arolik over its entire course.”⁶²

North Mouth

The North Mouth Arolik River flows for 22 miles over a broad, flat coastal plain to Kuskokwim Bay. It has a clear, gently meandering, slightly braided channel with a gradient approaching five feet per mile. Most of the North Mouth Arolik River is less than three chains wide. Its depth has been estimated at 2-3 feet at most.⁶³ (Attachment 7)

The upper North Mouth, to just below Bessie Creek has a current averaging 2 mph and a bottom composed of 20% sand and silt, and 80% gravel, most of it fine. The streambed meanders considerably and is characterized by braided channels.⁶⁴ Thick bands of willows line the banks.⁶⁵ A width of 25-50 feet—with a sufficient volume of water for boats—was reported at river mile 15.5.⁶⁶

At river mile 9.5, the North Mouth’s major tributary, Bessie Creek, enters from the right. Bessie Creek has been described as small in size, with a slow current.⁶⁷ It introduces iron-colored water into the clear water of the North Mouth.⁶⁸ (Attachment 7) This tributary marks the transition between the upper and lower portions of the North Mouth.

The lower North Mouth Arolik River is considered to be quite different from the portion above Bessie Creek. Below Bessie Creek, the North Mouth slows down and flattens out (Figure 9), flowing between banks covered mainly with tall grass.⁶⁹ (Attachment 7) The river bottom is composed of mud and fine gravel.⁷⁰ “Big prop boats” can make use of the lower section of the river.⁷¹ (Attachment 8) Its width reaches 200 feet, especially in the portion that is under tidal influence.⁷² Tidal influence has been estimated to extend for a distance of two to ten miles.⁷³ In 1921, George L. Harrington of the USGS reported that the lower reaches of the Arolik River were tidal and that ascents of the river were usually undertaken during the flood tide so as to avoid the “appreciable current on the ebb or slack tide.” He described the lower portions of the river as “relatively sluggish” with a “tortuous” channel.⁷⁴ The water level of the North Mouth Arolik River fluctuates for reasons other than the tides. Heavy rains that normally occur over a two-week period in August and September, for example, can cause the river to remain high for two to three days.⁷⁵ (Attachment 8)



Figure 9. The Arolik River at Native allotment AA-54954-C (river mile 2), August 27, 1999. The view is looking northeast. Photo by BLM Realty Specialist Boyce Bush, BLM file AA-37771.

South Mouth

The South Mouth leaves the main stem Arolik River in Sec. 30, T. 6 S, R. 72 W., SM and meanders across the tundra for approximately 20 miles before emptying into Kuskokwim Bay two miles south of the mouth of the North Mouth Arolik River. The South Mouth is significantly smaller than the North Mouth and carries less than half the volume of water. It has been described as wide and meandering, with a single channel and a negligible gradient. It has no significant tributaries, but it does have a long, meandering, 25 to 50-foot wide slough and several smaller, interconnected sloughs between river mile 3.3 and river mile 15.5.⁷⁶

Upstream from the area of tidal influence, the South Mouth Arolik River has been described as very shallow (with as little as 2-3 inches of water in places). The tidal influence has been estimated to extend to river mile 3.3.⁷⁷ (Attachment 8) At high tide, the lower section can accommodate a boat 26 feet in length with twin seventy horsepower outboards (propeller). However, when the tide goes out, such a boat would run aground.⁷⁸ (Attachment 7) A sport-fishing guide described the South Mouth as a “slough-like water body” with “hardly any water” in it.⁷⁹ (Attachment 8)

In addition to the tidal influence and the regular fluctuations in water level that occur during the summer, the Arolik River is also subject to irregular fluctuations that result from variations in snow pack, spring air temperatures, and extraordinary amounts of rain that are produced by autumn storms. One source noted that breakup stream-flow rates in the region are highest after winters of heavy snow in the mountains, especially during years when spring air temperatures are also abnormally high.⁸⁰ Another source said that in years of heavy snow pack, the river can stay high all summer.⁸¹ (Attachment 7)

Between the early 1950s and the early 1980s, a combination of permafrost damage and erosion/accretion changed the course of the main stem Arolik River in Sec. 30, T. 7 S., R. 71 W., SM, between river mile 31.5 and river mile 32.5, just upriver from Snow Gulch. As early as 1953, aerial photographs revealed that water from the main stem Arolik River at river mile 32.5 had begun to enter a section of the “Native Trail” that ran roughly parallel to the river on its northern side (Figure 10). Melting of the permafrost under the trail produced depressions that permitted this to happen. By 1957, the permafrost-damaged trail admitted a significant volume of water and had widened to become a minor channel of the river (Figure 11). Meanwhile, sediment continued to accumulate on the inner side of the bend of the old main channel at river mile 32.5. Those deposits impeded the flow of water into the old channel. By 1982, the main channel of the river had broken through to the trail at river mile 32.5 (Figure 12). The river flowed down the trail for a distance of approximately one-half mile before turning to the north into what had been a former slough or minor channel of the river. The new main channel (Figure 13) continued to the north of the trail and parallel to it for about one-half mile before turning to the southwest near Snow Gulch. The old main channel of the river between river mile 31.5 and river mile 32.5 had been transformed into a mile-long slough or minor channel. It is likely that other, similar, events took place in the distant past and at other locations in the Arolik River System.

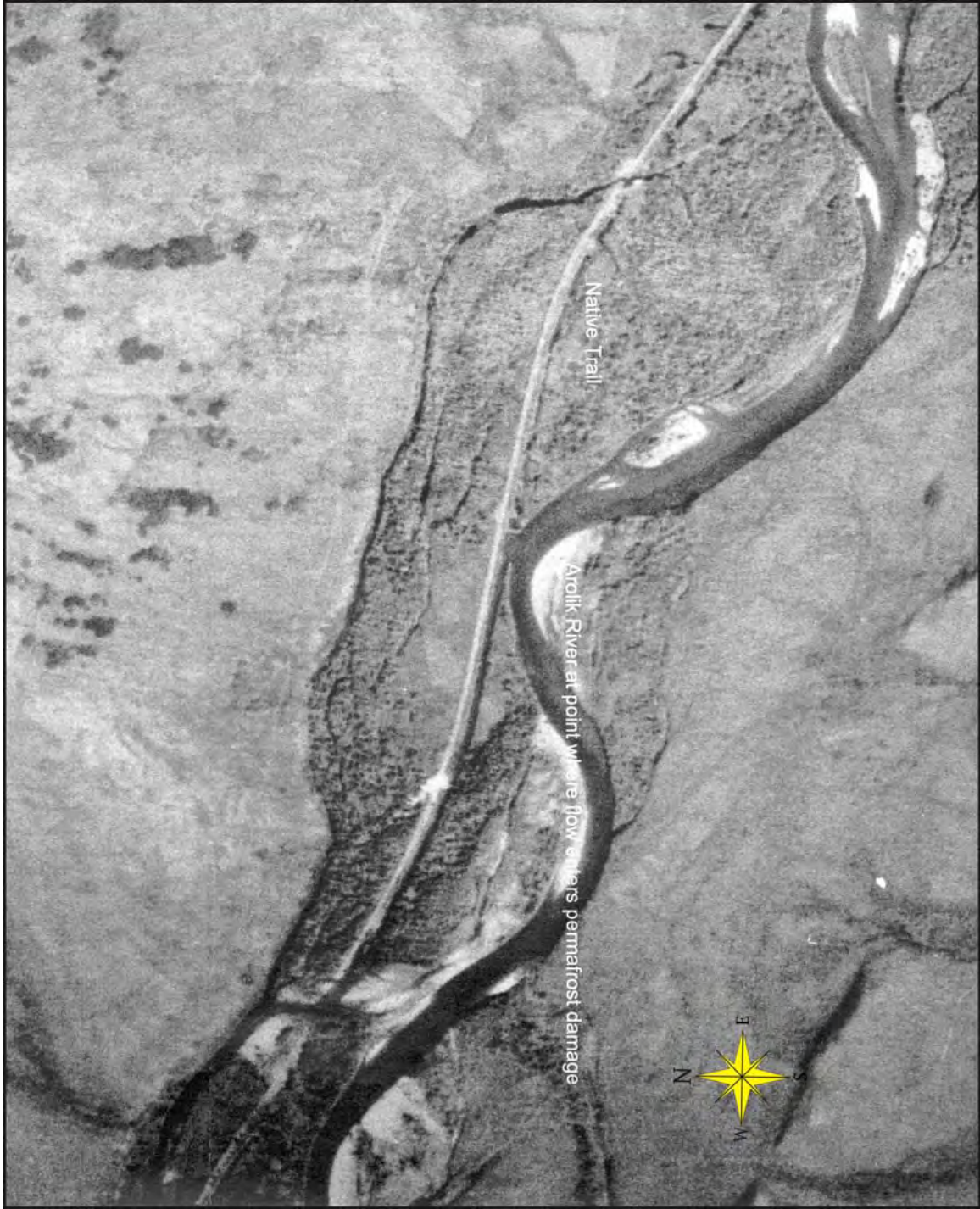


Figure 10. Aerial photograph of the Arolik River just southeast of Snow Gulch, 1953. USGS aerial photo 0122 8/2/1953.

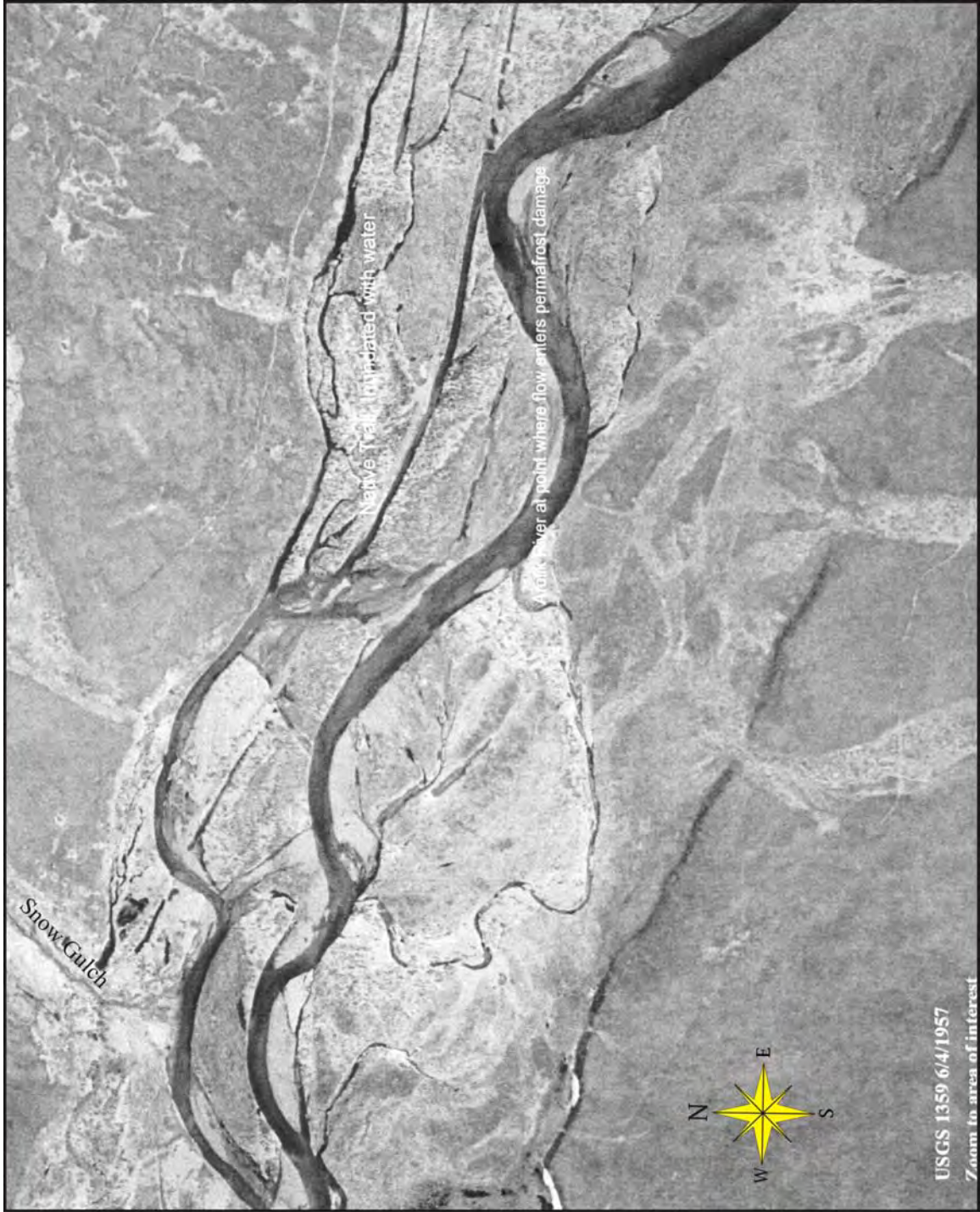


Figure 11. Aerial photograph of the Arolik River just southeast of Snow Gulch, 1957. USGS aerial photo 1359 6/4/1957.



Figure 12. Aerial photograph of the Arolik River just southeast of Snow Gulch, 1982. USGS aerial photo 566-3112 8/5/1982.



Figure 13. Looking down the main stem of the Arolik River toward Snow Gulch, June 2008. The view is looking northwest. Note the tailing piles along Snow Gulch at the upper right. Photo by Terry Schwarz, Alaska Department of Natural Resources.

V. Evidence of Use of the Waterway

Early Native Use of the Arolik River

Eskimo people have lived along Alaska's western coast for thousands of years.⁸² The Central Yup'ik Eskimos inhabited the Southwest coast, and the Caninermiut subgroup occupied the eastern side of Kuskokwim Bay, including the Quinhagak area. The Central Yup'ik established permanent villages that formed a central base from which they wandered in an annual round of subsistence activities. Their subsistence lifestyle centered on salmon fishing and also involved fishing for freshwater fish, hunting sea mammals, land mammals, and waterfowl, and gathering berries.⁸³

Small Native settlements were located at various points along the Arolik River, although there are none today. The population of nearby Quinhagak, situated near the mouth of the Kanektok River, grew with the influx of people from settlements on Arolik River and elsewhere. Although Quinhagak is located on the coast, its residents oriented their subsistence activities more toward the rivers and inland areas than toward the sea.⁸⁴

Quinhagak people use the Arolik River, as well as the Kanektok, in their resource harvesting efforts. As anthropologist Robert J. Wolfe wrote of Quinhagak in 1984, “Inland hunting and fishing up the rivers are central features of the economy.”⁸⁵ This inland orientation was probably stronger in the past, when more up-river settlements existed.

Arolic village, situated near the mouth of the North Mouth, was depicted on a map that was made by USGS geologist George L. Harrington after his inspection trip to the area in the summer of 1919. Harrington’s map shows another “Native Village” on the right bank of the North Mouth Arolik River just below the mouth of Bessie Creek and two Native houses farther upstream. One was on the left bank of the main stem Arolik River several miles upstream from the point where the North and South mouths diverge from the main stem Arolik River. Another house site was several miles farther upstream, on the right bank of the river in the area where it emerges from the mountains.⁸⁶ (Figure 14) Geologist Irving Reed, who made a reconnaissance of the area in 1931 for the Territory of Alaska Mining Department, referred to “igloos” (presumably Native dwellings) in his report. He located the “igloos” on his sketch map just below the point at which the main stem Arolik River leaves the mountains, at the approximate location where Harrington had noted the existence of a Native house.⁸⁷ (Figure 15)

The 1880 census recorded the population of “Arolic” village (called *Aguliagamute* by census taker Ivan Petroff) as 120, which was larger than that of Quinhagak, at 83.⁸⁸ By 1890, the population of Arolic village had fallen to 94, while that of Quinhagak had grown to 109. By the end of the nineteenth century, Quinhagak had continued to grow, while Arolic village ceased to be listed in the census as a distinct community. In 1900, Quinhagak’s population had reached 201, before falling to 111 in 1910. Between 1920 and 1960, Quinhagak’s population fluctuated between a low of 193 and a high of 230, before surging to 340 in 1970.⁸⁹

Quinhagak’s growth resulted from the migration of people to the village from surrounding areas. The Moravian Church established a mission there in 1894, and, beginning in 1903, a succession of missionary families served in the village for many years with the assistance of Native Helpers. The missionaries provided schooling, medical care, and spiritual ministry. They also operated a small store. Those services probably made the village attractive to people from the Arolik River drainage and other nearby areas.⁹⁰

The experience of Quinhagak elder Paul Jones was typical of individuals who lived in villages and camps on outlying rivers and streams during the late nineteenth and early twentieth centuries and later moved to Quinhagak. He had spent his early childhood “in spring, summer, and winter camps mainly on the Kanektok and Arolik rivers with his parents” and had moved with his parents to Quinhagak when he was older. After his family moved to Quinhagak, he continued to engage in subsistence activities in the Arolik River drainage, as well as in the Kanektok and Kuskokwim river drainages and on Kuskokwim Bay.⁹¹ Like Jones, many Quinhagak residents made use of both the

Kanektok and Arolik rivers. Some people continued to live at Arolic village after 1890, at least for part of the year. For example, Sam Pleasant, Sr. stated in an affidavit that he was born in the fall of 1936 at Arolic, Alaska, and had lived in Quinagak since then.⁹²



Figure 14. USGS map from 1919 showing the Arolik River, including the North and South mouths. Map reproduced from Harrington, *Mineral Resources of the Goodnews Bay Region*, p. 214a.

In 2002 and 2004, representatives of the Bristol Bay Native Association, USFWS, and Alaska Department of Fish and Game (ADF&G) interviewed six Yup'ik elders, including several from Quinhagak, for a report on fish populations of the Kuskokwim Bay region. The elders were chosen by their communities to participate because of their "extensive knowledge...of subsistence fisheries and the local environment." They had engaged in subsistence fishing activities at a very young age and had learned about fish harvesting from their parents, grandparents, and community elders.⁹³

The testimony of the elders reflected changes they had witnessed in the course of their lives. The study covers the period from 1916 to 2004, beginning with the year in which the eldest participant was born and ending when the project began. The authors divided the time span into four periods: 1916-1929, 1930-1954, 1955-1979, and 1980-2004. They explained that each period, except the first, covers 25 years.⁹⁴ The first of those time periods is described in this section. Additional information about the subsistence economy of Quinhagak village is drawn from Robert J. Wolfe's 1984 subsistence study of Quinhagak (and other southwest Alaska communities). Quinhagak people made use of both the Kanektok and Arolik Rivers. For example, Paul Jones (born in 1923) of Quinhagak spent his early childhood "in spring, summer, and winter camps mainly on the Kanektok and Arolik rivers with his parents before they moved to Quinhagak." Mr. Jones's subsistence activities were "concentrated in the Kuskokwim, Kanektok, and Arolik River drainages and Kuskokwim Bay."⁹⁵ Since Quinhagak people made use of both the Kanektok and the Arolik rivers, the Quinhagak elders' description of their seasonal round of subsistence activities applies generally to both rivers.

Between 1916 and 1929, the Native people moved among seasonal camps "following resource abundance." In winter, they traveled by dog team, and in summer, they used "kayaks and oar boats, which they poled upriver" or small boats with sails. Outboard motors were few. In spring, people moved to muskrat trapping camps. After returning to the village, they moved to fish camps in order to harvest salmon. In the spring, Quinhagak people dispersed to seasonal camps along the Kanektok drainage, while some families traveled toward the mountains to trap parka squirrels and other fur bearers. While some families remained at their spring camps during the summer for salmon fishing, others returned to Quinhagak. Elders "drifted down the river in boats or kayaks, pushing with a pole or oar." King salmon arrived first in the rivers, followed by sockeye and chum salmon. Silver and pink salmon arrived in August. In late summer and early fall, some people went upriver to hunt migratory birds, bears, or an occasional moose, or to put up fish for the winter. Some families remained upriver through the winter. Fish were harvested through the ice all winter. Quinhagak elders indicated that subsistence activities followed "an ebb and flow of targeted resources depending on the season, but fish were pursued year round."⁹⁶ Large numbers of fish were harvested for consumption by people and dogs, and for sharing. Some were traded.

In addition to harvesting resources for subsistence, the people of southwest Alaska engaged in trapping and fishing for the purpose of trade. Before the existence of a cash economy, "furs and occasionally fish were...used as a form of currency for basic trade

items such as tea, coffee, sugar, flour, rifles, ammunition, pots and pans, some clothing, and occasionally milk.”⁹⁷ According to Wolfe, “Trapping activity...remained highly productive into the 1930s.” Some of the fur trade was international in scope. Wolfe stated that “Parka squirrels and marmots were major trade items historically, traded from the Kuskokwim area north to the Yukon River for caribou and domestic reindeer skins from Siberia via Bering Strait and Norton Sound traders.”⁹⁸

Little wage work was available during this period. Few Native people harvested or processed fish for the canneries. According to Wolfe, “they were kept out of the processing sector by discrimination on the part of cannery operators.”⁹⁹

Winter trails for dog teams connected the villages. During 1923, trails from Bethel to Quinhagak and Quinhagak to Goodnews Bay were staked, and cabins were built along the way to shelter travelers.¹⁰⁰

The Native people of Quinhagak used the Arolik River for access to areas where resources were seasonally abundant. In spring, summer, and fall, they plied the rivers in small, shallow-draft boats, including kayaks and oar boats that they propelled upriver by poling. They boated upriver to areas that traditionally were favorable for fishing, hunting, trapping, and berry picking. They also drifted downriver from spring camps. Quinhagak residents harvested resources for subsistence (direct personal use and sharing), for “fuel” for transportation, and for the means to acquire trade items. Some furs—particularly parka squirrels—were traded internationally.

Non-Native Use Prior to Statehood

During the first few decades of the twentieth century, prospectors and gold miners formed the most significant group of non-Native users of the Arolik River and its tributaries. In 1921, George L. Harrington of the U. S. Geological Survey (USGS) wrote, “Practically every white man in the region has had at some time during the last three years an interest in one or more claims in the Arolic basin.”¹⁰¹ Gold mining activity took place in the Arolik River basin from about 1900 until World War II. The number of miners and mining operations fluctuated, and the scale of the mining activity remained relatively small. However, mining was significant locally, and gold from the Arolik River drainage contributed to the overall placer gold production of the Kuskokwim region, which reached \$1,299,000 in 1940.¹⁰²

Geologists working for the USGS and the Alaska Territorial Department of Mines conducted field investigations and compiled contemporary data on prospecting, mining operations, and gold production. They also commented on the role of the Arolik River as a summer transportation route for the supplies that miners brought in by boat from Bethel or Quinhagak. Much of the information presented in this section is drawn from their reports. Although mining waned after World War II, interest in the gold deposits has

continued to the present time, as new landowners have touted the potential of the area's gold-bearing gravels and the ease of access afforded by the Arolik River.

Gold discoveries were made on the Arolik River and its tributaries by prospectors who rushed to the Kuskokwim region from other Alaskan gold fields around the turn of the twentieth century, following a series of rumored and actual strikes. The first rumors circulated late in the summer of 1900 and attracted prospectors from Nome and from the Yukon River as far upstream as Rampart.¹⁰³ Most of the gold seekers failed to find gold in paying quantities and returned to Nome the following spring, but “a small number of men from Nome” continued to work around the mouth of the Kuskokwim River for the next several years.¹⁰⁴ They discovered gold in a number of locations, including on Butte Creek, a tributary of Faro Creek, which flows into the main stem Arolik River at river mile 29.5.¹⁰⁵ Bethel served as a major supply point for the gold seekers in the Lower Kuskokwim area.¹⁰⁶

Prospecting in the Arolik River drainage focused on streams heading in the mountainous area through which the main stem Arolik River flows for six miles between river mile 34 and river mile 28. A number of tributaries enter the Arolik River in this stretch, notably Keno Creek at about river mile 34, Snow Gulch at about river mile 32, Fox Creek at river mile 31.4, Faro Creek at river mile 29.5, and Boulder Creek at about river mile 28. The most significant gold discoveries and subsequent mining activity took place on two Faro Creek tributaries—Butte and Kowkow creeks—and at Snow Gulch. Small quantities of platinum were also found.¹⁰⁷

Butte Creek began producing gold at least as early as 1904, making it the first productive stream in the Arolik River drainage.¹⁰⁸ Nearby Kowkow Creek began producing gold in 1913. The gold placers in the Arolik basin were located mainly in wide gravel-filled valleys between low hills. Miners used open-cut mining methods to extract the gold. They removed the overburden by groundsluicing—using the abundant water produced by spring snowmelt—and then began “shoveling in” operations. Mining continued through the summer months and into late September or even into October.¹⁰⁹

The prospectors and miners who worked in the Arolik River drainage relied upon traders in Bethel and Quinhagak for their supplies, since supply points never developed along the Arolik River.¹¹⁰ The Arolik River served as a transportation route for conveying supplies to the camps and for travel to and between mining camps. In 1921, USGS geologist George L. Harrington said that supplies bound for the Arolik basin gold mining operations were brought in from Quinhagak “either by poling boat in the summer or by dog sled in winter and early in the spring.”¹¹¹

By 1919, an estimated \$100,000 in placer gold had been mined in the Arolik River drainage. Butte Creek accounted for 70% of that production. Kowkow Creek and several other streams contributed the remaining 30%. Mining had also taken place along Trail and Fox creeks, and Snow Gulch. In 1919, Harrington observed active mining operations only on Kowkow Creek. Although prospecting yielded promising results in

numerous locations, mining proved profitable in only a few of them. As Harrington stated in 1921, “Each influx of prospectors was encouraged by the finding of gold in the streams they prospected, but after working for a time most of them failed to develop profitable ground and left.”¹¹²

In September 1926, USGS mining engineer Frank W. Holzheimer assessed the dredging potential of various prospects in the Arolik River drainage. He found prospectors at work on Kowkow, Faro, Trail, and Fox creeks, and at Snow Gulch. Claims had been staked, and drilling had taken place from Snow Gulch, at river mile 32, downstream to about river mile 27.¹¹³

In 1931, geologist Irving Reed conducted a field investigation of the Goodnews-Arolic gold fields and reported that a considerable amount of prospecting using drilling equipment had been done in the Arolik basin between 1928 and 1930. During that time, prospecting and/or mining had taken place at numerous locations between river mile 29.5 and river mile 34 of the main stem Arolik River, including on Butte, Kowkow, Trail, Faro, Fox, Deer, and Keno creeks, Snow Gulch, and on the Arolik River itself.¹¹⁴ Reed’s 1931 map shows Fox Creek, a left bank tributary of the main stem Arolik River, as flowing into the Arolik River at river mile 31.4 (Figure 15).¹¹⁵

Geologists who inspected the mining operations described prospectors’ and miners’ use of boats to transport supplies upstream to their operations. In 1931, Reed noted that from Quinhagak, “a small outboard motorboat may be taken along the coast and up the north mouth of the Arolic River as far as the mouth of Bessie Creek [river mile 9.5] in the lowest stage of water. In high water it is possible to take a boat up the Arolic to the mouth of Faro Creek [river mile 29.5].” Reed said that although equipment and most supplies bound for the gold fields in the Arolik River area were freighted overland in winter from Quinhagak, “Such other accessory supplies as were needed during the summer were taken in by poling boat up the Arolic.” Reed did not provide examples of the types of supplies that were shipped in by poling boat or the equipment and supplies that were freighted overland in winter. He envisioned future overland routes for freighting heavy equipment to mines on the Faro Creek tributaries. However, he also predicted that miners would continue to use outboard motorboats or poling boats to take light supplies and perishables up the Arolik River.¹¹⁶

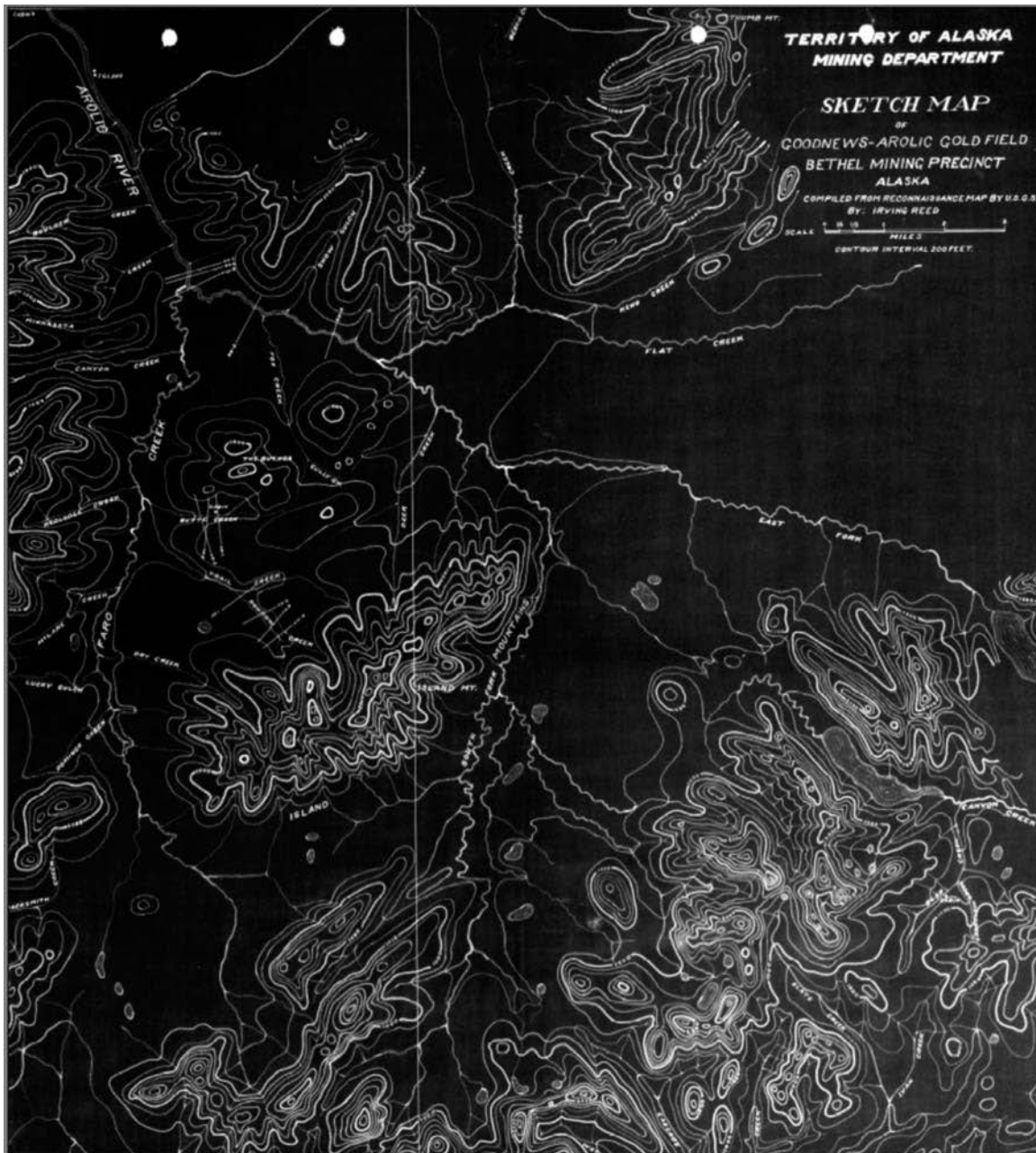


Figure 15. Sketch Map of Goodnews-Arolic Gold Field, Bethel Mining Precinct, Alaska 1931. Map drawn by Irving Reed and reproduced from his *Report on the Placer Deposits of the Goodnews-Arolic Gold Field* (MR-101-02), 1931, p. 28a.

In addition to facilitating supply and resupply of prospecting sites and mining camps, the Arolik River allowed for travel between prospecting sites. Reed outlined Frank V. Smith's busy prospecting schedule in the summer of 1930, documenting his travels from one drill site to another on the Arolik River and its tributaries (Figure 16). From June 24 to July 6, Smith and his crew of several men drilled on the Arolik River one mile below the mouth of Keno Creek (river mile 33). Then they traveled several miles downriver, and from July 14 to August 4, they drilled near the mouth of Faro Creek (river mile 29.5). They then went back up the Arolik River, and from August 5 to August 14, they drilled one-half mile below the mouth of Snow Gulch (river mile 31.8). They then traveled downriver again, and from August 16 to August 20, they drilled on Faro Creek just above the mouth of Canyon Creek. Then they traveled down Faro Creek, and from August 21 to August 31, they drilled on the Arolik River 600 feet below the mouth of Faro Creek (again, river mile 29.5). Reed did not specify the means by which Smith transported several workers, tent(s), drill rig, and other equipment and supplies between those drilling camps, and presumably down the river to its mouth at the end of the season. However, Reed did include in his report a photograph of Smith's drilling camp on the Arolik River near the mouth of Fox Creek [river mile 31.4]. In the foreground of that photograph, there is a river boat, hauled up from the riverbank and overturned (Figure 17).¹¹⁷



Figure 16. Frank V. Smith's drilling crew at work next to the Arolik River near the mouth of Fox Creek, July 1931. Photograph by Irving Reed, reproduced from his *Report on the Placer Deposits of the Goodnews-Arolic Gold Field* (MR-101-02), 1931, p. 23a.



Figure 17. Frank V. Smith's camp on the Arolik River near the mouth of Fox Creek, July 1931. A flat bottom boat is lying upside down next to the Arolik River. Photograph by Irving Reed, reproduced from his *Report on the Placer Deposits of the Goodnews-Arolic Gold Field* (MR-101-02), 1931, p. 23a.

Some prospecting in the Arolik basin involved companies from outside of the region. For example, in 1926 the Arolic Dredging Co., of Fairbanks, drilled at the head of Kowkow Creek.¹¹⁸ In 1930, Frank V. Smith sank lines of drill holes on the Arolik River at the mouths of Faro and Keno creeks for the Hammon (or Hammond) interests of San Francisco.¹¹⁹ Thus, Smith's prospecting and his travels between prospecting sites were part of a larger commercial enterprise that extended beyond Alaska.

In 1931, nearly all of the prospectors and miners had gone to the platinum-mining areas to the south of Goodnews Bay, leaving only one man prospecting on Kowkow Creek (and on upper Trail Creek, in his spare time).¹²⁰ However, developments that occurred in the early 1930s sparked renewed interest in mining in the Arolik River drainage and throughout Alaska. In 1933 the price of gold rose to \$35 per ounce from just under \$21 per ounce, and the Reconstruction Finance Corporation (RFC) began to issue loans to gold, silver, and platinum mining operations.¹²¹ Low interest rates and "permissible deductions...for unprofitable business undertakings" encouraged outside investments in Alaska mining.¹²² The overall value of placer gold production in the Kuskokwim region (including the Arolik River drainage and the Goodnews Bay district) surged from \$228,000 in 1935 to \$1,299,000 in 1940.¹²³

In 1936, Philip S. Smith of the USGS described "a considerable revival of interest in gold mining" in the Goodnews Bay district (including the Arolik River drainage). Butte Creek

had produced a small output of gold, hydraulic equipment was about to be installed on the Arolik River, and “many rumors” of “rich strikes” had caused a “mild stampede” to the Arolik basin.¹²⁴ By 1937, nearly 200 claims had been staked along the Arolik River, many of them on ground where old placer claims had been worked previously. Mining companies leased dozens of claims. The Goodnews Bay Mining Company leased 41 claims on the Arolik River between Keno and Boulder creeks. Strandberg and Sons leased 51 on Snow Gulch, lower Faro Creek, Keno Creek, and Fox Creek. The Clendon Company held 45 on Trail, Faro, Deer, and Kowkow creeks. Others held claims on the East and South forks (river mile 37), on Canyon Creek (a tributary of Faro Creek), and on Minnesota Creek (river mile 28.5).¹²⁵ In 1938, Kowkow Creek led the Arolik River drainage in placer gold production, surpassing Butte Creek and Snow Gulch. In 1939, Associate Engineer J. C. Roehm of the Territorial Department of Mines visited the region and found 54 men working claims on tributaries of the Arolik River.¹²⁶ In 1940, Philip S. Smith reported that the Goodnews Bay district, which included the Arolik River drainage, had experienced “an enormous spurt” in prospecting and development of gold placers.¹²⁷

Mining operations on the Arolik River and its tributaries became more mechanized during the 1930s, but no dredges were used, despite the interest that had prompted Holzheimer’s investigation of dredging potential in 1926. By 1938, dragline equipment was in use on Kowkow Creek, a bulldozer on Butte Creek, and “simple hydraulic methods” on Snow Gulch.¹²⁸ In 1940, the Goodnews Bay Mining Company, which held 41 claims on the Arolik River between Boulder and Keno creeks (river miles 28 and 34),¹²⁹ used hydraulic and dragline equipment at Snow Gulch, and on Butte Creek, seven men were mining with a bulldozer and hydraulic methods.¹³⁰

Historic records indicate that miners used a variety of means to access and supply their operations. The Arolik River afforded a summer supply route for the miners. They used poling boats and outboard motorboats to carry supplies and light equipment upstream to the mountainous area of the river’s upper main stem. However, boats were not suitable for transporting large pieces of heavy equipment. In the 1920s, miners freighted heavy equipment overland by dog sled to the creeks in the winter and early spring, while snow was still on the ground.¹³¹ In 1926, Holzheimer reported that winter transportation to the mines was by dog team.¹³² In 1931, Irving Reed wrote that most supplies were freighted to the mines in winter by dog team via Quinhagak. Other accessory supplies were taken in by poling boat up the Arolik.¹³³ The introduction of tractors in the 1930s made it easier for miners from Quinhagak and Bethel to transport heavy equipment overland in winter to the Arolik River drainage. In 1937, David Strandberg transported a Bucyrus six-inch drill by caterpillar tractor over a route, picked by himself, from the north side of Goodnews Bay, following gravel ridges along the foothills of the mountains into the Arolik basin. The route avoided the swampy ground between Kuskokwim Bay and the mountains that made overland transportation so difficult.¹³⁴ Strandberg pioneered the 32-mile-long Goodnews-Arolik River Trail from Goodnews Bay to Kowkow Creek and on to Snow Gulch.¹³⁵ (Figure 3) He and other miners and local Natives also developed trails that parallel both banks of the Arolik River between Snow Gulch and Keno Creek,

between Fox Creek and Deer Creek, along Fox Creek to mining areas along Butte, Trail, and Kowkow creeks, along Keno Creek upstream to the mouth of Tyone Creek, and along Faro Creek to Domingo Creek.¹³⁶ Miners also built airplane landing sites at the mouth of Snow Gulch and in the mining area on Kowkow Creek.¹³⁷ Airplanes were used to bring in supplies to southwest Alaska mining areas. Roehm noted that during the 1937 season, “several tons of fresh vegetables were shipped by airplane from Matanuska Valley to Goodnews Bay.”¹³⁸ Information about quantities of supplies that may have been flown in to Snow Gulch and Kowkow Creek was not found. Throughout the 1920s and 1930s, access to the mining sites on the Arolik River gradually shifted from using boats in the summer and sled dogs in the winter, to caterpillar tractors in the winter and summer, and to airplanes in the winter and summer. Historic sources do not indicate what percentage of each of these means of conveyance was used at any given time.

The geologists who conducted field inspections in the Arolik basin between 1919 and 1939 emphasized the importance of the Arolik River as a supply route for the placer gold mines in the area. Geologists who visited the region traveled by boat when they could and on foot when water in the river was low. If they had to travel by foot, they traveled light and kept mainly to higher ground. Harrington, for example, reached Kowkow Creek in 1919 by hiking in from the Goodnews River drainage via Wattamuse Creek. He spent a few rainy, foggy, windy days working in the vicinity of Kowkow and Butte creeks before hiking back to Wattamuse Creek and then boating down the Goodnews River to Goodnews Bay.¹³⁹ In September 1926, Holzheimer hiked in to the mining areas of the Arolik River drainage from the head of Jacksmith Bay (located to the south of the Arolik River). He spent two days investigating Kowkow and Trail creeks in the Arolik drainage and three creeks in the Goodnews River drainage before returning to Quinhagak in one day by boat via the Arolik River.¹⁴⁰ In early July 1931, Reed and an Eskimo guide left Quinhagak in an outboard motorboat, intending to motor up the Arolik River to the mining areas. They encountered “extremely low water” during the driest part of what Reed described as an especially dry summer, and they decided to abandon their boat “a short distance above the old native village on the Arolik River,” most likely the one that was located just below the mouth of Bessie Creek (river mile 9.5). Reed shouldered his pack and hiked to the creeks at Butte, Kowkow, Deer, and lower Keno creeks, Snow and Fox gulches, and the Arolik River before returning to Quinhagak on July 8.¹⁴¹

World War II construction projects drew miners and mining equipment (such as draglines and tractors) away from gold placer mines. After the federal government classified gold-mining as “nonessential” and gold mines as subject to closure in 1942, mining efforts shifted away from gold and toward the production of other “essential” minerals.” Production of placer gold in Alaska fell in 1941 and 1942. The value of the Kuskokwim Region’s output plummeted from \$1,270,000 in 1941 to \$505,000 in 1942. Smith concluded that “the placer camps in the Kuskokwim region, because of their remoteness, have probably felt the impact of the wartime restrictions more than the camps in any of the other productive regions.”¹⁴² Placer gold mining in the Arolik basin declined during the war and failed to recover after the war ended.

Following World War II, intermittent mining activity took place in the Arolik River drainage. For example, gold placer mining reportedly took place on Fox Creek as recently as 1953.¹⁴³ In the 1960s, the Goodnews Bay Mining Company prospected for platinum on Butte Creek.¹⁴⁴ In 1989, Calista Corporation—now a major landholder in southwest Alaska—produced a report on the mining potential of the Goodnews Bay gold district. The report listed three promising areas, one of which was the Kowkow Prospect (including Butte and Trail creeks) in the Arolik basin. Calista Corporation performed field mapping and sampling in the area in 1986 and 1987. Their report classified the Kowkow Prospect as a priority for Calista Corporation because of its “favorable location (proximity to tidewater), the placer gold occurrence, and complex geology.” The report also emphasized the ease with which the Kowkow Prospect could be accessed via the Arolik River. “The Arolik is navigable to river boats,” it stated, “and a tractor trail leads from the river to the prospect sites.”¹⁴⁵

The Arolik River served as a major summer supply route for prospectors and miners who engaged in small- and medium-scale gold mining activities in the Arolik River drainage during the first forty years of the twentieth century. A large portion of the equipment and supplies used by the miners was shipped in overland in winter by dog team. But until the late 1930s, the Arolik River served as the summer supply route for prospecting and mining operations located along the Arolik River and its tributaries between river mile 28 and river mile 34. In the late 1930s, miners began transporting heavy equipment and supplies over upland trails using caterpillar tractors during the summer months. Reed’s documentation of Frank V. Smith’s 1930 prospecting schedule indicates that prospectors moved their men, equipment, and supplies between prospecting sites on the Arolik River and its tributaries. Miners are known to have used boats sometimes to travel to and carry supplies to their mining sites. A 1931 photograph (Figure 17) of a boat was taken at a mining camp at the mouth of Fox Creek (river mile 31.4).

Native Use of the Arolik River Just Prior to Statehood

The people of Quinhagak made use of the resources of the Arolik River prior to 1930. In kayaks and oar boats, which they poled upriver, they traveled to seasonal camps where they engaged in fishing, hunting, trapping, and berry picking. Those subsistence activities changed gradually during the twentieth century in response to changing conditions and technology.

Between 1930 and 1954, subsistence was the predominant lifestyle, although a wider variety of economic opportunities became available to the people of Quinhagak. Some people harvested salmon for the canneries or worked in the canneries. Some herded reindeer, although the herds disappeared from the area by the 1940s. Cannery wages allowed people to purchase outboard motors, rifles, and ammunition. People used boats powered by outboard motors to travel from Quinhagak to their seasonal camps on the Arolik River. Native people continued to trade or sell dried salmon and furs.¹⁴⁶

Although Native people participated in the fur trade, they did not work for wages until the commercial fishery began toward the end of the nineteenth century. There were few opportunities for Native people to work in the canneries until World War II, when outside labor became scarce. Then, according to Wolfe, Alaska Natives were able to participate in both the processing and harvesting sectors of the commercial fishing industry. Processing crews were composed of all Natives after the war, and many of those harvesting fish for the canneries were Natives, as well.¹⁴⁷

The number of spring camps fell between the 1950s and the 1980s. Wolfe reported that as late as the early 1950s, Quinhagak parents took their children out of school to move upriver to squirrel camps. They later stopped the practice in response to tightened school attendance policies.¹⁴⁸

Between 1955 and 1979, commercial fishing produced disposable income that was used to purchase aluminum boats, outboard motors, snow machines, and travel by airplane. Kayaks, oar boats, and sail boats also continued to be used throughout this period. Although snowmachines were introduced as early as 1955, they did not begin to replace dog teams until the late 1960s and early 1970s. The use of snowmachines reduced the need to harvest large numbers of fish for use as dog-team “fuel,” but increased the need for cash with which to purchase fuel for snowmachines.¹⁴⁹

After World War II, the market for furs fluctuated and prices declined. As a result, less trapping was done for commercial sale in southwest Alaska.¹⁵⁰ This trend may have reduced the numbers of people traveling to spring camps and, consequently, the number of Native people who floated downriver from spring camps after break-up.

Specific information concerning use of the Arolik River by Native people during this period can be gleaned from Native allotment files. Many Native allotment holders stated that they had made use of land along the Arolik River prior to statehood.

Recent Use of the Arolik River Documented in Native Allotment Files

The BLM began collecting information in the 1970s to adjudicate Native allotment applications filed by local Natives from Quinhagak who have fished, hunted, trapped, and picked berries along the Arolik River. The Natives used power boats to access favorite spots along the river for those activities. Eventually these favorite spots developed into exclusive use areas. The federal government recognized many of these allotments and transferred title to the sites to the applicants. Twenty Native allotment applications were filed on the Arolik River and its tributaries in 1971. The parcels are located along the North Mouth and the lower two-thirds of the main stem Arolik River between river mile 0 and river mile 31.5, and along the South Mouth between river mile 0 and river mile 3. A few of the parcels are located away from the main channel, on sloughs or tributary rivers or creeks. All are within 20 miles of Quinhagak.

Of the 20 applicants who applied for Native allotments, 17 claimed use of their parcels during the open season, some starting as early as the 1940s. They traveled up the Arolik River to their allotments each year in small boats powered by outboard motors. Their use of their allotment parcels is described below.

North Mouth Arolik River

Most of the Native allotments along the Arolik River system are located on the lower half of the North Mouth Arolik River. They are clustered within two miles of the river's mouth and in the vicinity of the mouth of Bessie Creek, a right bank tributary that enters the North Mouth Arolik River at about river mile 9.5, in Sec. 29, T. 5 S., R. 73 W., SM. One allotment is located about five miles up Bessie Creek.

Four Native allotments are located on the right bank of the North Mouth Arolik River between river mile 0 and river mile 2.5. Sam Fox owns the parcel closest to the river's mouth, at river mile 0. His parcel AA-31296-C is located on the right bank of the North Mouth Arolik River at the river's mouth and on a nearby island in the river, in Sec. 33, T. 5 S., R. 74 W., SM. Mr. Fox began using the parcel in 1945 for subsistence activities.¹⁵¹ According to a BLM field report, the applicant used a boat to access the land each summer for duck hunting.¹⁵²

Sam Pleasant holds two parcels along this section of the river: AA-54954-B and AA-54954-C. Parcel B is located in Secs. 33 and 34, T. 5 S., R. 74 W., SM, at about river mile 1. Parcel C is located in Secs. 27 and 34, T. 5 S., R. 74 W., SM, at about river mile 1.5. Mr. Pleasant began using both parcels in 1950 for fishing and hunting. He also used Parcel B for berry picking.¹⁵³ In an affidavit signed on November 29, 1984, Mr. Pleasant said that he used all of the parcels of his allotment for berry-picking in the fall and subsistence fishing for trout and salmon in the spring. He said that he had begun doing so when he was about 12 or 16 years of age and had continued for more than 30 years.¹⁵⁴ Mr. Pleasant stated that he accessed both parcels by boat and snow machine.¹⁵⁵ Three men—Jesse Carter, Sr., Paul Beebe, and Robert D. Roberts—corroborated his claims of subsistence use of his parcels B and C, beginning in 1943. Mr. Carter said that in fall 1943, he hunted and trapped furbearers with Mr. Pleasant on his Parcels B and C.¹⁵⁶ In the winter of 1943, Paul Beebe first saw Mr. Pleasant on his Parcels B and C, which were good sites for trout fishing in winter. He also stated that Mr. Pleasant had a fall camp on his Parcel C, along with his late mother and his father. Mr. Beebe saw Mr. Pleasant hunt ducks and geese on his parcels B and C in spring 1943 and pick blackberries on both parcels in fall 1944.¹⁵⁷ Robert D. Roberts said that in April 1958, he hunted ducks and geese with Mr. Pleasant on his Parcel B. Roberts said that in the summer of 1958 he first saw Mr. Pleasant on his Parcel C, where he had a tent set up and was engaged in fishing.¹⁵⁸

Between Sam Pleasant's two parcels, Charlie Pleasant holds allotment AA-31290, which is located at river mile 1.2, on the right bank of the North Mouth Arolik River in Secs., 27, 28, 33, and 34, T. 5 S., R. 74 W., SM. Charlie Pleasant's application stated that he used his allotment for fishing and berry picking each year from August to October and

for hunting from November to July.¹⁵⁹ A BLM field report stated that he had used this allotment beginning in 1950 for seasonal subsistence activities—fishing, berry picking, and hunting. He accessed his allotment by boat. The field report noted the existence of an “old camp site” on the parcel.¹⁶⁰

Just upstream of Sam Pleasant’s Parcel B is the allotment of Charlie Fullmoon (deceased), FF-17541, which is located on a slough at river mile 2.5 in Secs. 26 and 27, T. 5 S., R. 74 W., SM. On his Native allotment application, Mr. Fullmoon stated that he had used the land continuously since 1912 for hunting muskrats in spring and rabbits in winter.¹⁶¹ A BLM field report filed in 1987 stated that Mr. Fullmoon accessed his allotment by boat and snow machine and used it for hunting, fishing, and berry picking.¹⁶² In an affidavit, James Fox stated that Mr. Fullmoon traveled on the North Mouth Arolik River to get to his allotment and used the site for fishing and for hunting birds in the open season and foxes in winter.¹⁶³ Quinhagak resident Willie Hill also said that he had traveled with Mr. Fullmoon to his Native allotment for subsistence hunting.¹⁶⁴ Sam Pleasant, Sr. said that he used to go to Mr. Fullmoon’s Native allotment and reported that during the spring season Mr. Fullmoon used a boat to access the site, where he fished for herring and hunted muskrats.¹⁶⁵

Six Native allotments are located farther upstream along the lower North Mouth Arolik River. Sam Carter has two parcels in that section of the river. Parcel AA-37760-A is located on the left bank of the river from river mile 4 to river mile 5, in Secs. 35 and 36, T. 5 S., R. 74 W., SM. A BLM field report filed in 1985 stated that Mr. Carter accessed Parcel A by boat. The field report noted that Mr. Carter claimed to have used the parcel seasonally for subsistence since 1950—from August to October for fishing and from November to June for hunting and trapping.¹⁶⁶ Mr. Carter has a second parcel that is located farther upriver.

Esau Moore, Sr. holds Native allotment AA-31289-B. Mr. Moore’s parcel is in Secs. 24 and 25, T. 5 S., R. 74 W., SM, north of the right bank of the North Mouth Arolik River in the vicinity of river mile 5.5 to river mile 6. Mr. Moore’s Native allotment application asserts that he used the tract since 1950 for seasonal subsistence activities. Fishing and hunting activities were cited for the period from August to October, and berry picking and trapping for December to June.¹⁶⁷ A BLM field report for AA-31289-B filed in 1984 stated that the applicant “has used this area for muskrat and bird hunting” since 1950. “Applicant would take a boat to the area,” the report said, “and remain there living in a tent.”¹⁶⁸

Paul Beebe holds Native allotment AA-37778-C, which is located in Secs. 24 and 25, T. 5 S., R. 74 W., SM, to the north of the right bank of the North Mouth Arolik River in the vicinity of river mile 6. This parcel is located adjacent to Esau Moore, Sr.’s allotment described above. Mr. Beebe’s Native allotment application claims that he had used the land from 1960 onward for seasonal subsistence hunting.¹⁶⁹ A BLM field report, which was filed on March 20, 1985, noted that access to the site was by boat and specified that

the parcel was used for hunting muskrats and birds. “He would take a boat to the area,” the report said, “live temporarily in a tent, then return to the village.”¹⁷⁰

Joseph Hunter holds Native allotment AA-37761-B, which is located on the left bank of the North Mouth Arolik River at river mile 7.5, in Sec. 31, T 5 S., R. 74 W., SM. In his allotment application filed on September 27, 1971, Mr. Hunter claimed use of the land seasonally for subsistence since 1950. He stated that he used the allotment from August to October for fishing, hunting, and berry picking; in November and December for trapping; and from December to July for fishing.¹⁷¹ According to a BLM field report, Mr. Hunter accessed the parcel by boat and “has a summer fish camp here.” The field examiner noted the presence of tent stakes on the site.¹⁷² In an August 10, 1982, letter to the Bureau of Indian Affairs, Mr. Hunter stated that he had begun using the land identified in his allotment application on November 15, 1928. He had based his claim on use of the land “for subsistence fish camp and squirell [*sic*] gathering camp.” This description of use pertained to two parcels, including Parcel B.¹⁷³

Charles Evans holds Native allotment AA-37765-B, which is located on a slough that runs parallel to the left bank of the North Mouth Arolik River at river mile 8.5, in Secs. 29 and 32, T. 5 S., R. 73 W., SM. When he filed his Native allotment application in 1971, Mr. Evans claimed use of the allotment parcel since 1950 for hunting, fishing, and berry picking from August to October, and for trapping, hunting, and fishing from November to July.¹⁷⁴ A BLM field report filed on March 11, 1985, stated that Mr. Evans accessed the parcel by boat for the purpose of picking berries and noted the presence of many berries in the area.¹⁷⁵

Sam Carter’s second parcel, AA-37760-B, is located from river mile 8.8 to river mile 9.4 in Sec. 29, T. 5 S., R. 73 W., SM. A BLM field report filed in 1985 noted that Mr. Carter accessed Parcel B by boat and had used the land seasonally since 1950 for subsistence fishing, hunting, and trapping.¹⁷⁶

Dan O. Kuku holds Native allotment AA-31275-C, which is located on both banks of the North Mouth Arolik River at the mouth of Bessie Creek, a right bank tributary. The allotment stretches along the river from approximately river mile 9.3 to river mile 9.8 in Secs. 29 and 32, T. 5 S., R. 73 W., SM. On his application, Mr. Kuku stated that he had used his allotment annually since 1950 for fishing, hunting and berry picking from August to October; for trapping in November and December; and for fishing and hunting from December to June.¹⁷⁷ A BLM field report described access to the site as “probably by riverboat.”¹⁷⁸

In addition to the ten allotments described above, which are on or near the North Mouth Arolik River, there is one Native allotment along the right bank of Bessie Creek, approximately five miles upstream from its juncture with the North Mouth Arolik River. Henry Matthew holds this allotment, AA-37773-B, which is located in Secs. 22, 23, 26, and 27, T. 5 S., R. 73 W., SM. In his Native allotment application, Mr. Matthew claimed use of the land since 1950. Specific subsistence uses were hunting, fishing, and berry

picking from August to October, and hunting and trapping in the winter months.¹⁷⁹ A BLM field report stated that the applicant gained access to this parcel by “boat in summer and snow machine in winter” and used the land for trapping. The BLM field examiner explained that the parcel encompasses “the end of the applicant’s trapline.”¹⁸⁰

Main Stem Arolik River

Five Native allotments (consisting of six parcels) are scattered along the lower half of the main stem Arolik River. Two additional parcels are situated approximately two miles south of the river, in the vicinity of Fox Creek, a left bank tributary. One of those parcels is owned by an allottee who has another parcel on the main stem Arolik River.

Moses Mark holds two parcels on the main stem Arolik River. Parcel AA-31274-C is located between river mile 22.1 and river mile 22.6, just upstream from the point at which the main stem Arolik River divides into the North and South mouths. Mr. Mark stated on his Native allotment application that he had used the parcels in his allotment since 1950 for subsistence fishing, hunting, trapping, and berry picking.¹⁸¹ A BLM field report stated that Mr. Mark accessed this parcel by snow machine and had used it since August 1950 for hunting rabbits and bear, trapping fox and otter, and fishing for salmon and trout.¹⁸²

Frank Matthew, Sr. holds Native allotment AA-37774-C, which is located near the left bank of the main stem Arolik River at river mile 22.7, in Sec. 32, T. 6 S., R. 72 W., SM. A BLM field report states that the tract is accessed by boat and used for “fishing, trapping, and hunting in the spring, summer, and fall.”¹⁸³ On his Native allotment application, Mr. Matthew claimed to have used the land from 1950 onward, for the purposes of berry picking, hunting, fishing, and trapping.¹⁸⁴

On January 13, 1988, BLM Natural Resource Specialist Susan DiPrete interviewed Frank Matthew, Sr. about his use of the Arolik River. DiPrete referenced Mr. Matthew’s Native allotment along the main stem Arolik River in Sec. 32, T. 6 S., R. 72 W., SM. His parcel in that section is AA-37774-C. DiPrete summarized Mr. Matthew’s testimony concerning his travels up the Arolik River in winter for the purpose of hunting squirrels in an area just to the east of his allotment. He told her that he travels to his Native allotment by dogsled or snowmobile, hauling his boat to use for the return trip downriver after break-up (in late April or early May). DiPrete wrote, “while the water is still high, he loads companions, gear, and his sled or snowmobile into his sixteen-foot Lund boat (a maneuverable, lightweight, aluminum, boat with an eighteen-horsepower outboard motor), and then either motors or rows downstream, taking the North Mouth as it is the only main channel.” Matthew mentioned that the practice of hauling a boat upriver to a winter/spring hunting and trapping camp for the purpose of floating downriver after break-up was used by other Quinhagak residents (including Moses Mark) who have Native allotments along the Arolik River and had been used by his father before him.¹⁸⁵ (Attachment 8) Moses Mark has Native allotment parcels at river mile 22.1-22.6 and at river mile 27.8-28. The practice that Mr. Matthew described is similar to the traditional use of skin boats for floating downriver from spring hunting camps, as documented in the

Phase IV report on the Kisaralik River and the Phase II-B report on the Kwethluk River.¹⁸⁶

Mr. Matthew holds a second parcel, AA-37774-D, which is nearly ten miles farther upstream in the mountains. A BLM field report filed in 1985 stated that Mr. Matthew used his Parcel D for spring squirrel hunting.¹⁸⁷

Willie Mark holds Native allotment AA-31273-D, which is located on the left bank of the main stem Arolik River from river mile 25.5 to river mile 25.8, in Sec. 4, T. 7 S., R. 72 W., SM. On his application, he claimed to have used the land since 1950 for seasonal subsistence fishing, hunting, picking berries, and trapping.¹⁸⁸ A BLM field report stated that access to the parcel was by boat and snow machine and that since 1950, the parcel had been used “for fishing humpies, trapping mink & fox, berry picking, hunting black bear.” The field examiner noted the existence of a cabin in poor condition and rotting away on the site.¹⁸⁹

James Williams (deceased) was the owner of Native allotment AA-37772-A, which is located on the left bank of a slough that enters the main stem Arolik River at about river mile 26. The parcel is located within Secs. 9 and 10, T. 7 S., R. 72 W., SM. It was certificated to Mr. Williams’ heirs in 1991. Mr. Williams applied for the allotment on September 29, 1971, claiming seasonal use of the land for fishing, hunting, trapping, and berry picking since 1950.¹⁹⁰ A BLM field report stated that the applicant accessed the tract by boat for the purposes of “trapping parka squirrels, trout fishing by net, picking berries, hunting brown bear in season.”¹⁹¹

Moses Mark has a second parcel, AA-31274-B, which is located on the main stem Arolik River in the mountains about five miles upriver from his parcel AA-31274-C. Parcel B is situated on the right bank from river mile 27.8 to river mile 28, opposite the mouth of Boulder Creek, a left bank tributary. The parcel is in Secs. 14 and 15, T. 7 S., R. 72 W., SM. In a deposition on May 1, 1985, Mr. Mark said that he used Parcel B for “trapping, ptarmigan hunting and also some fishing.” He noted that his Parcel A (not on the Arolik River) was his fishing camp. That is where he fished and smoked his catch in a smokehouse each summer and fall.¹⁹² A BLM field report of December 11, 1985, stated that access to Native allotment AA-31274-B is by snow trail and that the land is used for hunting rabbits, trapping beaver, and fishing for silver salmon and trout.¹⁹³ Frank Matthew, Sr. mentioned in a 1988 interview that Moses Mark also engaged in the practice of hauling a boat up the Arolik River by dog sled or snowmobile to a winter/spring hunting and trapping camp for the purpose of floating downriver after break-up.¹⁹⁴ Mr. Matthew did not specify whether Mr. Moses followed that practice at his Parcel C (located near the divergence of the North and South mouths) or at his Parcel B.

John Albert Sharp holds Native allotment AA-37771, which is located along the right bank of the main stem Arolik River from river mile 28.8 to river mile 30. It is located opposite the entry of left-bank tributary Faro Creek into the main stem Arolik River. The

allotment is in Secs. 14, 23, and 24, T. 7 S., R. 72 W., SM. On his Native allotment application, Mr. Sharp stated that he began using the land in 1965 for seasonal subsistence hunting that took place from August to October.¹⁹⁵ A BLM field report noted that access to the tract was “probably by riverboat.”¹⁹⁶

Two Native allotments are located about two miles south of the main stem Arolik River, in the vicinity of Fox Creek (river mile 31.4), a left bank tributary. Oscar Friendly holds Native allotment FF-17288, which is in Sec. 6, T. 8 S., R. 71 W., SM, and Secs. 1 and 12, T. 8 S., R. 72 W., SM. Mr. Friendly indicated on his Native allotment application that he had used the land seasonally since 1966 for subsistence trapping and hunting.¹⁹⁷ A BLM field report states that “the lands are claimed by the applicant for trapping and hunting for bear, moose, wolverine, fox and mink.” The examiner noted the presence of “tin sheets, barrels and boards” on the site—suggesting that the tract had been used in the past. The examiner also stated that he saw “evidence of mineral activity or potential on the parcel” and mentioned “the evidence of old mining camp litter at a campsite.”¹⁹⁸ The means of access to the allotment was not specified.

Frank Matthew, Sr. holds Native allotment AA-37774-D, which is located in Sec. 6, T. 8 S., R. 71 W., SM, just to the east of Mr. Friendly’s Native allotment described above. Mr. Matthew claimed use of his Native allotment parcels—of which AA-37774-D is one—since 1950.¹⁹⁹ This parcel is farther up the Arolik River (more than 30 river miles from the mouth of the North Mouth Arolik River) and farther from Quinhagak (approximately 20 miles) than any other Native allotment in the Arolik River System. A BLM field report stated that Mr. Matthew accessed this parcel by boat and used it in the spring for squirrel trapping and in the fall for fox and mink hunting.²⁰⁰ Since Mr. Matthew used this parcel for spring squirrel trapping and accessed it by boat, he might have hauled his 16-foot Lund up to the site with a dog team in winter and then after breakup floated downriver in the boat, with all of his gear on board, as he described in his 1988 interview with Susan DiPrete for his Parcel C.²⁰¹ Also in that interview, Mr. Matthew reported that Quinhagak residents did not commonly use jet boats or canoes on the Arolik River. Jet boats were too expensive to operate, and canoes could not transport a complete outfit to squirrel-hunting camp.²⁰² (Attachment 8)

South Mouth Arolik River

There are three Native allotments along the South Mouth Arolik River. Two are located between river mile 0 and river mile 1 of the South Mouth (within the tidal area) and the third is located on a slough to the south of the main channel at about river mile 3.

John Johnson holds Native allotment AA-37768-B, which is located on the left bank of the South Mouth Arolik River from river mile 0 to river mile 0.3. It is in Sec. 9, T. 6 S., R. 74 W., SM. Mr. Johnson’s Native allotment application, which was filed on September 27, 1971, claimed that he had used his parcels on a seasonal basis since 1950 for hunting, fishing, trapping, and berry picking. He indicated that he used his parcels for fishing, hunting, and berry picking from August to September, for fishing from December to June, and for trapping from November to December.²⁰³ A BLM field report

noted that Mr. Johnson accessed Parcel B by boat and had used the land since 1950 for the subsistence activities listed above.²⁰⁴

Carrie Cleveland holds Native allotment AA-31276-B, which is located along the right bank of the South Mouth Arolik River from about river mile 0.6 to river mile 1.0, in Secs. 9 and 10, T. 6 S., R. 74 W., SM. In her Native allotment application of September 27, 1971, Ms. Cleveland reported that she had used her allotment lands (including Parcel B) since 1950 for seasonal subsistence activities, including berry picking, hunting, and fishing. She also stated that she picked berries on her parcels from August to September and engaged in hunting and fishing from October to July.²⁰⁵ A BLM field report completed on October 15, 1985, indicated that access to the parcel was by boat and snow machine. The parcel had been used since 1950 for picking salmon berries and for duck hunting.²⁰⁶

Dan O. Kuku holds Native allotment AA-31275-B, which is located about one-half mile south of the South Mouth Arolik River on a slough at approximately river mile 3. This parcel is located in Secs. 10, 11, 14, and 15, T. 6 S., R. 74 W., SM. In his Native allotment application, which was filed on September 27, 1971, Mr. Kuku specified that he had used his allotment parcels seasonally for subsistence activities since 1950. He stated that he engaged in fishing, hunting, and berry picking from August to October; trapping from November to December; and fishing and hunting from December to June.²⁰⁷ A BLM field report that was filed on September 23, 1986, noted that access to the parcel was “probably by riverboat,” and that the applicant claimed to have used the parcel seasonally for subsistence.²⁰⁸

The Native allotments along the river represent continuous subsistence use for decades. They tie the subsistence practices of their owners’ generation to the subsistence way of life of previous generations. The allotment parcels were traditional sites for subsistence activities: fishing, hunting, trapping, and berry picking. In the past, hunting and trapping were part of the fur trade, and fish and furs were used as currency. The allotment holders accessed their parcels primarily by boat, although in winter they used snowmachines (dog teams in the past). Some individuals used snowmachines to access their allotments for hunting in late winter, hauling boats in which they would row or motor downriver after breakup. Such boats carried a heavy load, including the allotment holder and his companions, equipment, supplies, and furs. Native allotment holders used boats to motor back and forth between Quinhagak and their allotments on the North Mouth (to river mile 10), the main stem Arolik River (to at least river mile 30 and perhaps as far as river mile 31.4), and the South Mouth (to river mile 3). In addition, they rowed or motored downriver from allotments that were located as far up the Arolik as river mile 31.4.

Recent Native Use Documented in Subsistence Studies and Other Sources

This section covers approximately 55 years, from 1955 to 2009. It builds upon the information presented above and widens the discussion of Native use of the Arolik River

since statehood beyond uses associated with Native allotments. This section draws upon interviews conducted by the BLM and other government agencies, reports written by government researchers, and observations made by fishing and hunting guides. It offers additional details about the purposes for which Native people used the Arolik River and the water craft they used. BLM researchers noted in 2007 that, despite technological advances and increased participation in commercial fishing, Native people of southwest Alaska “still actively participate in a traditional way of life by hunting, fishing, gathering, and sharing traditional foods with their families, community and Elders.”²⁰⁹

In the period between 1955 and 1979, Quinhagak residents increased their involvement in commercial fishing. Income from commercial fishing enabled them to purchase aluminum boats and outboard motors. Those innovations made water travel more efficient than with traditional kayaks, oar boats, and sail boats, although those types of watercraft were still in use. Income from commercial fishing also made snowmachine purchases possible. The use of snowmachines at hunting camps made hunting more efficient and reduced the time spent in camp. One Native elder told researchers that “if the snow began to melt before they returned from spring camp, snowmachines would be loaded onto boats and floated back to the permanent villages or summer camps.” That description echoes the statement of Frank Matthew Sr. about his use of a snowmachine to haul his Lund boat to spring camp at his Native allotment on the Arolik River and his subsequent use of the boat to haul his snowmachine and other equipment back to Quinhagak. Snowmachines began to be used widely beginning in the late 1960s and early 1970s, replacing dog teams for winter travel. Previously, a substantial portion of subsistence fishing effort was devoted to catching and preserving fish for dog teams.²¹⁰ Now fewer fish needed to be harvested for dog team “fuel,” but snowmachine fuel needed to be purchased instead.

In 1984, anthropologist Robert Wolfe described the boats that were used by most Quinhagak fishermen as “aluminum or plywood skiffs, about 16 to 20 feet in length, with small outboard engines in the 35 to 75 hp range.” He said that the preferred make of boat was a “semi-V hull aluminum Lund...about 16 to 18-feet in length, with load capacities of about 1,500 to 2,000 pounds.” Aluminum skiffs began to replace wooden skiffs in the mid-1970s. The wooden skiffs had flat bottoms and varied in size. Some were long and narrow—3 ½ to 4 ½-feet wide and 18 to 21-feet long. Others were up to 9-feet wide and up to 24-feet long. The versatile shallow draft aluminum and wooden skiffs were used in both subsistence and commercial fishing. They performed well “in the mud flats and shoals at the mouth of the Kanektok and Arolik rivers.” Aluminum Lund skiffs were used for sea mammal hunting in Kuskokwim Bay, as well as for the freshwater fishing that took place upriver. In 1984, the aluminum boats sold for about \$3,000, making them affordable. The village corporation assisted fishers with boat purchases by requiring small down payments and “lenient monthly installments.”²¹¹

In 1984, Wolfe wrote that salmon represented 44 percent of subsistence output in Quinhagak, making it “the core resource in the economy.”²¹² Chinook, sockeye, chum, and coho salmon are abundant in the Arolik River drainage. Pink salmon are abundant in

the Arolik River during even-numbered years.²¹³ Salmon fishing occurs during the summer months, but other freshwater fish, such as rainbow trout, are harvested year round.

Quinhagak people net freshwater fish just before freeze-up in the fall and just after break-up in the spring. Throughout the winter and early spring, they jig for freshwater fish through holes in the river ice. Wolfe noted that Quinhagak people “most commonly harvest fish within about 15 to 20 miles of the community.”²¹⁴ They engage in ice fishing for rainbow trout and Dolly Varden on the North Mouth Arolik River from a favorite area just below the mouth of Bessie Creek to the river mouth. Round whitefish are harvested from the Arolik River, as well. Grayling are abundant in Bessie Creek.²¹⁵

Wolfe reported that traditionally subsistence foods were distributed and exchanged among villages “through lines of kinship and affiliation.” The subsistence resources flow from highly productive areas to areas that are less productive. For example, Quinhagak residents give trout to residents of Eek in return for such items as whitefish, pike, caribou, and moose.²¹⁶

Wolfe described a “coastal-inland shift” that occurred when Quinhagak residents became involved in commercial salmon fishing. The commercial fishery, which takes place in the ocean, draws subsistence salmon production toward the coast at the beginning of the season. Later, when the commercial harvest ends, people move upriver to traditional subsistence harvest locations, where they had spent a greater part of the summer in the past.²¹⁷

Quinhagak people have traditionally used and continue to use the Arolik River, as well as the Kanektok River, at various times of the year in their seasonal round of subsistence activities. Wolfe described a wide variety of subsistence activities, including those that take place at spring camps upriver. Many families traveled to such camps prior to the tightening of school attendance rules in the 1950s. In 1984, Wolfe found that, “Between the end of April and the end of May, about eight families travel to spring squirrel camps located in the mountain valleys above the Kanektok, Arolik, and Jacksmith rivers.” There they hunted or trapped squirrels, trapped wolverine and marmot, and hunted ptarmigan. The families returned to Quinhagak from spring camp by snowmachine, if there was adequate snow on the ground, or a relative traveled upriver by boat to pick them up. In the past, the furs of the squirrels they caught were sometimes sold internationally. Today they are sold locally. Wolfe reported that in 1984 the local price was \$150 per bundle of 45 skins untanned. Elaborate fur parkas, made of squirrel skins with calfskin trim, are regarded as “valuable prestige items” in that region.²¹⁸

Just after break-up in April, the Native people net large quantities of freshwater fish in the open water of the rivers and hunt migratory waterfowl. Salmon begin to arrive in late May and are harvested commercially and for subsistence purposes. Freshwater fish are harvested in summer, as well. Berry picking takes place in late summer and early fall. People pick salmonberries, raspberries, blueberries, and cranberries. In the fall, Native

hunters travel upriver again where they stay at traditional camps while hunting caribou, squirrels, brown bears, and beaver. Also in the fall, people hunt for migrating waterfowl, and a few individuals hunt for parka squirrels in the mountains. Before freeze-up, freshwater fish are netted on the rivers. In the winter, people jig through the ice for char, rainbow trout, round whitefish, and grayling. Jigging occurs most often on the Arolik and Kanektok rivers within 5-10 miles of Quinhagak, although there are jigging locations as far upriver as the mountains. Winter is a time for hunting and trapping furbearers and small game. A few people trap animals commercially. In February and March, hunting parties travel by snowmachine to the headwaters of the Arolik and other rivers to hunt for caribou.²¹⁹

In December, 1986, David Rukke, a BLM Realty Specialist, conducted interviews with Native people in Quinhagak for Group Survey No. 171, Quinhagak Village (Window 1562). None of the interviewees held Native allotments on any section of the Arolik River. Some of the interviewees estimated that it would be difficult or impossible to take propellered boats up the Arolik River. Alexie Pleasant, for example, noted that “Locals go up there by snowmachine in the winter only.”²²⁰ Joshua Cleveland said that for much of the year the North Mouth Arolik River is too shallow for an 18-foot boat with a 25-35 hp propeller outboard and a 1,000 pound load. However, such a boat and load could be taken upriver to the mountains in T. 7 S., R. 72 W., SM [river mile 27 to river mile 31.4], when the river is high in the spring. He explained that locals ascend the North Mouth Arolik River in jet boats or drift down the Arolik River in rafts that they put in at Arolik Lake. When the river is high in the spring, he said, Native allotment holders motor upriver to their claims in propellered boats for the purpose of fishing.²²¹ Julius Henry said that during high water in the spring, he had motored upriver halfway to the mountains in T. 7 S., R. 72 W., SM, in his 16-foot johnboat with outboard (propeller).²²² (Attachment 7)

A number of individuals told of Native people using their boats on the Arolik River during periods of high water in the fall to access hunting areas far upriver. In his description of subsistence activities of the Native people of Quinhagak, Wolfe stated that in the fall, Native hunters travel upriver to traditional camps where they stay while they hunt caribou, squirrels, brown bears, and beaver. Quinhagak residents Joshua Cleveland and Julius Henry told a BLM interviewer about this seasonal use of the Arolik River. In 1986, Joshua Cleveland said that in the fall, when rain storms raise the water level, villagers again travel up the river to their Native allotment claims in propellered boats.²²³ Julius Henry said that each fall he goes up the Arolik River with Ron Hyde, Jr., (of Alaska River Safaris) to trap, hunt, or fish.²²⁴ (Attachment 7) Mark D. Rutherford, an Arolik River guide, stated in 2007, that he “quite regularly” saw “various 18-foot outboard-powered Jet boats with hunters from Quinhagak. “When fall storms arrive in August,” he said, “caribou hunters run up the river in search of Caribou at least as far as the mouth of Keno Creek” [river mile 34]. He added that he had spoken with various Quinhagak hunters in that area.²²⁵ The hunters were probably seeking animals from the Mulchatna caribou herd, which ranges across a wide area that includes the Arolik River watershed.²²⁶ Rutherford said that when the river was particularly high after

exceptionally heavy rains one fall, “local hunters from Quinhagak were able to ascend by jet boat at least as far upriver as the confluence of the East and South forks” [river mile 37].²²⁷ (Attachment 28)

Two non-Native people who were interviewed by the BLM in 1986 provided observations regarding Native use of the South Mouth Arolik River. Jonie Snellgrove, a summer technician with the ADF&G in Quinhagak, said that in the fall of 1986 Native hunters traveled a short distance upriver at a tide. She was not aware of other boating activity on the South Mouth Arolik River.²²⁸ Sport-fishing operator Bill Lyle said, “the South Mouth Arolik is seldom navigated by resident (propeller) boats.”²²⁹ (Attachment 7)

The one-man kayak standard was in effect in 1988 when BLM Natural Resource Specialist Susan DiPrete conducted a second series of interviews on boat use on the Arolik River. Her interviewees referenced the use of a wider range of water craft (in terms of size and method of propulsion) than had the 1986 respondents. Chris Goll, who had operated as a hunting guide on the Arolik River for nearly a decade when he was interviewed in 1988, stated that during moose hunting season, he had observed Quinhagak villagers on the river using 15-foot powerboats that draw several feet of water. Goll mentioned that he had seen as many as ten boats of that type on the lower fifteen miles of the North Mouth Arolik River at one time.²³⁰ William Lyle, the operator of a sport fishing camp on Native lands along the North Mouth Arolik River near the mouth of Bessie Creek, told DiPrete that residents of Quinhagak “typically use prop boats while fishing and hunting along the river all summer, and even into October.”²³¹ (Attachment 8)

Even when water levels are low in July, people have been known to take boats upriver to the upper reaches of the main stem Arolik River. Fisheries biologist Rob MacDonald said that during a fish-sampling float trip in July 1996, he and his party were visited at their campsite in the mountainous area of the main stem Arolik River by three people who were motoring upriver in a skiff.²³²

Thus, Native people continue to use the Arolik River extensively during the open season. Using wooden or aluminum skiffs, they float downriver from spring camps (or are picked up by skiffs that motor upriver), they access Native allotment parcels for hunting, fishing, trapping, and berry picking, and they travel far upriver to reach hunting camps during periods of high water in the fall.

Government Studies of the Arolik River

During the last few decades, crews of fisheries researchers have rafted the Arolik River—from Arolik Lake to tidewater—for the purpose of gathering data on fish populations. Kenneth T. Alt was the first of them. In 1976, he surveyed the Arolik River for the Sport Fish Division of the ADF&G. From July 14 to 18, he floated down the river from Arolik Lake in a 12-foot rubber raft powered by a 4-hp motor. He reported that the boats used in

his stream surveys of 1975 and 1976 carried “sampling gear, fuel and camp gear, along with a crew of two or three biologists.”²³³ Alt and his crew flew with their gear to Arolik Lake in a float plane. From the lake, they descended the river in a raft, sampling fish along the way by means of angling and gill nets. They caught rainbow trout, lake trout, grayling, Arctic char, and pink, chum, red, king, and silver salmon. They also observed round whitefish in the river. In addition to rafting the East Fork, the main stem Arolik River, and the North Mouth, Alt explored on foot the lower half mile of the South Fork Arolik River. He surveyed Arolik Lake in 1975, as well as in 1976, and in both cases used a 12-foot rubber raft with 4-hp motor for the survey work.²³⁴

In 1991, R. Eric Minard and Dan O. Dunaway produced what they described as “the most complete and uniform summary of available size and age information yet to be published for wild rainbow trout stocks found in Southwest Alaska.” In the course of their study, they found that the Arolik River and its neighboring rivers in the western section of Southwest Alaska had been grossly underrepresented in fisheries research. Minard and Dunaway compiled data from the ADF&G Division of Sport Fish, the USFWS, National Park Service (NPS), University of Washington, and University of Alaska. In their examination of studies that had been conducted between 1954 and 1989, they analyzed more than 30,000 records, each representing an individual fish for which size and age statistics had been recorded. Only 25 of those 30,000 fish came from the Arolik River. They had been collected on July 16 and 17, 1976, by Kenneth Alt. Minard and Dunaway recommended that future sampling efforts in Southwest Alaska focus on those sections that had been neglected in the past, including the western section.²³⁵

In the 1990s, fisheries researchers working for USFWS, Togiak NWR, began to fill in the gaps that Minard and Dunaway had identified. Mark J. Lisac and Rob MacDonald gathered data on fish in the Arolik River. Between 1991 and 1994, they made six float trips on the Arolik River from Arolik Lake to tidewater for the purpose of studying rainbow trout. In 1996, MacDonald floated the Arolik River three times while gathering information on resident fish (including rainbow trout). In 1997, MacDonald and Lisac floated the Arolik River twice while studying resident fish populations. On other occasions, they floated various portions of the river. Their descriptions of those float trips provide important information about the use of the river for government research. In addition, Lisac and MacDonald sometimes mentioned encountering other boaters on the river.

Lisac and MacDonald accessed the river at Arolik Lake by float plane and used inflatable river rafts measuring 9 to 13-feet in length to descend the river. In 1991, their crew of three made one five-day float trip from August 1 to 5. During the following summer, Lisac and MacDonald made two float trips on the Arolik River. The first took place on June 25-30, 1992. It began at Arolik Lake and included the entire river to the mouth of the North Mouth Arolik River. The second trip, on July 11-14, began above the divergence of the North and South mouths. In 1993, Lisac and MacDonald floated the entire river, starting at Arolik Lake, from June 19-23. On July 19, they also made a one-day trip to the North Mouth Arolik River below Bessie Creek. In 1994, Lisac and

MacDonald descended the Arolik River three times. Their first trip occurred on June 16-20, the second on July 7-13, and the third on August 22-27. Those float trips enabled the researchers to sample a total of 1,000 rainbow trout from the Arolik River in four years.²³⁶

In 1996, Rob MacDonald made three float trips down the Arolik River for a study of resident fish. In his report, MacDonald provided day-by-day itineraries of the float trips. On each trip, MacDonald and his research team were flown in to Arolik Lake in a Grumman Goose operated by Fresh Water Adventures. The research crew consisted of four individuals on the first trip, five on the second, and three on the third. Togiak NWR Manager Aaron Archibeque made the first two trips, and Assistant Refuge Manager Donna Stovall joined the crew on the third trip. As they descended the river through the East Fork, the main stem, and the North Mouth, the researchers sampled rainbow trout, Arctic grayling, and char by means of hook and line and observed other fish species. Each trip represented four to five days on the river. A boat from Quinhagak picked them up near mouth of the North Mouth Arolik River and returned the researchers to Quinhagak. Willard Church and Albert Hunter operated the pick-up boat on two of the three trips.

The first trip of 1996 took place from June 21 to 26, the second from July 24 to 29, and the third from August 28 to September 1. The June trip proceeded without incident. On the July trip, however, the water in the East Fork was very low, and the party “had to drag over riffles and rocks the whole way.” At the end of their second day on the river, they camped at a point that was probably located within the eight-mile stretch (about river mile 26.5 to river mile 34.5) in which the river passes through the mountains. The following morning, as the researchers were breaking down their camp, Willard Church and two other men, who were heading upriver in a skiff, stopped at their camp to talk. On the last trip of the season, MacDonald and two others floated the Arolik River. MacDonald noted that, in the middle or lower section of the main stem Arolik River, a Lund skiff passed them as it traveled upstream. Also, they saw “2 weatherports 2 bends above Bessie Creek and a camp of 4 people with 1 raft at the straightaway above Bessie Creek.” At the end of their journey, they were picked up, as usual, by a boat from Quinhagak. But this time, a different boat and operator picked them up. The usual operators, Willard Church and Albert Hunter, passed them at the pick-up point on their way upriver with “2 clients they were taking up the Arolik.”²³⁷

In 1997, MacDonald and Lisac again collected data on resident fish of the Arolik River as part of a larger USFWS baseline study of age, weight, and length of resident fish species in Togiak NWR. MacDonald and Lisac made two six-day float trips down the Arolik River that summer with a crew of three each time. They floated the river on June 7-12 and on August 27-September 1. They put in at Arolik Lake and floated downriver from there, and MacDonald observed a dead chum salmon in the East Fork Arolik River on August 27, 1997.²³⁸

While some government researchers floated down the Arolik River, others motored up the river from the mouth. For example, in 1986, ADF&G employees Keith Schultz and Jonie Snellgrove told a BLM interviewer that they had taken their outboard motor (propeller) boats (12-foot & 15-foot, and 12-foot, respectively) up the North Mouth Arolik River as far as river mile 5.²³⁹ (Attachment 7)

Government researchers made at least a dozen float trips down the Arolik River between 1976 and 1997. Fishing guide Mark Rutherford said that among the “dozens of people” he knows who have used the Arolik River were USFWS researchers out of Togiak NWR and ADF&G researchers.²⁴⁰ (Attachment 28) Researchers floated the river—from Arolik Lake to tidewater—in rafts ranging in length from 9 to 13 feet. Each raft held two or more people, along with sufficient camping gear and equipment to support up to six days of fisheries research work on the river. The trips on the river were facilitated by commercial operators who flew the research teams in to Arolik Lake, picked them up by boat at the mouth of the river and transported them to Quinhagak, and then flew them from Quinhagak to their final destination. In their reports, the researchers described the high value of sport and subsistence fisheries of Southwest Alaska and the Togiak NWR. They emphasized the large size of Arolik River rainbow trout and grayling and commented on the limited fishing pressure that the Arolik River had seen relative to the nearby Kanektok and Goodnews rivers.²⁴¹

Commercial Travel on the Arolik River since Statehood

In addition to government travel for such purposes as fisheries research, other types of commercial travel have taken place on the Arolik River in connection with sport fishing and hunting guide services. Native and Non-Native people have been involved in commercial travel on the river, taking clients up and down the river in powerboats.

Fishing guides and their clients find the Arolik River attractive because it offers superior fishing experiences. The Arolik River’s rainbow trout stocks have been termed “world class,” and its rainbow trout sport fishery is the third largest in the Kuskokwim Bay area. Between 1997 and 2002, anglers caught an average of 1,122 fish on the Arolik River each year.²⁴² However, the Arolik River is significantly less crowded than other nearby rivers.

The Arolik River is known for the large size of its fish. Biologists Lisac and MacDonald reported that “Arolik River rainbow trout have a greater maximum length and a greater proportion of larger fish than the other Kuskokwim Bay drainage populations studied to date.” They classified the fish according to the following relative stock density categories (from smallest to largest): Stock, Quality, Preferred, Memorable, and Trophy. A sample of 1,000 rainbow trout from the Arolik River revealed that the Arolik River had a “greater proportion of rainbow trout larger than 500 mm (Memorable + Trophy)” than did the Kanektok or the Goodnews rivers. The researchers found that “Rainbow trout in the Arolik River were larger in length at age and have a greater maximum age, maximum

length and proportion of fish in the larger relative stock density categories than other western populations.”²⁴³ Other species were found to be large, as well. For example, Alt stated that all of the grayling that he took in the Arolik River in 1976 were large.²⁴⁴ Alaska West, which operates a commercial fly-fishing guide service on the Arolik River, claims that “there is no more beautiful rainbow than an Arolik rainbow.”²⁴⁵

The quality of the sport fishing experience on the Arolik River is enhanced by the fact that the river is not as crowded as other nearby rivers. In 1977, Alt reported “little evidence of past sport fishing utilization” and said that sport fishing on the Arolik River was done mainly by residents of Bethel and Dillingham.²⁴⁶ In 1995, Lisac and MacDonald stated that sport fishing pressure was substantially lower on the Arolik River than on the nearby Kanektok and Goodnews rivers. They cited Togiak NWR Special Use Permit files, in which guides reported an average of 158 client-use days per year on the Arolik River from 1986 to 1991, with a high of 324 client-use days in 1988. During that time sport fishing pressure on the Kanektok and Goodnews rivers was substantially higher. Each year, the Kanektok saw 5,000 angler days of use, while the Goodnews River had 2,500. Lisac and MacDonald described the Arolik River rainbow trout population as healthy and said that “angling and subsistence effort is still relatively low compared to other fisheries.”²⁴⁷ Keith Schultz, an ADF&G biologist, said in a 1986 interview that the Arolik River was not crowded like the Kanektok River.²⁴⁸ (Attachment 7) Alaska West tells prospective clients that the lack of development along the Arolik River contributes to the quality of the fishing experience.²⁴⁹

In 1986 and 1988, sport fishing and hunting guides told BLM interviewers about commercial uses of the Arolik River. The North Mouth was the center of much of this activity. In 1986, commercial sport fishing operator Bill Lyle maintained a sport fishing camp on the North Mouth Arolik River just above the mouth of Bessie Creek (river mile 9.5). He used 16-foot jet boats to transport clients up to his camp and to fishing areas in the clear water farther up the North Mouth Arolik River. Lyle also reported taking his jet boat upriver in high water past the divergence of the North and South mouths (river mile 22).²⁵⁰ Chuck Wade, who had floated down the river, said that he had observed the camp of commercial sport fishing operator Gohn Fishing just above the mouth of Bessie Creek (river mile 9.5).²⁵¹ (Attachment 7) Arolik River guide Mark Rutherford said that while floating the river with clients, he sees “other people in watercraft on every trip,” including “1-2 jet boats per day on the lower river.”²⁵² (Attachment 28)

A number of interviewees told of taking power boats up the main stem Arolik River in connection with guiding operations. Bill Lyle reported that in the summer of 1986 he had taken a 16-foot jet boat to the mountains in T. 7 S., R. 72 W., SM. The mountains in that township extend along the river between river mile 27 and river mile 31.4. Lyle conducted his fishing operation during June and July and into mid-August when water levels permitted.²⁵³ Rafter Chuck Wade stated that, after leaving the mountains on his way downriver, he had encountered a 16-foot jet boat operated by Gohn Fishing that was taking a sport fishing party to the mountains in T. 7 S., R. 72 W., SM. Wade did not

identify precisely where he saw the Gohn Fishing boat, but it was likely between river mile 22 and river mile 27, since he noted that he had left the mountains (river mile 27) but did not mention having passed the divergence point of the North and South mouths (river mile 22).²⁵⁴ (Attachment 7)

On January 19, 1988, Chris Goll, a hunting guide with eight years of experience on the Arolik River, told BLM interviewer Susan DiPrete that he had taken a 15-foot boat with a jet unit upriver “well beyond” the divergence of the North and South mouths while fishing during the summer. He reported that during periods of low water in late fall some stretches of the river are less than a foot deep, but at other times of year, the river is several feet deep and can accommodate 15-foot powerboats. Goll told DiPrete that he considered the river to be “certainly navigable by, and even practical for, such boats, rafts, and canoes, during ordinary high water.”²⁵⁵ DiPrete also interviewed William Lyle, a commercial guide who had operated a sport fishing camp for five years, “on Native lands along the North Mouth Arolik River near the confluence of Bessie Creek.” Lyle told DiPrete that, during a normal operating season (from June 20 to mid-August), he took a total of about fifty clients (in groups of up to six per week) upriver to the mountains at the eastern edge of T. 7 S., R. 72 W., SM, (river mile 31.4). He used 18-foot, flat-bottomed boats equipped with jet units, although he said that jet units are not needed in that portion of the river.²⁵⁶ (Attachment 8) It is not known whether the commercial operators who were interviewed by the BLM actually went upriver only as far as the eastern edge of T. 7 S., R. 72 W., SM or whether that was the limit of the BLM’s interest, as it represented the eastern extent of the selection area.

Alaska West operates daily guided fishing trips on the Arolik River during the summer months, sending two to three boats out on the river daily, with as many as six anglers per day. Guests stay at the Alaska West tent camp on the Kanektok River. Clients who opt to fish the Arolik River take a bus ride through the village of Quinhagak and down the Arolik Road, which extends almost to the bank of the Arolik River, where the Alaska West guide boats are kept.²⁵⁷ In 2007, Mark Rutherford stated that Alaska West used two jet boats to run day trips for fly fishermen up the Arolik River. He said that he knew of two guides who operated out of Alaska West’s camp, running clients upriver “essentially everyday from July 1-August 30.”²⁵⁸ (Attachment 28) Alaska West is part of Deneki Outdoors, a company that operates fly-fishing lodges in Canada, the Bahamas, and Chile, in addition to Alaska.²⁵⁹

Alaska Native individuals and organizations are involved in a number of commercial ventures on the Arolik River. In 1986, rafter Chuck Wade told a BLM interviewer that on a float trip down the Arolik River, his party encountered a commercial sport fishing outfitter, Gohn Fishing, which was using a 16-foot jet boat to reach the mountain in T. 7 S., R. 72 W., SM [river mile 27 to river mile 31.4]. Wade said that Gohn Fishing, which operated a camp on the North Mouth Arolik River just above the mouth of Bessie Creek, “claimed to have an agreement with the Native corporation to manage the lands. They were not to let anyone else use the river.”²⁶⁰ (Attachment 7) In 1988, Chris Goll told another BLM interviewer that sport fishing guide W. R. Lyle had a lease with a local

Native corporation to use the Arolik River commercially.²⁶¹ (Attachment 8) DiPrete interviewed William Lyle and stated that “for the past five years, Lyle has operated a sport fishing camp on Native lands along the North Mouth Arolik River near the confluence of Bessie Creek.”²⁶² (Attachment 8) Alaska West has conducted its sport-fishing business through partnerships with Qanirtuuq, Inc. and the Coastal Villages Region Fund (CVRF).²⁶³

The CVRF, an organization of 20 Yukon/Kuskokwim Delta Native communities, has held a substantial interest in commercial sport fishing on the Arolik River. The CVRF originated in 1992 as the Western Alaska Community Development Quota (CDQ) program. In 2000, the CVRF established Coastal Villages Angler, LLC (CVA) as a holding company for investments in the sport fishing industry. CVA acquired a one-third interest in Arolik River Sportfishing LLC, which owned and operated a fishing lodge in Quinhagak. In its annual report for 2000, the CVRF characterized the Arolik River Guiding Service as a “highly successful” new investment that had posted a profit during its first year of operation. Its early success was attributed to the managing partner’s “long history of sport fish lodges and guiding, investment by the Quinhagak village corporation, and unparalleled sport fish values on the Arolik River.”²⁶⁴ The Arolik River sportfishing lodge provided local employment and revenue to CVRF and Qanirtuuq, Inc.²⁶⁵ According to *Alaska Magazine*, Alaska West owner Andrew Bennett purchased the guided sport fishing business on the Kanektok and Arolik rivers in 2004.²⁶⁶

Some Native people from Quinhagak operate pickup services for rafters at the mouth of the North Mouth Arolik River and some offer guiding services on the river. PaPa Bear Adventures of Bethel, a commercial service provider for rafters who float the river, advises rafters that they can expect to pay a \$50 per-person pickup charge directly to the boat operator who picks them up at the river mouth and transports them to Quinhagak.²⁶⁷ Willard Church and Albert Hunter picked up fisheries researchers Mark Lisac and Rob MacDonald following two of their research trips down the Arolik River in 1996. At the end of their third trip that season, MacDonald said that Church and Hunter had stopped and visited the researchers at their camp near the river mouth before continuing up the Arolik River with some clients.²⁶⁸ On an ADF&G Waterbody Use and Observation Questionnaire completed in 1996, Carl L. Williams of Bethel stated that Willard Church and Teddy Roberts of Quinhagak “guide occasional clients on the [Arolik] river.”²⁶⁹ (Attachment 29)

In the 1980s, sport fishing operators regularly went upriver at least as far as river mile 31.4, taking dozens of clients each year in power boats with jet units. Commercial sport fishing ventures, such as Alaska West, continue to operate on the Arolik River.

Recreational and Commercial Rafting on the Arolik River

In addition to commercial boating up and down the river, recreational and commercial rafting takes place on the Arolik River. Rafters float the river for a variety of purposes,

including guided fly-fishing, wildlife photography, and wilderness camping. Rafting in remote areas such as the Arolik River basin involves guides, outfitters, and fly-in and pick-up services. Most float trips of the Arolik River begin with a drop-off flight to Arolik Lake, where the rafters, rafts, and equipment are unloaded. Each raft transports two or more people and the equipment and supplies required for a trip of several days to a week or more on the river. The 49-mile-long trip takes them down the East Fork Arolik River, the main stem, and the North Mouth to tidewater. One guide offers float trips from the South Fork Arolik River to tidewater. No documentation was found of any rafting activity on the South Mouth Arolik River.

Non-Natives have floated the Arolik River since at least 1975. On September 18, 1975, Ed Swanson, president of Knik Kanoers & Kayakers, wrote to Dick Thompson, BLM Associate State Director, in support of easements on rivers flowing through lands that were potential Native corporation selections. Swanson provided a list of rivers that members of his recreational-paddling organization had used or that were known to have been used by others for recreational boating, fishing, or float trips. “It would be tragic,” Swanson wrote, “if these rivers were to be left without easements and thus virtually closed to future public use.” Swanson included the Arolik River on the list of affected rivers and said, “Ray Baxter has run it and knows of two parties that traveled it this summer.”²⁷⁰ (Attachment 30)

On August 26, 1985, historian Dale Stirling interviewed professional guide Chris Goll concerning his use of the Arolik River. Goll said that he had guided clients on hunting and fishing float trips on the river every year since 1975. He and his clients drifted in inflatables from Arolik Lake to his camp 20 miles downriver. There they were picked up by aircraft that landed adjacent to the Arolik River. Goll stated that he used the river mostly during May and September, with lesser use from June through August and in October.²⁷¹ (Attachment 31)

Chuck Wade told BLM interviewer David Rukke about his first float trip down the Arolik River in July 1986. His party of seven used three rafts to float the river from Arolik Lake to tidewater.²⁷² (Attachment 7) In a 1988 interview with Susan DiPrete, hunting guide Chris Goll of Rainbow River Lodge said that seasonal shallowness of the East Fork does not deter river rafters. Even in late fall, when the river is at its lowest point, he had taken bear hunting clients on float trips from Arolik Lake to tidewater.²⁷³ (Attachment 8) In 1988, William Lyle told BLM interviewer Susan DiPrete that in addition to his trips upriver, he had rafted down the river from Arolik Lake to tidewater.²⁷⁴ (Attachment 8)

Glenn Paul Martin from Bethel completed a Waterbody Use and Observation Questionnaire in which he described a float trip that he took down the Arolik River from Arolik Lake in June/July, 1995. His party of four people used two rafts. He also stated that he knows several people who have floated the entire length of the Arolik River. He traveled from the mouth of the river to Quinhagak in an 18-foot Lund with 40 hp jet.²⁷⁵ (Attachment 32)

Fresh Water Adventures, Inc. of Dillingham has offered float trips on the Arolik River.²⁷⁶ The company also offers drop-off flights for Arolik River rafters to Arolik Lake in a Grumman Goose amphibious plane. In 1996, fisheries researchers Lisac and MacDonald used Fresh Water Adventures' drop-off service.²⁷⁷

On February 16, 2007, Mark D. Rutherford, of Burton, Washington, completed an ADF&G Waterbody Use and Observation Questionnaire concerning his use of the Arolik River, including the lower section of the South Fork and the East Fork from the outlet of Arolik Lake to tidewater. Rutherford said that he had first floated the East Fork from Arolik Lake in 2002, with Richard Voss, manager of the Arctic National Wildlife Refuge. He stated that he had first floated the South Fork Arolik River in August 2003 with Voss. When floating the river from the South Fork, Rutherford puts his raft in at the mouth of Crater Creek, a right-bank tributary at about river mile 4.7 of the South Fork—at the northern edge of Sec. 34, T. 8 S., R. 71 W., SM.²⁷⁸ Rutherford stated that he takes clients on week-long guided fly-fishing float trips down the South Fork once or twice each summer. He made one trip in 2004, three in 2005, and two in 2006. According to his website, Rutherford's company, Wild River Guides, took clients on two fly-fishing float trips down the South Fork Arolik River in 2007, one in 2008, and one in 2009.²⁷⁹ During those trips, Rutherford and his clients pursued a variety of activities, including “guided fly-fishing, rafting, wildlife photography, and wilderness camping.” He used two air taxi services to access the South Fork Arolik River: Tikchik AirVentures and Bay Air (both headquartered in Dillingham). He arranged for pickup either by floatplane or from the beach at the river mouth. Rutherford said that he used 10-foot to 16-foot inflatable rafts with inflatable floors (Aire, Outcast, NRS, or Sotar brands). The rafts were propelled by oars. Rutherford also said that he knows “dozens of people” who have used the Arolik River, including “several fly fishermen from Fairbanks float it every year.”²⁸⁰ (Attachment 28)

Testimony from Arolik River rafters Chuck Wade, Chris Goll, and William Lyle figured prominently in a navigable waters memorandum of March 29, 1988, in which Robert W. Arndorfer, BLM Deputy State Director for Conveyance Management, determined two small sections of the Arolik River to be navigable. Arndorfer cited Wade's statement that he had “accompanied a six-person party in three rafts from the lake during the summer of 1986” and considered “the river suitable for such crafts during ordinary high water.” Arndorfer stated that Chris Goll “has floated from the lake to tidewater during late fall while guiding bear hunts” and “said the river will generally float a raft at that time of year when it is at its lowest.” He noted that Lyle had “floated the river from the lake to tidewater.” In summary, Arndorfer said, “three individuals with experience on the upper river all indicate that it is suitable for canoe navigation in this stretch and beyond during ordinary high water.” In determining the North Mouth Arolik River navigable in Sec. 9, T. 6 S., R. 73 W., SM, Arndorfer said, “Guides Chris Goll and William Lyle have clearly demonstrated the river's capacity for small craft navigation by their recent float trips.”²⁸¹ (Attachment 9)

Recreational rafting on the Arolik River depends upon commercial service providers because of the river's remoteness and lack of roads. Most of those who raft the river are flown in to Arolik Lake. After floating down the river for several days, they are picked up by boat from points near the river mouth and transported to Quinhagak for a fee. Some rafters are accompanied by a guide on the trip downriver or rent equipment from outfitters who also handle logistics. Bay Air Alaska of Dillingham, for example, offers fishing float trips of the Arolik River, schedules roundtrip air travel, and rents rafts and gear.²⁸² PaPa Bear Adventures of Bethel offers float fishing trips on the Arolik River. Their equipment pricelist includes rafts and accessories, tents, kitchen kits, tarps, dry bags, cots, roll up tables, folding chairs, etc. They recommend allotting five to seven days for the trip down the Arolik River from the drop off point on Arolik Lake. According to this firm, floaters are picked up near the river's mouth by ground transportation and taken to the Quinhagak airport, where they board an airplane to Bethel. Cost of the water transportation from the Arolik River to Quinhagak airport is \$50, which is paid directly to the driver.²⁸³ Tikchik AirVentures of Dillingham provides air transportation to rafters, as well as rentals of rafts and camp equipment.²⁸⁴

In 2007, the BLM issued the "Bay Proposed Resource Management Plan and Final Environmental Impact Statement" for lands in southwestern Alaska that include the Arolik River drainage. That document described the major rivers in the planning area as "important transportation routes" year round. "During the ice-free months," it said, "private and commercial boats from villages and lodges utilize navigable waterways to access rich hunting and fishing areas throughout the watersheds for subsistence and recreation."²⁸⁵ With the addition of mining transportation, the uses cited in the BLM study are the historical and current uses of the Arolik River.

VI. Summary

Over the years, the BLM has made a number of navigability determinations on portions of the Arolik River. In 1979, the BLM determined the Arolik River to be non-navigable in the Quinhagak village selection area. In 1988, the BLM determined the first 2.5 miles of the North Mouth to be tidal and the first 3.2 miles of the South Mouth to be tidal. At the same time, the BLM determined that the North Mouth Arolik River was navigable in Sec. 9, T. 6 S., R. 73 W., SM, and the main stem was navigable in Sec. 24, T. 7 S., R. 72 W., SM. The agency used the one-person kayak standard and new evidence that had not been available in 1979, including NASA photographs (1982 and 1984), C. Michael Brown's regional report (1985), and interviews that the BLM had conducted regarding use of the river (1986 and 1988). In 2006, BLM officials reconsidered the navigability of the river and reversed the navigability determinations of 1988. The agency cited the decision of November 15, 1979, which had determined the Arolik River to be non-navigable in the Quinhagak village selection area, and stated that, since that decision had not been appealed, "it was considered final for the entire water body within the report area" (including the two portions that had not been part of the November 15, 1979, decision and were determined navigable in 1988).²⁸⁶ Although the

Decision to Interim Convey determined the river as non-navigable, the Natives were not charged acreage for the submerged lands. During survey, the Arolik River was meandered and segregated throughout the selection area. The submerged lands were not included in the patents.

The State's position is "that the combination of historical evidence of travel, trade, and commerce along the waterway and evidence of susceptibility to navigation clearly demonstrate that the Arolik River is navigable" and that the river bed is owned by the State.²⁸⁷ (Attachment 25)

The Arolik River has no whitewater or obstructions as it meanders 50 miles from the Ahklun Mountains to the sea. Water levels range from a few inches to a few feet and fluctuate during the summer, with the highest levels occurring early and late in the season. The entire river can be floated in inflatable rafts, from Arolik Lake to the mouth of the North Mouth Arolik River. Users have reported that power boats (especially boats with jet units, but also propeller boats) can travel as far upriver as river mile 31.4. During high water in the fall, power boats with hunters on board have been seen as far upriver as river mile 34, and—in flood conditions—as far as the confluence of the East and South forks (river mile 37).

There were three major types of use of the Arolik River during the historic period prior to statehood. The first type of use prior to statehood involved Native people floating down the river after spring hunts in the mountains. Native people used dog teams (later snowmachines) to tow their boats, equipment, and supplies to their camps. Parka squirrels, and other animals, were sought in these hunts. The skins were often traded, and there was an international component to the squirrel skin trade. After break-up, the hunters loaded their snowmachines into their skiffs, along with people, equipment, meat, and skins, and then floated or motored downriver from the middle or upper reaches of the main stem through the North Mouth to Kuskokwim Bay and back to Quinhagak. Although the number of people participating in spring squirrel hunts declined after the 1950s as a result of school attendance policies, the practice of floating down the Arolik River from spring camps or motoring upriver to retrieve people from spring camps continued at least into the 1980s, as reported by Wolfe in 1984 and by Frank Matthew in 1988.

The second type of use prior to statehood involved miners using the Arolik River as a summer transportation route between 1900 and World War II. In 1921, Harrington listed two routes by which supplies were shipped from Quinhagak to the Arolik Basin gold mining area: by poling boat in the summer or by dog sled in winter and early spring. In 1931, Reed said that equipment and most supplies bound for the gold fields in the Arolik River area were shipped overland in winter from Quinhagak, while accessory supplies were shipped in by poling boat up the Arolik. He also stated that outboard motorboats were able to ascend the river as far as the mouth of Faro Creek (river mile 29.5) during periods of high water. He believed that even if future overland routes were constructed for freighting heavy equipment, poling boats and outboard motorboats would continue to

be used for light supplies and perishables. In the late 1930s, miners began using a summer route from Goodnews Bay to the Arolik basin to freight equipment and supplies using a caterpillar tractor. From that time on, most supplies and equipment have been taken to the mines overland or by airplane. The relative proportions of materials that were shipped overland or by boat up the Arolik River from the 1900s through the 1930s are unknown. Calista Corporation, which has been promoting mining in the Arolik basin, stated in 1989 that the Arolik River was navigable to river boats and that a tractor trail led from the river to prospect sites on tributaries of Faro Creek.

The third type of use prior to statehood involved local Natives ascending the river in boats with outboard motors each year during spring, summer, and fall for the purpose of accessing exclusive use areas (later identified as Native allotments), where resources were seasonally abundant. Those locations were along the North Mouth and main stem Arolik River between river mile 0 and river mile 31.4 and on the South Mouth Arolik River between river mile 0 and river mile 3. In the 1950s and earlier, the Native people engaged in traditional subsistence activities—fishing, hunting, trapping, and berry picking—at those sites during the open season.

There have been three major types of use of the Arolik River since statehood. The first type of use since statehood involves Native people from Quinhagak traveling up the North Mouth Arolik River, the main stem, and the South Mouth in wooden or aluminum skiffs with outboard motors to use their Native allotments for subsistence fishing, hunting, trapping, and berry picking. The Native allotments are located between river mile 0 of the North Mouth and river mile 31.4 of the main stem, and along the South Mouth between river mile 0 and river mile 3. In the fall when rainstorms raise the water level, Native caribou hunters have traveled even farther upriver by boat for caribou hunting—through the North Mouth and into the upper main stem, as far as river mile 34 during periods of ordinary high water that occur in the fall and to river mile 37 during flood conditions.

The second type of use since statehood involves federal and state government sponsored float and power boat trips to study the river's physical characteristics and fish populations. Kenneth Alt, the first researcher to study the Arolik River, floated the river in 1976. Other scientific parties of three or more people each made at least a dozen float trips down the river during the 1990s. The researchers studied fish populations as they floated in rafts 9 to 13-feet long from Arolik Lake through the East Fork, main stem, and North Mouth to tidewater. The float trips lasted up to six days. The researchers used commercial drop-off services at Arolik Lake and pick-up services at the river mouth.

The third type of use since statehood involves guided and unguided recreational use of the Arolik River, using power boats or rafts. Sport fishing accounts for most of this use, although there are other types of recreational use, including hunting, wildlife viewing, photography, and wilderness camping. In the 1980s, commercial operators told BLM interviewers that they used 15-foot, 16-foot, and 18-foot jet boats to take clients to fishing areas on the North Mouth Arolik and on the main stem as far upriver as the mountains at

the eastern edge of T. 7 S., R. 72 W., SM (river mile 31.4). Guide services made daily trips upriver with clients during the summer months. Some clients engaged in hunting, wildlife viewing, or photography, as well as sport fishing. Some commercial operators arranged with the Native corporations to operate base camps on Native lands along the North Mouth Arolik River in the vicinity of the mouth of Bessie Creek, from which they took clients upriver to fishing areas. Others entered into partnerships with Native corporations or other Native organizations. Some Native people from Quinhagak have offered pick-up services for rafters or have guided clients on the Arolik River. Guided or unguided raft trips are made for the purposes of recreational sport fishing, wildlife viewing, photography, and wilderness camping. Raft trips down the Arolik began as early as 1975 and have continued to the present day. Typically, rafters are dropped off by a float plane at Arolik Lake and float down the East Fork, main stem, and North Mouth to tidewater. One guiding service offers float trips that begin at a point several miles up the South Fork and involve floating down the South Fork, the main stem, and the North Mouth to tidewater. The Arolik River's remoteness and lack of road access have created a market for the services of commercial outfitters, who offer guiding services, drop-off and pick-up services, equipment rentals, and logistical support to rafters.

Further research has the potential to uncover additional information about uses of the Arolik River. The files of the state and federal agencies that exercise management responsibilities in the area are likely to contain documentation about use of the river. For example, Togiak NWR files could be examined for field crew trip notes and reports. In 1998, fisheries researchers MacDonald and Lisac referred to "an extensive field program" of the USFWS that focused on the major waterways of the Togiak NWR. The program involved survey trips that have been made since 1984 for the purpose of gathering data on the fisheries resource.²⁸⁸ Additional information could be sought from commercial and recreational users of the river, through published and unpublished narratives and photographs. Memoirs of miners and archival sources on individual miners and mining companies could yield specific information about historical use of the Arolik River prior to statehood. Sources on mining interest and prospecting over the course of the last six decades could contribute additional information regarding recent use. Data on traditional Native uses of the river would also be valuable, such as material from Moravian Church files on population movements and subsistence activities, as well as archaeological information concerning the pre-twentieth century settlements along the Arolik River.

Endnotes

¹ Kenneth T. Alt, *Inventory and Cataloging of Sport Fish and Sport Fish Waters of Western Alaska*, Volume 18, July 1, 1976 - June 30, 1977, Juneau: Sport Fish Division, Alaska Department of Fish and Game, 1977, p. 47.

² GIS calculation of river length using the National Hydrography Data Set derived from U.S. Geological Survey quadrangle maps.

³ Alt, *Inventory and Cataloging Western Alaska Waters*, pp. 47, 50.

⁴ Donald J. Orth, *Dictionary of Alaska Placenames*. Geological Survey Professional Paper 506. United States Geological Survey, Washington, D.C.: U.S. Government Printing Office, 1971, p. 87.

-
- ⁵ C. Michael Brown, *Alaska's Kuskokwim River Region: A History*. Anchorage, Alaska: Bureau of Land Management State Office, 1985, p. 217; Alaska Community Database, Community Information Summaries (CIS) for Quinhagak, at <http://www.commerce.state.ak.us/dca/commdb/CIS.cfm> (6/15/09).
- ⁶ Orth, *Dictionary of Alaska Placenames*, p. 87.
- ⁷ Alden M. Rollins, compiler, *Census Alaska: Numbers of Inhabitants, 1792-1970*, Anchorage: University of Alaska Anchorage Library, 1978, p. 1890-9, 1900-6.
- ⁸ Stanley H. Bronczyk, Realty Specialist, Easement Task Force Meeting on Quinhagak, February 1, 1977, BLM files, F-14885-EE.
- ⁹ Ibid.
- ¹⁰ Robert O. Pickering, Navigable Waters within Village Selections, March 10, 1977, BLM files, 9185.5 (922).
- ¹¹ Curtis McVee, BLM State Director (SD), Memorandum re Final Easements for the Village of Quinhagak, October 25, 1979, BLM files, F-14885-EE.
- ¹² Sue A. Wolf, Chief, BLM Branch of Adjudication, Decision on Section 14(h)(1) Application Rejected in Entirety, Lands Proper for Village Selection Approved for Interim Conveyance or Patent, November 15, 1979, BLM files, F-14885-A.
- ¹³ Ibid.
- ¹⁴ Robert D. Arnold, Assistant to the State Director, ANCSA, Interim Conveyance Nos. 342 and 343, June 25, 1980, BLM files, F-14885-A.
- ¹⁵ U.S. Survey No. 9688, Officially Filed August 13, 1990, Lots 2 and 3 represent Native Allotment AA-031275C, Certification 50-91-0293.
- ¹⁶ David Rukke, Realty Specialist, Interviews for Group Survey No. 171, Quinhagak Village (Window 1562), December 19, 1986, BLM files, F-14885-EE.
- ¹⁷ Susan Di Prete, Natural Resource Specialist, Interviews for Group Survey 171 (Quinhagak), January 27, 1988, BLM files, F-14885-EE.
- ¹⁸ Robert W. Arndorfer, Deputy State Director for Conveyance Management, Memorandum on Navigable Waters in Group Survey 171 (Window 1562), March 29, 1988, BLM files, F-14885.
- ¹⁹ Ibid.
- ²⁰ Ibid.
- ²¹ Sandra Dunn, Assistant District Manager, Lands, Final Easement Recommendations for Lands to be Conveyed to Calista Corporation, December 1, 1993, BLM files, AA-70153-EE.
- ²² Robert Lloyd, Assistant District Manager, Lands Division (041), Final Easement Review and Patent Easement Memorandum for Selected Lands and Lands Conveyed by Interim Conveyance Nos. 342 and 978, to Qanirtuuq Incorporated, July 7, 1994, BLM files, F-14885-EE.
- ²³ Heather Coats, Land Law Examiner, Intent to Issue Patent Notice, April 6, 1995, BLM files, F-14885-EE.
- ²⁴ Patent Nos. 50-95-0284 and 50-95-0285; corrected Patent Nos. 50-2006-0296 and 50-2006-0297.
- ²⁵ U.S. Rectangular surveys.
- ²⁶ Three historical MTPs of the South Mouth Arolik River, 1980 and 1994.
- ²⁷ Allyson Johnson and Linda L. Suttles, Land Law Examiners, Memorandum for Request for Navigability Recommendations, April 15, 1993, and handwritten note by Allyson Johnson, May 18, 1993, BLM files, AA-70153 (2653) and AA-70147 (2653).
- ²⁸ Heather A. Coats, Land Law Examiner, Decision to Convey Lands, December 13, 1995, BLM files, AA-70147.
- ²⁹ Terry R. Hassett, Chief, Branch of Gulf Rim Adjudication, Interim Conveyance No. 1660, January 26, 1996, BLM files, AA-70147.
- ³⁰ Robert L. Lloyd, Chief, Land Transfer Adjudication 1, Patent No. 50-2008-0135, January 23, 2008, BLM files, AA-70153.
- ³¹ Denny Benson, Easement Coordinator, Notice of Proposed Easement Recommendations, September 28, 2005, BLM files, F-14885-A.
- ³² Anne Laura Wood, Land Law Examiner, Decision to Approve Lands for Future Conveyance, January 6, 2006, BLM files, AA-76435; Proposed Tentative Approval, BLM files, AA-76435.
- ³³ Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988.

-
- ³⁴ K.J. Mushovic, Easement Coordinator, Final Easement Review and Patent Easement Memorandum for Lands to be Patented to Qanirtuuq, Inc. on behalf of the village of Quinhagak and to the Calista Corporation, March 30, 2006, BLM files, F-14885-EE.
- ³⁵ Dominica VanKoten, Chief, Navigability Section, Memorandum re Navigable Waters within ANCSA-Selected and Interim-Conveyed lands in the Quinhagak Village Project Area, May 18, 2006, BLM files, F-14885-A.
- ³⁶ McVee, Memorandum re Final Easements, October 25, 1979.
- ³⁷ Michael L. Menge, Commissioner, Alaska Department of Natural Resources, Letter to Henri Bisson, BLM State Director, and Julia Dougan, Acting BLM State Director, regarding BLM Administrative Finality Policy, August 21, 2006, Alaska Department of Natural Resources (ADNR)/Division of Mining, Land, and Water (ML&W)/Public Access Assertion & Defense Unit (PAAD Unit), Arolik River file.
- ³⁸ Richard Mylius, Acting Director, Division of Mining, Land and Water, Letter to Dominica VanKoten, Bureau of Land Management, Division of Cadastral Surveys, September 11, 2006, BLM files, F-14885-EE.
- ³⁹ Julia Dougan, BLM Associate State Director, Letter to Michael Menge, Commissioner, ADNR, November 7, 2006, BLM Files, 2000(AK932). Copy also found in ADNR/ML&W/PAAD Unit, Arolik River file.
- ⁴⁰ Ibid.
- ⁴¹ Dominica VanKoten, Chief, Navigability Section, Letter to Richard Mylius, Acting Director, Division of Mining, Land and Water. November 9, 2006, BLM files, 9600 (927).
- ⁴² Native allotment certification 50-91-0293.
- ⁴³ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 47.
- ⁴⁴ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, pp. 3-4, BLM files, F-14885 (75.4).
- ⁴⁵ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 50; Roger Clay, *A Compilation of Hydrologic Data on the Kuskokwim Region*, State of Alaska Department of Natural Resources, Division of Geological & Geophysical Surveys Water Resources Section Navigability Project. December, 1983 (unofficial version), p. 504.
- ⁴⁶ Clay, *A Compilation of Hydrologic Data on the Kuskokwim Region*, p. 504; Alt, *Inventory and Cataloging Western Alaska Waters*, p. 52.
- ⁴⁷ Alt, *Inventory and Cataloging Western Alaska Waters*, pp. 52, 50.
- ⁴⁸ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 4, BLM files, F-14885 (75.4).
- ⁴⁹ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 50.
- ⁵⁰ Clay, *A Compilation of Hydrologic Data on the Kuskokwim Region*, pp. 15, 16.
- ⁵¹ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 50.
- ⁵² Mark D. Rutherford, Waterbody Use and Observation Questionnaire, Alaska Department of Fish and Game (ADF&G), Anchorage, February 16, 2007, p. 1, ADNR/ML&W/PAAD Unit, Arolik River file.
- ⁵³ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 50.
- ⁵⁴ Ibid., p. 49.
- ⁵⁵ Robert W. Arndorfer, BLM memo from Deputy State Director for Conveyance Management to Deputy State Director for Cadastral Survey, re Navigable Waters in Group Survey 171 (Window 1562), March 29, 1988. pp. 2-3, BLM files, F-14885 (75.4).
- ⁵⁶ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 49.
- ⁵⁷ Ibid., 50. Alt described Karo Creek as only “slightly larger” than Keno Creek.
- ⁵⁸ Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988, p. 2.
- ⁵⁹ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 49.
- ⁶⁰ Clay, *A Compilation of Hydrologic Data on the Kuskokwim Region*, 461.
- ⁶¹ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ⁶² Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988, p. 3.
- ⁶³ Interview with Bill Lyle, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 2, BLM files, F-14885-EE (75.4).

-
- ⁶⁴ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 49.
- ⁶⁵ Clay, *A Compilation of Hydrologic Data on the Kuskokwim Region*, 46.
- ⁶⁶ Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988, p. 3.
- ⁶⁷ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 49.
- ⁶⁸ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ⁶⁹ Interview with Chuck Wade, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 5, BLM files, F-14885-EE (75.4); Alt, *Inventory and Cataloging Western Alaska Waters*, p. 47.
- ⁷⁰ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 47.
- ⁷¹ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ⁷² Alt, *Inventory and Cataloging Western Alaska Waters*, p. 47.
- ⁷³ Alt estimated 10 miles, Alt, *Inventory and Cataloging Western Alaska Waters*, p. 47; Alaska Department of Fish and Game biologist Keith Schultz gave an estimate of five miles, Interview with Keith Schultz, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 4, BLM files, F-14885-EE (75.4); BLM's Arndorfer estimated 2-2.5 miles, Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988, p. 3.
- ⁷⁴ George L. Harrington, *Mineral Resources of the Goodnews Bay Region, Alaska*, USGS Bulletin 714-E, Washington, D.C.: Government Printing Office, 1921, p. 208.
- ⁷⁵ Interview with Frank Matthew, January 13, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 2, BLM files, F-14885 (75.4).
- ⁷⁶ Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988, p. 5.
- ⁷⁷ Interview with Frank Matthew, January 13, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 2, BLM files, F-14885 (75.4); Arndorfer, Navigable Waters in Group Survey 171, March 29, 1988, p. 5.
- ⁷⁸ Interview with Chuck Wade, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 5, BLM files, F-14885-EE (75.4).
- ⁷⁹ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ⁸⁰ Clay, *A Compilation of Hydrologic Data on the Kuskokwim Region*, p. 15.
- ⁸¹ Interview with Keith Schultz, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 4, BLM files, F-14885-EE (75.4).
- ⁸² Brown, *Alaska's Kuskokwim River Region: A History*, p. 156.
- ⁸³ U.S. Department of the Interior, "Bay Proposed Resource Management Plan and Final Environmental Impact Statement," Bureau of Land Management, Anchorage Field Office, 2007, pp. 3-66 to 3-67.
- ⁸⁴ *Ibid.*, 3-67.
- ⁸⁵ Robert J. Wolfe, et al., *Subsistence-Based Economies in Coastal Communities of Southwest Alaska*, Technical Paper Number 89, Juneau, Alaska: ADF&G, Division of Subsistence, February, 1984, p. 350.
- ⁸⁶ Harrington, *Mineral Resources of the Goodnews Bay Region, Alaska*, map, p. 214a.
- ⁸⁷ Irving Reed, "Report on the Placer Deposits of the Goodnews-Arolic Gold Field," Alaska Territorial Department of Mines, MR-101-02, 1931, p. 27 and sketch map.
- ⁸⁸ Orth, *Dictionary of Alaska Place Names*, p. 87; Rollins, *Census Alaska*, p. 1880-8.
- ⁸⁹ Rollins, *Census Alaska*, pp. 1890-9, 1900-6, 1910-9, 1920-4, 1930-7, 1940-6, 1950-8, 1960-8, 1960-8, 1970-10.
- ⁹⁰ James W. Henkelman and Kurt H. Vitt, *Harmonious to Dwell: The History of the Alaska Moravian Church, 1885-1985*, Bethel, Alaska: Moravian Seminary and Archives, 1985, p. 241.
- ⁹¹ Robbin LaVine, et al., *Traditional Ecological Knowledge of 20th-Century Ecosystems and Fish Populations in the Kuskokwim Bay Region*, Final Report, Fisheries Resource Monitoring Program, FIS 04-351, Anchorage, U.S. Fish and Wildlife Service, Office of Subsistence Management: October 2007, p. 24.

-
- ⁹² Sam Pleasant, Sr., Affidavit filed with State of Alaska Fourth Judicial District on January 30, 1992, BLM file, FF-17541.
- ⁹³ LaVine, *Traditional Ecological Knowledge*, p. 23.
- ⁹⁴ *Ibid.*, p. 27.
- ⁹⁵ *Ibid.*, pp. 23, 24.
- ⁹⁶ *Ibid.*, 28-31, 24.
- ⁹⁷ *Ibid.*, 33.
- ⁹⁸ Wolfe, *Subsistence-Based Economies*, pp. 170, 320.
- ⁹⁹ *Ibid.*, p. 172.
- ¹⁰⁰ Henkelman and Vitt, *Harmonious to Dwell*, p. 252.
- ¹⁰¹ Harrington, *Mineral Resources of the Goodnews Bay Region, Alaska*, p. 221.
- ¹⁰² Philip S. Smith, *Mineral Industry of Alaska in 1940*, U.S.G.S. Bulletin 933-A, Washington, D.C.: Government Printing Office, 1942, p. 31.
- ¹⁰³ Brown, *Alaska's Kuskokwim River Region: A History*, p. 103.
- ¹⁰⁴ *Ibid.*, 104; A. G. Maddren, "Gold Placers of the Lower Kuskokwim, with a Note on Copper in the Russian Mountains," p. 299, in *The Lake Clark-Iditarod and Kuskokwim Regions, Alaska*, by Philip S. Smith and A. G. Maddren, U.S.G.S. Bulletin 622-H, Washington, D.C.: Government Printing Office, 1915.
- ¹⁰⁵ Maddren, "Gold Placers of the Lower Kuskokwim," p. 299.
- ¹⁰⁶ Brown, *Alaska's Kuskokwim River Region: A History*, p. 104.
- ¹⁰⁷ *Ibid.*, p. 108.
- ¹⁰⁸ Maddren, "Gold Placers of the Lower Kuskokwim," p. 299.
- ¹⁰⁹ Harrington, *Mineral Resources of the Goodnews Bay Region, Alaska*, pp. 227, 222-223.
- ¹¹⁰ Maddren, "Gold Placers of the Lower Kuskokwim," p. 303.
- ¹¹¹ Harrington, *Mineral Resources of the Goodnews Bay Region, Alaska*, p. 211.
- ¹¹² *Ibid.*, pp. 221, 215, 222, 227.
- ¹¹³ Frank W. Holzheimer, "Prospecting Proposed Dredging Ground, Arolic River District, Goodnews Bay Region, Alaska," MR 101-1, Juneau, Alaska: Alaska Territorial Department of Mines, November 1926, pp. 1, 6.
- ¹¹⁴ Reed, "Report on the Placer Deposits of the Goodnews-Arolic Gold Field," pp. 18-26.
- ¹¹⁵ *Ibid.*, p. 28a.
- ¹¹⁶ *Ibid.*, pp. 5-6.
- ¹¹⁷ *Ibid.*, pp. 26, 22, unnumbered page following p. 23.
- ¹¹⁸ Holzheimer, "Prospecting Proposed Dredging Ground, Arolic River District," p. 1.
- ¹¹⁹ Reed, "Report on the Placer Deposits of the Goodnews-Arolic Gold Field," pp. 22, 26.
- ¹²⁰ *Ibid.*, pp. 4, 20-22.
- ¹²¹ Philip S. Smith, *Mineral Industry of Alaska in 1936*, U.S.G.S. Bulletin 897-A, Washington, D.C.: Government Printing Office, 1938, p. 10; Philip S. Smith, *Mineral Industry of Alaska in 1938*, U.S.G.S. Bulletin 917-A, Washington, D.C.: Government Printing Office, 1939, p. 8.
- ¹²² Smith, *Mineral Industry of Alaska in 1938*, p. 8.
- ¹²³ Smith, *Mineral Industry of Alaska in 1936*, pp. 57, 39; Smith, *Mineral Industry of Alaska in 1940*, p. 31.
- ¹²⁴ Smith, *Mineral Industry of Alaska in 1936*, p. 59.
- ¹²⁵ J. C. Roehm, "General Report of Mining and Prospecting Activities, Goodnews Bay District, Alaska," MR 101-03, Juneau, Alaska: Alaska Territorial Department of Mines, 1937, pp. 1, 28.
- ¹²⁶ J. C. Roehm, "Summary Report of Mining Investigations in the Aniak-Tuluksak, Goodnews Bay and Kuskokwim Mining Districts to Commissioner of Mines and Itinerary of J. C. Roehm, Associate Engineer, Territorial Department of Mines, July 1 to August 10, 1939," IR 195-26, pp. 7-9.
- ¹²⁷ Smith, *Mineral Industry of Alaska in 1940*, p. 54.
- ¹²⁸ Smith, *Mineral Industry of Alaska in 1938*, pp.58, 75.
- ¹²⁹ J. C. Roehm, "Summary Report of Mining Investigations in the Bristol Bay, Bethel and Otter Precincts to B. D. Stewart, Commissioner of Mines, Juneau, Alaska, and Itinerary of J. C. Roehm, Associate Engineer, Territorial Department of Mines, August 1-31, 1937," IR-195-18, p. 1.
- ¹³⁰ Smith, *Mineral Industry of Alaska in 1940*, p. 54.
- ¹³¹ Brown, *Alaska's Kuskokwim River Region: A History*, p. 108.

-
- ¹³² Holzheimer, "Prospecting Proposed Dredging Ground, Arolic River District, Goodnews Bay Region, Alaska," p. 2.
- ¹³³ Irving Reed, "Report on the Placer Deposits of the Goodnews-Arolic Gold Field," 1931, MR-101-02, p. 6.
- ¹³⁴ J. C. Roehm, "Summary Report of Mining Investigations in the Bristol Bay, Bethel and Otter Precincts to B. D. Stewart, Commissioner of Mines, Juneau, Alaska, and Itinerary of J. C. Roehm, Associate Engineer, Territorial Department of Mines, August 1-31, 1937," IR-195-18, p. 1.
- ¹³⁵ Alaska Division of Mining, Land and Water, RST 326 Casefile Summary for Goodnews-Arolic River Trail, <http://dnr.alaska.gov/mlw/trails/rs2477/>. Accessed 11/17/09; USGS Goodnews Bay A-8, B-7, B-8, C-7 Quadrangle Maps.
- ¹³⁶ USGS Quadrangle Maps, Goodnews B7, C7, 1954.
- ¹³⁷ USGS Quadrangle Maps, Goodnews B7, C7, 1954.
- ¹³⁸ J. C. Roehm, "Notes Furnished by Territorial Department of Mines," p. 2.
- ¹³⁹ George L. Harrington, "Lower Kuskokwim and Goodnews Bay, 1919," FN-0422 (field notes), USGS, Alaska Science Center, Geology Office, Anchorage, Alaska.
- ¹⁴⁰ Holzheimer, "Prospecting Proposed Dredging Ground, Arolic River District, Goodnews Bay Region, Alaska," Itinerary page (no page number).
- ¹⁴¹ Reed, "Report on the Placer Deposits of the Goodnews-Arolic Gold Field," pp. 6, 2.
- ¹⁴² Philip S. Smith, *Mineral Industry of Alaska in 1941 and 1942*, U.S.G.S. Bulletin 943-A, Washington, D.C.: Government Printing Office, 1944, pp. 3-4, 10, 12.
- ¹⁴³ Joseph M. Hoare and Edward H. Cobb, "Mineral Occurrences (Other Than Mineral Fuels and Construction Materials) in the Bethel, Goodnews, and Russian Mission Quadrangles," Alaska, USGS Open-file report 77-156, 1977, p. 33, <http://ardf.wr.usgs.gov>.
- ¹⁴⁴ Travis Hudson, USGS Alaska Resource Data File, Open-File Report 01-270, Goodnews Bay quadrangle, p. 68.
- ¹⁴⁵ Calista Corporation, "Goodnews Bay Gold District," Anchorage: Calista Corporation, pp. 6, 5.
- ¹⁴⁶ LaVine, et al., *Traditional Ecological Knowledge*, pp. 31-33.
- ¹⁴⁷ Wolfe, *Subsistence-Based Economies*, pp. 170, 172-173.
- ¹⁴⁸ *Ibid.*, pp. 320-321.
- ¹⁴⁹ LaVine, pp. 34, 35.
- ¹⁵⁰ Wolfe, *Subsistence-Based Economies*, p. 170.
- ¹⁵¹ Native Allotment application of Sam Fox, September 29, 1971, AA-31296, Record Group 49, BLM Native Allotment Files, Box 12, file 14/06/14(1), NARA, Anchorage.
- ¹⁵² Meg Jensen, Native Allotment Field Report, January 10, 1986, Native Allotment file AA-31296, Record Group 49, BLM Native Allotment Files, Box 12, file 14/06/14(1), NARA, Anchorage.
- ¹⁵³ Native Allotment application of Sam Pleasant, September 29, 1971, BLM file AA-54954; Van Waggoner, Native Allotment Field Reports for AA-54954-B and AA-54954-C, February 26, 1987, BLM file.
- ¹⁵⁴ Sam Pleasant, Affidavit filed with State of Alaska Fourth Judicial District on November 29, 1984, BLM file, AA-54954.
- ¹⁵⁵ Van Waggoner, Native Allotment Field Reports for AA-54954-B and AA-54954-C, February 26, 1987, BLM files.
- ¹⁵⁶ Jesse Carter, Sr., Affidavit filed with State of Alaska Fourth Judicial District on February 17, 1993, BLM file, AA-54954.
- ¹⁵⁷ Paul Beebe, Affidavit filed with State of Alaska Fourth Judicial District on February 17, 1993, BLM file, AA-54954.
- ¹⁵⁸ Robert D. Roberts, Affidavit filed with State of Alaska Fourth Judicial District on February 17, 1993, BLM file, AA-54954.
- ¹⁵⁹ Native Allotment application of Charlie Pleasant, September 27, 1971, AA-31290, Record Group 49, BLM Native Allotment files, Box 7, file 22/03/13(3), NARA, Anchorage.
- ¹⁶⁰ Carl Neufelder, Native Allotment Field Report for AA-31290, March 26, 1985, Record Group 49, BLM Native Allotment files, Box 7, file 22/03/13(3), NARA, Anchorage.
- ¹⁶¹ Native Allotment application of Charlie Fullmoon, October 17, 1971, BLM file, FF-17541.

-
- ¹⁶² Van Waggoner, Native Allotment Field Report for FF-17541, February 25, 1987, BLM file.
- ¹⁶³ James Fox, Affidavit, February 6, 1992, BLM Native Allotment file FF-17541.
- ¹⁶⁴ Willie Hill, Affidavit, February 6, 1992, BLM Native Allotment file FF-17541.
- ¹⁶⁵ Sam Pleasant, Sr., Affidavit, January 30, 1992, BLM Native Allotment File FF-17541.
- ¹⁶⁶ Carl Neufelder, Native Allotment Field Report for AA-37760-A, January 22, 1985, Record Group 49, BLM Native Allotment files, Box 9, file 22/03/13(5), NARA, Anchorage.
- ¹⁶⁷ Native Allotment application of Esau Moore, Sr., September 28, 1971, AA-31289, Record Group 49, BLM Native Allotment files, Box 8, file 22/03/13(4), NARA, Anchorage.
- ¹⁶⁸ Joe C. Morris, Jr., Native Allotment Field Report for AA-31289-B, October 15, 1984, Record Group 49, BLM Native Allotment files, Box 8, file 22/03/13(4), NARA, Anchorage.
- ¹⁶⁹ Native Allotment application of Paul Beebe, September 27, 1971, AA-37778, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.
- ¹⁷⁰ Joe C. Morris, Jr., Native Allotment Field Report for AA-37778, March 20, 1985, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.
- ¹⁷¹ Native Allotment application of Joseph Hunter, September 27, 1971, AA-37761, Record Group 49, BLM Native Allotment files, Box 5, file 14/06/14(2), NARA, Anchorage.
- ¹⁷² Russel D. Blome, Native Allotment Field Report for AA-37761-B, September 28, 1984, Record Group 49, BLM Native Allotment files, Box 5, file 14/06/14(2), NARA, Anchorage.
- ¹⁷³ Joseph Hunter to Bureau of Indian Affairs, Bethel, Alaska, August 10, 1982, Record Group 49, BLM Native Allotment files, Box 5, file 14/06/14(2), NARA, Anchorage.
- ¹⁷⁴ Native Allotment application of Charles Evans, September 27, 1971, AA-37765, Record Group 49, BLM Native Allotment files, Box 10, file 22/03/13(6), NARA, Anchorage.
- ¹⁷⁵ Joe C. Morris, Jr., Native Allotment Field Report for AA-37765-B, March 11, 1985, Record Group 49, BLM Native Allotment files, Box 10, file 22/03/13(6), NARA, Anchorage.
- ¹⁷⁶ Carl Neufelder, Native Allotment Field Report for AA-37760-B, January 22, 1985, Record Group 49, BLM Native Allotment files, Box 9, file 22/03/13(5), NARA, Anchorage.
- ¹⁷⁷ Native Application of Dan O. Kuku, September 27, 1971, AA-31275, Record Group 49, BLM Native Allotment files, Box 7, file 22/03/13(3), NARA, Anchorage.
- ¹⁷⁸ Sylvia K. Hale, Native Allotment Field Report for AA-31275-C, September 23, 1986, Record Group 49, BLM Native Allotment files, Box 7, file 22/03/13(3), NARA, Anchorage.
- ¹⁷⁹ Native Allotment application of Henry Matthew, September 27, 1971, AA-37773, Record Group 49, BLM Native Allotment files, Box 6, file 14/07/08(1), NARA, Anchorage.
- ¹⁸⁰ Sylvia Hale, Native Allotment Field Report for AA-37773, March 7, 1986, Record Group 49, BLM Native Allotment files, Box 6, file 14/07/08(1), NARA, Anchorage.
- ¹⁸¹ Native Allotment application of Moses Mark, September 29, 1971, AA-31274, Record Group 49, BLM Native Allotment files, Box 3, file 14/06/14(4), NARA, Anchorage.
- ¹⁸² Chris Mayer, Native Allotment Field Report for AA-31274-C, December 11, 1985, Record Group 49, BLM Native Allotment files, Box 3, file 14/06/14(4), NARA, Anchorage.
- ¹⁸³ Meg Jensen, Native Allotment Field Report for AA-37774-C, September 11, 1985, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.
- ¹⁸⁴ Native Allotment Application of Frank Matthew, Sr., September 28, 1971, AA-37774, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.
- ¹⁸⁵ Interview with Frank Matthew, January 13, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 1, BLM files, F-14885 (75.4).
- ¹⁸⁶ Rolfe Buzzell, "Kisaralik River System (Including interconnected slough and Kisaralik Lake), HUC 30502, Zone 2, Kuskokwim River Region, Final Summary Report" Kuskokwim Assistance Agreement, Phase IV Submission, Alaska Department of Natural Resources, January 15, 2010, pp. 27-31, 39-40; Rolfe Buzzell, "Kwethluk River, HUC 30502, Zone 2, Kuskokwim River Region, Interim Summary Report" Kuskokwim Assistance Agreement, Phase II-B Submission, Alaska Department of Natural Resources, November 20, 2009, pp. 28-31.
- ¹⁸⁷ Meg Jensen, Native Allotment Field Report for AA-37774-D, September 12, 1985, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.

-
- ¹⁸⁸ Native Allotment Application of Willie Mark, September 29, 1971, AA-31273, Record Group 49, BLM Native Allotment files, Box 6, file 18/01/09(4), NARA, Anchorage.
- ¹⁸⁹ Meg Jensen, Native Allotment Field Report for AA-31273-D, October 23, 1985, Record Group 49, BLM Native Allotment files, Box 6, file 18/01/09(4), NARA, Anchorage.
- ¹⁹⁰ Native Allotment of James Williams, September 29, 1971, AA-37772, Record Group 49, BLM Native Allotment files, Box 7, file 18/01/09(5), NARA, Anchorage.
- ¹⁹¹ Clifford Ells, Native Allotment Field Report for AA-37772-A, June, 5, 1986, Record Group 49, BLM Native Allotment files, Box 7, file 18/01/09(5), NARA, Anchorage.
- ¹⁹² Moses Mark, Deposition regarding his Native Allotment AA-31274-B, May 1, 1985, Record Group 49, BLM Native Allotment files, Box 3, file 14/06/14(4), NARA, Anchorage.
- ¹⁹³ Chris Mayer, Native Allotment Field Report for AA-31274-B, December 11, 1985, Record Group 49, BLM Native Allotment files, Box 3, file 14/06/14(4), NARA, Anchorage.
- ¹⁹⁴ Interview with Frank Matthew, January 13, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 1, BLM files, F-14885 (75.4).
- ¹⁹⁵ Native Allotment of John Albert Sharp, September 29, 1971, AA-37771, Record Group 49, BLM Native Allotment files, Box 7, file 18/01/09(5), NARA, Anchorage.
- ¹⁹⁶ Sylvia K. Hale, Native Allotment Field Report for AA-37771, September 18, 1986, Record Group 49, BLM Native Allotment files, Box 7, file 18/01/09(5), NARA, Anchorage.
- ¹⁹⁷ Native Allotment application of Oscar Friendly, September 28, 1971, FF-17288, Record Group 49, BLM Native Allotment files, Box 1, file 22/03/11(1), NARA, Anchorage.
- ¹⁹⁸ Clifford Ells, Native Allotment Field Report for F-17288, June, 30, 1976, Record Group 49, BLM Native Allotment files, Box 1, file 22/03/11(1), NARA, Anchorage.
- ¹⁹⁹ Native Allotment Application of Frank Matthew, Sr., September 28, 1971, AA-37774, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.
- ²⁰⁰ Meg Jensen, Native Allotment Field Report for AA-37774-D, September 12, 1985, Record Group 49, BLM Native Allotment files, Box 7, file 14/07/08(2), NARA, Anchorage.
- ²⁰¹ Interview with Frank Matthew, January 13, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 1, BLM files, F-14885 (75.4).
- ²⁰² *Ibid.*, p. 2.
- ²⁰³ Native Allotment application of John Johnson, September 27, 1971, AA-37768, Record Group 49, BLM Native Allotment files, Box 7, file 18/01/09(5), NARA, Anchorage.
- ²⁰⁴ Carl Neufelder, Native Allotment Field Report for AA-37768-B, March 12, 1985, Record Group 49, BLM Native Allotment files, Box 7, file 18/01/09(5), NARA, Anchorage.
- ²⁰⁵ Native Allotment application of Carrie Cleveland, September 27, 1971, AA-31276, Record Group 49, BLM Native Allotment files, Box 5, file 15/04/08(6), NARA, Anchorage.
- ²⁰⁶ Chris Mayer, Native Allotment Field Report for AA-31276-B, October 15, 1985, Record Group 49, BLM Native Allotment files, Box 5, file 15/04/08(6), NARA, Anchorage.
- ²⁰⁷ Native Allotment application of Dan O. Kuku, September 27, 1971, AA-31275, Record Group 49, BLM Native Allotment files, Box 7, file 22/03/13(3), NARA, Anchorage.
- ²⁰⁸ Sylvia K. Hale, Native Allotment Field Report for AA-31275-B, September 23, 1986, Record Group 49, BLM Native Allotment files, Box 7, file 22/03/13(3), NARA, Anchorage.
- ²⁰⁹ U.S. Department of the Interior, "Bay Proposed Resource Management Plan and Final Environmental Impact Statement," p. 3-65.
- ²¹⁰ LaVine, *Traditional Ecological Knowledge*, pp. 34-35.
- ²¹¹ Wolfe, *Subsistence-Based Economies*, pp. 269-271.
- ²¹² *Ibid.*, p. 357.
- ²¹³ LaVine, *Traditional Ecological Knowledge*, pp. 70, 73, 79, 81, 84.
- ²¹⁴ Wolfe, *Subsistence-Based Economies*, pp. 416, 417.
- ²¹⁵ LaVine, *Traditional Ecological Knowledge*, pp. 46, 58, 57.
- ²¹⁶ Wolfe, *Subsistence-Based Economies*, pp. 363, 368.
- ²¹⁷ *Ibid.*, p. 381-382.
- ²¹⁸ *Ibid.*, pp. 320-321.
- ²¹⁹ *Ibid.*, pp. 319, 321-324, 326.

-
- ²²⁰ Interview with Alexie Pleasant, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 2, BLM files, F-14885-EE (75.4).
- ²²¹ Interview with Joshua Cleveland, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 2-3, BLM files, F-14885-EE (75.4).
- ²²² Interview with Julius Henry, December 10, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562), by David Rukke, December 19, 1986, p. 3, BLM files, F-14885-EE (75.4).
- ²²³ Interview with Joshua Cleveland, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, pp. 2-3, BLM files, F-14885-EE (75.4).
- ²²⁴ Interview with Julius Henry, December 10, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562), by David Rukke, December 19, 1986, p. 3, BLM files, F-14885-EE (75.4).
- ²²⁵ Rutherford, Waterbody Use and Observation Questionnaire, pp. 1, 2, 4.
- ²²⁶ Map 3.14, "Caribou Habitat and Migration Patterns," in U.S. Department of the Interior, "Bay Proposed Resource Management Plan and Final Environmental Impact Statement," Bureau of Land Management, Anchorage Field Office, 2007.
- ²²⁷ Rutherford, Waterbody Use and Observation Questionnaire.
- ²²⁸ Interview with Jonie Snellgrove, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562), by David Rukke, December 19, 1986, p. 4, BLM files, F-14885-EE (75.4).
- ²²⁹ Interview with Bill Lyle, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562), by David Rukke, December 19, 1986, p. 2, BLM files, F-14885-EE (75.4).
- ²³⁰ Interview with Chris Goll, January 19, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, pp. 2-3, BLM files, F-14885 (75.4).
- ²³¹ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ²³² Rob MacDonald, "Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1996." Fishery Data Series Number 97-4. U.S. Department of the Interior, Fish and Wildlife Service, Togiak National Wildlife Refuge, May 1997, p. 18.
- ²³³ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 8.
- ²³⁴ Alt, *Inventory and Cataloging Western Alaska Waters*, pp. 47, 8, 7, 50, 52.
- ²³⁵ R. Eric Minard and Dan O. Dunaway, "Compilation of Age, Weight, and Length Statistics for Rainbow Trout Samples Collected in Southwest Alaska, 1954 through 1989," Fishery Data Series No. 91-62, Alaska Department of Fish and Game, Division of Sport Fish, November 1991, pp. 1, 4, 7, 235, 210.
- ²³⁶ Mark J. Lisac and Rob MacDonald, "Length Frequency, Age Distribution and Movements of Rainbow Trout in the Arolik River, Togiak National Wildlife Refuge, Alaska, 1991-1994," Alaska Fisheries Technical Report Number 34, U.S. Fish and Wildlife Service, Togiak National Wildlife Refuge, October, 1995, pp. 5, 7, 14, 15, 6.
- ²³⁷ MacDonald, "Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1996," pp. 17-19.
- ²³⁸ Rob MacDonald and Mark J. Lisac, "Species Occurrence, Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1997," Fishery Data Series Number 98-5, U.S. Fish and Wildlife Service, Togiak National Wildlife Refuge, April 1998, pp. 1, 5, 26.
- ²³⁹ Interviews with Keith Schultz and Jonie Snellgrove, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, pp. 3-4, BLM files, F-14885-EE (75.4).
- ²⁴⁰ Rutherford, Waterbody Use and Observation Questionnaire, p. 4.

-
- ²⁴¹ Minard and Dunaway, "Compilation of Age, Weight, and Length Statistics for Rainbow Trout Samples Collected in Southwest Alaska, 1954 through 1989," p. 2; MacDonald and Lisac, "Species Occurrence, Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1997," pp. 3, 17; Charles C. Krueger, Mark J. Lisac, Steve J. Miller, and William J. Spearman, "Genetic Differentiation of Rainbow Trout (*Oncorhynchus mykiss*) in the Togiak National Wildlife Refuge, Alaska," Alaska Fisheries Technical Report No. 55, Anchorage, Alaska: Fish Genetics Laboratory, U.S. Fish and Wildlife Service, December 1999, p. 1; Alt, *Inventory and Cataloging Western Alaska Waters*, pp. 50, 52; Lisac and MacDonald, "Length Frequency, Age Distribution and Movements of Rainbow Trout in the Arolik River, Togiak National Wildlife Refuge, Alaska, 1991-1994," pp. 1, 23-24.
- ²⁴² U.S. Department of the Interior, "Bay Proposed Resource Management Plan and Final Environmental Impact Statement," p. 3-53.
- ²⁴³ Lisac and MacDonald, "Length Frequency, Age Distribution and Movements of Rainbow Trout in the Arolik River, Togiak National Wildlife Refuge, Alaska, 1991-1994," p. 23.
- ²⁴⁴ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 50.
- ²⁴⁵ <http://www.deneki.com/2009/01/the-arolik-river>
- ²⁴⁶ Alt, *Inventory and Cataloging Western Alaska Waters*, p. 52.
- ²⁴⁷ Lisac and MacDonald, "Length Frequency, Age Distribution and Movements of Rainbow Trout in the Arolik River, Togiak National Wildlife Refuge, Alaska, 1991-1994," pp. 1, 24.
- ²⁴⁸ Interview with Keith Schultz, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 4, BLM files, F-14885-EE (75.4).
- ²⁴⁹ <http://www.deneki.com/2009/01/the-arolik-river>
- ²⁵⁰ Interview with Bill Lyle, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 2, BLM files, F-14885-EE (75.4).
- ²⁵¹ Interview with Chuck Wade, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 5, BLM files, F-14885-EE (75.4).
- ²⁵² Rutherford, Waterbody Use and Observation Questionnaire, p. 4.
- ²⁵³ Interview with Bill Lyle, December 9, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 2, BLM files, F-14885-EE (75.4).
- ²⁵⁴ Interview with Chuck Wade, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 5, BLM files, F-14885-EE (75.4).
- ²⁵⁵ Interview with Chris Goll, January 19, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, pp. 2-3, BLM files, F-14885 (75.4).
- ²⁵⁶ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ²⁵⁷ <http://www.deneki.com/2009/10/the-arolik-bus>
- ²⁵⁸ Rutherford, Waterbody Use and Observation Questionnaire, pp. 3, 4.
- ²⁵⁹ <http://www.deneki.com/2009/01/the-arolik-river>, accessed 1-4-2010.
- ²⁶⁰ Interview with Chuck Wade, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 5, BLM files, F-14885-EE (75.4).
- ²⁶¹ Interview with Chris Goll, January 19, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ²⁶² Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ²⁶³ <http://www.deneki.com/2009/01/the-arolik-river>, accessed January 4, 2010; <http://www.alaskawest.com/alaska/arolik.fm>, accessed February 7, 2007.
- ²⁶⁴ Coastal Villages Region Fund, "A Statement of Strength, 2000 Year in Review," no page numbers, <http://www.coastalvillages.org/pdf/cvrf00annualreport.pdf>, accessed January 26, 2010.

-
- ²⁶⁵ “Economic Impacts of the CDQ Program 1992-2002,” Chapter 5, Coastal Villages Region Fund, p. 55, in *Western Alaska Community Development Handbook*, State of Alaska, Department of Community and Economic Development, July 9, 2003, http://www.commerce.state.ak.us/bsc/CDQ/cdq_handbook/16_cdq_chapt5_CVRF.pdf, accessed January 26, 2010.
- ²⁶⁶ Tim Woody, “It’s All About the Fishing,” *Alaska Magazine*, http://www.alaskamagazine.com/index.php?option=com_content&task=view&id=56&Itemid=36
- ²⁶⁷ <http://www.pbadventures.com/fishing.html>, accessed December 12, 2009.
- ²⁶⁸ MacDonald, “Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1996,” p. 19.
- ²⁶⁹ Carl L. Williams, Waterbody Use and Observation Questionnaire, ADF&G, Anchorage, October 10, 1996, ADNR/ML&W/PAAD Unit, Arolik River file.
- ²⁷⁰ Ed Swanson, President, Knik Kanoers & Kayakers, Letter to Dick Thompson, BLM, Anchorage, September 18, 1975, pp. 1-3, ADNR/ML&W/PAAD Unit, Arolik River file.
- ²⁷¹ Interview with Chris Goll, August 26, 1985, by Dale Stirling, ADNR/ML&W/PAAD Unit, Arolik River file.
- ²⁷² Interview with Chuck Wade, December 11, 1986, in BLM Memorandum re Interviews for Group Survey No. 171, Quinhagak Village (Window 1562) by David Rukke, December 19, 1986, p. 5, BLM files, F-14885-EE (75.4).
- ²⁷³ Interview with Chris Goll, January 19, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 2, BLM files, F-14885 (75.4).
- ²⁷⁴ Interview with William Lyle, January 20, 1988, in Susan DiPrete, BLM Memorandum re Interviews for Group Survey 171 (Quinhagak), January 27, 1988, p. 3, BLM files, F-14885 (75.4).
- ²⁷⁵ Glenn Paul Martin, Waterbody Use and Observation Questionnaire for the Arolik River, ADF&G, Anchorage, October 20, 1995, ADNR/ML&W/PAAD Unit, Arolik River file.
- ²⁷⁶ http://www.freshwateradventure.com/Html/Arolik_river_Info.html
- ²⁷⁷ MacDonald, “Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1996,” pp. 17-18.
- ²⁷⁸ Rutherford, Waterbody Use and Observation Questionnaire, p. 1.
- ²⁷⁹ <http://www.wildriverfish.com>, accessed January 3, 2010.
- ²⁸⁰ Rutherford, Waterbody Use and Observation Questionnaire, pp. 2-4.
- ²⁸¹ Arndorfer, Memorandum on Navigable Waters in Group Survey 171 (Window 1562), March 29, 1988, BLM files, F-14885.
- ²⁸² <http://www.bayair-alaska.com/>, accessed December 3, 2009.
- ²⁸³ <http://www.pbadventures.com/fishing.html>, accessed December 3, 2009.
- ²⁸⁴ <http://www.tikchikairventures.com>, accessed January 6, 2010.
- ²⁸⁵ U.S. Department of the Interior, “Bay Proposed Resource Management Plan and Final Environmental Impact Statement,” p. 3-91.
- ²⁸⁶ Dominica VanKoten, Chief, Navigability Section, Memorandum on Navigable Waters within ANCSA-Selected and Interim-Conveyed lands in the Quinhagak Village Project Area, May 18, 2006, BLM files, F-14885-A.
- ²⁸⁷ Richard Mylius, Acting Director, Division of Mining, Land and Water, Letter to Dominica VanKoten, Bureau of Land Management, Division of Cadastral Surveys, September 11, 2006, BLM files, F-14885-EE.
- ²⁸⁸ MacDonald and Lisac, “Species Occurrence, Length Frequency and Age Distribution of Resident Fish Collected from Rivers Within Togiak National Wildlife Refuge, Alaska, 1997,” pp. 17, 3.