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**2021-2041**  
**Kaktovik Comprehensive Plan**

**PUBLIC REVIEW**

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KAKTOVIK, ALASKA
Comprehensive Plan
2021 – 2041

A guide for community growth and development

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Cover photo courtesy of [placeholder]
Kaktovik
Comprehensive Plan

Adopted by the North Slope Borough on [date]

North Slope Borough Assembly Ordinance #
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UMIAQ Environmental developed this plan with Eskimos, Inc. Glenn Gray and Associates provided the Adaption Strategies for Climate Change Impacts in Appendix B.

The Comprehensive Planning Stakeholder Committee and Ida Angasan, the Kaktovik representative, provided invaluable input on improving both the plan and the planning process. The Kaktovik community residents contributed both time and direction for the contents of this plan. The greatest contributions came from residents during public meetings that were held to seek and incorporate local knowledge, expertise, and a vision for the future of the community, serving as the foundation of this planning effort.
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<th>Description</th>
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<tbody>
<tr>
<td>AAAQS</td>
<td>Alaska Ambient Air Quality Standards</td>
</tr>
<tr>
<td>ADEC</td>
<td>Alaska Department of Environmental Conservation</td>
</tr>
<tr>
<td>AEA</td>
<td>Alaska Energy Authority</td>
</tr>
<tr>
<td>AEWC</td>
<td>Alaska Eskimo Whaling Commission</td>
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<tr>
<td>AHFC</td>
<td>Alaska Housing Finance Corporation</td>
</tr>
<tr>
<td>ANCILA</td>
<td>Alaska National Interest Lands Conservation Act</td>
</tr>
<tr>
<td>ANCSA</td>
<td>Alaska Native Claims Settlement Act</td>
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<td>ANWR</td>
<td>Arctic National Wildlife Refuge</td>
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<tr>
<td>AS</td>
<td>Alaska Statutes</td>
</tr>
<tr>
<td>ASRC</td>
<td>Arctic Slope Regional Corporation</td>
</tr>
<tr>
<td>ASTAC</td>
<td>Arctic Slope Telephone Association</td>
</tr>
<tr>
<td>ATV</td>
<td>All-terrain vehicle</td>
</tr>
<tr>
<td>AWOS</td>
<td>Automated Weather Observing Systems</td>
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<td>BIA</td>
<td>Bureau of Indian Affairs</td>
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<td>Bureau of Land Management</td>
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<td>British Thermal Units</td>
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<td>Cold Climate Housing Research Center</td>
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<td>CIP</td>
<td>Capital Improvement Program</td>
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<td>CPR</td>
<td>Cardiopulmonary resuscitation training</td>
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<td>DCCED</td>
<td>Alaska Department of Commerce, Community, and Economic Development</td>
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<td>DEW Line</td>
<td>Distant Early Warning Line</td>
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<td>DNR</td>
<td>Alaska Department of Natural Resources</td>
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<td>DOT&amp;PF</td>
<td>Alaska Department of Transportation and Public Facilities</td>
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<td>EIS</td>
<td>Environmental Impact Statement</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
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<td>FLEIS</td>
<td>Final Legislative Environmental Impact Statement</td>
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<td>Federal Land Use Policy and Management Act</td>
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<td>GARR</td>
<td>Gates of the Arctic National Park</td>
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<td>HUD</td>
<td>Department of Housing and Urban Development</td>
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<td>Indian Reorganization Act</td>
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<td>Kaktovik Iñupiat Corporation</td>
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<td>kW</td>
<td>kilowatt</td>
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<td>Term</td>
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<td>----------------</td>
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<td>kWh</td>
<td>kilowatt hour</td>
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<td>Long Range Radar Station</td>
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<td>MIIRL</td>
<td>Medium Intensity Runway Lights</td>
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<td>NAHASDA</td>
<td>Native American Housing and Self-Determination Act</td>
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<td>NGO</td>
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<td>NPS</td>
<td>National Park Service</td>
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<td>NRC</td>
<td>National Research Council</td>
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<td>NSB</td>
<td>North Slope Borough</td>
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<td>NSBC</td>
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<td>North Slope Borough Economic Profile and Census Report</td>
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<td>NSBSD</td>
<td>North Slope Borough School District</td>
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<tr>
<td>NVK</td>
<td>Native Village of Kaktovik</td>
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<tr>
<td>OCS</td>
<td>Outer Continental Shelf</td>
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<tr>
<td>PAPI</td>
<td>Precision Approach Path Indicator</td>
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<td>PCB</td>
<td>Polychlorinated biphenyl</td>
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<td>PCE</td>
<td>Alaska Power Cost Equalization Program</td>
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<td>PFD</td>
<td>Permanent Fund Dividend</td>
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<td>Resource Development District</td>
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<td>Runway End Indicator Light</td>
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<td>ROD</td>
<td>Record of Decision</td>
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<td>ROSS</td>
<td>Residents Opportunity for Self-Sufficiency</td>
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<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities and Threats</td>
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<tr>
<td>SY</td>
<td>School Year</td>
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<tr>
<td>TDHE</td>
<td>Tribally Designated Housing Entity</td>
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<tr>
<td>TLUI</td>
<td>Traditional Land Use Inventory</td>
</tr>
<tr>
<td>TNHA</td>
<td>Tagiugmiullu Nunamiullu Housing Authority</td>
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<tr>
<td>U.S.</td>
<td>United States</td>
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<tr>
<td>USCG</td>
<td>U.S. Coast Guard</td>
</tr>
<tr>
<td>USDI</td>
<td>U.S. Department of the Interior</td>
</tr>
<tr>
<td>USDW</td>
<td>Utilities School District Warehouse</td>
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<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
</tr>
<tr>
<td>USGS</td>
<td>U.S. Geological Survey</td>
</tr>
<tr>
<td>VMS</td>
<td>Public Works Vehicle Maintenance Shop</td>
</tr>
<tr>
<td>WTP</td>
<td>Water treatment plant</td>
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<tr>
<td>WWTP</td>
<td>Wastewater treatment plant</td>
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Iñupiaq Executive Summary

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Executive Summary

Kaktovik’s Comprehensive Plan is the vision for the community’s future. It reflects the voice of residents who shared their hopes, concerns, and dreams about the future. It is a guiding document for village leadership and those working or planning to work in the land of the Kavtovikmiut over the next twenty years and beyond. The plan also provides a policy basis for capital planning, land use regulation, and coordination within and external to the community. The comprehensive plan also strengthens the community’s ability to successfully seek grant funding for projects important to residents.

The Iñupiat of Kaktovik highly regard family, work ethic, the Iñupiaq language, drumming and dancing, and sharing food and knowledge of the environment and its inhabitants. They have a deep respect for the environment in which they live as it provides fresh water, clean air, and subsistence foods. Subsistence activities play a large role in the community. For Alaska Natives of the North Slope, subsistence is a connection to the land and the way the Iñupiat passed down traditional knowledge through generations. Kaktovik residents rely on a variety of seasonally abundant resources of terrestrial and, marine mammals, fish, and waterfowl for much of their diet. Residents travel often as far west as Deadhorse, east past Hershel Island in Canada, south deep into the Arctic National Wildlife Refuge and fifty miles or more into the Beaufort Sea for subsistence activities. However, the range that Kaktovik residents travel for...
subsistence hunting and fishing can change over time as traditional subsistence land use patterns change based on the availability of animals and fish. The area of influence included in Chapter 6 can be used to determine community stakeholders that may need to be consulted prior to activity that may affect the Kaktovikmiut’s traditional use of the land.

Kaktovik is a one square mile city located on a four-mile wide barrier island in the Beaufort Sea coast of Alaska, along the Beaufort Sea, ninety miles from the Canadian border. It lies entirely within the boundaries of the 19.5 million acre Arctic National Wildlife Refuge and is also the easternmost village in the North Slope Borough. Barter Island once served as an important location for trade between the Canadian Inuit and Iñupiat from the Utqiagvik region during the 1800s. The location later became a stopover for commercial whalers and then for fur trapping. In 1923, a trading post was established at Barter Island, attracting more families to the area. The U.S. military then constructed a Long Range Radar Station and associated infrastructure and facilities beginning in 1952 on the same location as a prehistoric village. Due to the U.S. military’s facilities and activity, Kaktovik residents were relocated three times over the years.

The U.S. decennial census provides data on the Kaktovik population as far back as 1950, when there was approximately 46 people living in the area. Today, approximately 246 people call Kaktovik home, 88 percent of which are Iñupiat. It is one of eight communities within the North Slope Borough, a vast area that encompasses of nearly 95,000 square miles across northern Alaska that has a total population of only 8,638 residents. A modest growth population projection over the next twenty years indicates an increase of 26 people by 2040, to 273 residents.
This plan is organized by chapters that provide the foundation for understanding the both resident priorities and interests as well as issues facing the community. These chapters tell the Kaktovikmiut story – not just the community’s location, but also the people’s cultural ties to the land and waters and the importance of subsistence as well as the need for infrastructure upgrades and the complexity of affordable and safe housing.

### Plan Organization

1. **Introduction**
   - The purpose and legal basis for comprehensive planning, an overview of previous planning efforts, public involvement for this plan update, and the Vision Statement are included in this chapter.

2. **Goals, Objectives, Strategies**
   - The goals, objectives, and strategies are intended to reflect community values and input and provide courses of action for change.

3. **Government, History, and Culture**
   - This chapter is an overview of the governmental functions of the community and a glimpse into its rich history, language, and values.

4. **People of Kaktovik**
   - The community’s historical population, race, dependency ratios, contributors to population growth and population projections are included here.

5. **Natural Environment**
   - Air quality, wildlife, tundra fires, climate change, coastal erosion and how these issues affect the Kaktovik community are covered in this chapter.

6. **Subsistence**
   - The subsistence chapter focuses on the importance of subsistence activities to the community as well as background on subsistence harvests and subsistence seasons.

7. **Public Facilities**
   - This chapter includes an overview of public infrastructure and capacity over the next twenty years.

8. **Health, Education, Economy**
   - Personal and community health, graduation rates, school facilities, household income, the size of the labor force, and subsistence contributions to the economy are discussed.

9. **Housing**
   - Housing, a critical issue in Kaktovik, is analyzed, including rates of overcrowding, age of housing, and housing need, both current and into the future.

10. **Land Use and Zoning**
    - In addition to land ownership, uses, and restrictions, this chapter provides an overview of ANCSA, ANWR, and contaminated sites.
Kaktovik Vision Statement

Kaktovik is a healthy community where residents value their strong family ties, traditional Iñupiat values, and healthy subsistence living. Residents are good stewards of the environment and protect the waters, lands, and air quality from any degradation or damage so that wildlife is healthy and sustainable and all who live in and visit Kaktovik can continue to enjoy its abundant natural resources, clean waters and air, and a healthy subsistence lifestyle.

Residents pass on traditional knowledge of weather, landforms, biotic and subsistence resources, and hunting methods to new generations and embrace compatible modern technologies, and contemporary knowledge that help residents maintain a healthy, safe and affordable community.

Village leadership promotes a diverse economy supporting local businesses and clean industries that provide resident employment flexible enough to support seasonal subsistence activities.

A variety of adequate safe, sanitary, and affordable housing is available for all ages and income levels, along with quality infrastructure and convenient and reliable community facilities.

Residents promote a healthy lifestyle, an involved citizenry, sharing of resources and knowledge, and community cooperation in decision making to ensure that orderly, well-understood conservation and development occurs in the village and its environs to assure a healthy and sustainable community for generations to come.

### COMPREHENSIVE PLAN GOALS

<table>
<thead>
<tr>
<th>Goal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Collectively prepare for future natural resource development and associated land uses to protect the natural environment and subsistence lands.</td>
</tr>
<tr>
<td>Two</td>
<td>Preserve Iñupiaq traditions and cultural activities.</td>
</tr>
<tr>
<td>Three</td>
<td>Maintain, protect, and expand community facilities and infrastructure.</td>
</tr>
<tr>
<td>Four</td>
<td>Support housing quality, variety, and affordability.</td>
</tr>
<tr>
<td>Five</td>
<td>Maintain and expand community services to provide improved care for residents.</td>
</tr>
<tr>
<td>Six</td>
<td>Develop a strong and resilient local economy.</td>
</tr>
<tr>
<td>Seven</td>
<td>Seek meaningful intergovernmental and community cooperation and resident participation in decision-making for betterment of all village residents.</td>
</tr>
</tbody>
</table>
During the winter of 2020, the North Slope Borough (NSB) launched the Kaktovik Comprehensive Plan update, a village-wide community engagement effort to update the 2015 Kaktovik Comprehensive Plan. The North Slope Borough undertook a future visioning process and Strengths, Weaknesses, Opportunities, and Threats workshops as initial steps in updating the comprehensive plan. These efforts engaged leadership at the City of Kaktovik, Native Village of Kaktovik, and Kaktovik Iñupiat Corporation (KIC) as well as the community residents to develop a shared understanding of the community today and to anchor the planning process that will address key issues for the future. This comprehensive plan is a statement of what the community of Kaktovik wants to become. It is a set of goals, objectives, and implementing strategies designed to achieve a community-wide vision.

Kaktovik is located on Barter Island, which lies offshore from the 19.5 million acre Arctic National Wildlife Refuge (ANWR) and is one of the larger barrier islands in the Beaufort Sea. Barter Island is a four-mile wide tundra plateau between the Arey and Kaktovik lagoons. It is also the easternmost village in the North Slope Borough and is 90 miles west of the Canadian border; 120 miles east of Deadhorse, 310 miles east of Utqiagvik, and 382 miles northeast of Fairbanks. The geographic coordinates for Kaktovik are 70° 08’ North and 143° 38’ West (Sec. 13, T09N, R33E, Umiat Meridian).

1.1. Purpose of the Comprehensive Plan

The Kaktovik Comprehensive Plan is a long-range document intended to guide the development of Kaktovik and its Area of Influence (shown in Map 4) over the next twenty years. The plan is a consolidated, cohesive, and coordinated approach to community planning to guide decision making for preservation, investment, and development of future community resources and infrastructure. Community residents, landowners, public officials, and government staff among others participate in the comprehensive planning process.

Upon adoption, this plan will become the primary land use policy document for Kaktovik and thus provide guidance on a variety of long-range planning issues that are critical to the future of the community. It also contains a vision statement for the future and goals, objectives and strategies that are designed to implement that vision.

In addition, this plan provides useful background information about the community and identifies

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community assets, which can be referenced when making community development or land use decisions and when applying for grant funding. Specifically, the plan is intended to:

- Guide growth and development of the community;
- Characterize current strengths, weaknesses, opportunities, and threats of the community;
- Describe what the community residents’ want for the future of the community;
- Provide anticipated capital needs over a 20 year planning horizon;
- Provide the foundation for development proposals comments, land use planning and regulation, investments in infrastructure, and land use policy decisions.

Although the plan has a 20-year planning horizon, conditions, issues, and priorities will undoubtedly change over this period. Regular review and revision of the plan ensures that the goals and strategies respond to changing circumstances and needs within the village and its Area of Influence. To remain current and useful, this plan needs to be reviewed every two years for potential updates and revisions. Future plan revisions should monitor growth, evaluate development and related programs, and measure how well the plan is meeting the community’s goals, objectives, and implementing strategies.

The NSB uses comprehensive plans when evaluating land use proposals or actions specific to a community, including approval of subdivisions, changes to zoning districts, borough permitting, and capital improvement recommendations. The borough will also use this plan to help guide the location, timing, and scale of community development and infrastructure investments. It is also used to plan for community needs based on trends and population projections and to consider the protection of important environmental and cultural resources. The borough may also use this plan to develop mitigation measures as conditions of permit approval.

Federal and state agencies and potential project funders are encouraged to use the plan to understand community values, needs, and priorities for investment. Some funders may only provide project financing if it is listed within or is consistent with policies of an adopted community plan.

Private landowners, developers, and Native corporations may use this plan to help guide development decisions and investment choices. Community data, maps, and policies will help these entities design projects compatible with community values and needs to meet local expectations.

Kaktovik residents can use this plan to advocate for a better future that is consistent with local needs and resources. Infrastructure and level of service planning with population trends also help citizens stretch available funding for more efficient and effective government service. A primary interest for the future development of Kaktovik is to ensure the traditional way of life, protect marine and wildlife habitats, and protect the community from coastal storms and flooding while also considering the potential for energy development.

Ultimately, the plan seeks to conserve valued resources and uses and encourages development that meets the needs of the present population without compromising options for future generations.
1.2. Basis for Comprehensive Planning

Title 29 of the Alaska Statutes provides the authority for comprehensive planning in Alaska. The North Slope Borough is responsible for planning, platting, land use regulations, and development of a borough-wide comprehensive plan. Alaska Statute states that “The comprehensive plan is a compilation of policy statements, goals, standards, and maps for guiding the physical, social, and economic development, both private and public, of the first or second class borough and may include but is not limited to the following:

1. statements of policies, goals, and standards;
2. a land use plan;
3. a community facilities plan;
4. a transportation plan; and
5. recommendations for implementation of the comprehensive plan” (Alaska Statute (AS) §29.40.030).

The NSB Municipal Code (NSBMC), like AS §29.40.030, outlines the process for developing a borough-wide comprehensive plan and the contents of the plan in §2.12.170: “The Comprehensive Plan...shall be a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public, of the borough, and may include, but is not limited to, the following: statements of policies, goals, standards, a land use plan, a community facilities plan, a transportation plan and recommendations for plan implementation.”

The NSBMC also calls for the Planning Commission to consider amendments to the comprehensive plan from time to time (§19.30.050), undertake an overall review of the plan at least once every two years (§2.12.170), and review and report to the Assembly the location, design, construction, demolition, or disposition of any public building, facility, collector or arterial street, park, greenbelt, playground or other public facility based on the comprehensive plan and the capital improvements program (§19.30.050).

The NSB Department of Planning and Community Services (NSB Planning) implements land use planning and regulation for the borough. Its goals include updating, maintaining, and implementing the North Slope Borough Areawide Comprehensive Plan, village comprehensive plans, as well as empowering community-level decision-making in social, economic, and development issues. Through the Community Planning and Development Division, NSB Planning also facilitates the annual capital project request process and develops the NSB Six-Year Capital Improvement Plan that outlines anticipated capital needs over the current year and the next five years.

1.3. Past Planning Efforts

The Kaktovik Comprehensive Plan, adopted by the NSB Assembly on April 7, 2015, was the most recent planning effort in Kaktovik. This was the first long-range planning effort developed specifically for Kaktovik.

Past planning efforts also include the 2005 NSB Areawide Comprehensive Plan that contained community profiles, including a 25-page summary on Kaktovik. The Kaktovik profile provided information on population characteristics, subsistence harvests, land ownership and land use, public infrastructure, community issues, and community priorities. A draft 1993 NSB Comprehensive Plan contains community profiles for each North Slope village.
While the NSB Assembly did not adopt the plan, it remains a historical reference for community information. Similarly, a City of Kaktovik Background for Planning guide was prepared in 1983 by Alaska Consultants, Inc. that documented needs and trends in Kaktovik nearly thirty years ago. A Background for Planning report was also prepared for all the other North Slope villages.

The community of Kaktovik sought the development of a planning-related document in 1991 to represent the thoughts and wishes of the Kaktovikmiut. It is called *In This Place: A Guide for Those Who Would Work in the Country of the Kaktovikmiut, an Unfinished and Ongoing Work of the People of Kaktovik, Alaska.*

*In This Place* provides guidance to outside interests, the oil and gas industry, the government, and environmental groups, in understanding and complying with the wishes of the Kaktovik people. Kaktovik residents assert that they cannot allow uncontrolled activity in their homeland nor depend on other entities in protecting either their interests or their homeland lands and waters. Through this document, the Kaktovikmiut set expectations, not only development within their lands, the narrative that too often is controlled by outside interests.²

### 1.4. Planning Process and Public Involvement

The comprehensive planning process is designed to be transparent and inclusive. The steps for developing this plan are illustrated in Figure 1. It is critical in the development of the Kaktovik Comprehensive Plan that the public have abundant and meaningful opportunities to participate, contribute, and review the draft

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The following public participation methods are used in order to obtain input:

- Public notices posted throughout the village providing notification on meeting dates and locations;
- Provision of informational material during meetings, including comprehensive planning background, maps and process handouts;
- On January 22, 2020, a leadership meeting was held with the City of Kaktovik, Native Village of Kaktovik, and Kaktovik Iñupiat Corporation to introduce the comprehensive plan update process and hold a Strengths, Weaknesses, Opportunities and Threats (SWOT);
- A community workshop, including an introduction to comprehensive planning and SWOT exercise was also held on January 22, 2020;
- Participated in the November 11, 2020 City Council meeting;
- Discussed the draft comprehensive plan update with the Kaktovik Tri-lateral via teleconference at their the November 28, 2020 meeting;
- Meeting and other announcements made on the North Slope Comprehensive Planning Facebook page.

Collaboratively, Kaktovik residents, village leadership, North Slope Borough Planning and Community Services Department staff, other NSB employees that provide services in the village, and the Comprehensive Planning Stakeholder Committee representative for Kaktovik developed this plan. Local village leadership includes the Mayor and City Council members, the Native Village of Kaktovik Tribal Council President and Council members, the President and Board members of the Kaktovik Iñupiat Corporation, and the NSB Planning Commissioner and Alternate Commissioner representing Kaktovik.

### 1.5. Strengths, Weaknesses, Opportunities, Threats Workshops

A Strengths, Weaknesses, Opportunities and Threats Analysis exercise guides a community in identifying its strengths and weaknesses as well as opportunities and threats, which assists with both strategic planning and decision-making. The SWOT exercise is also used to develop the goals, objectives, and implementing strategies found in Chapter 2.

The results of the 2020 community SWOT exercise that was held in Kaktovik with the community at-large on January 22, 2020 are included on the following four pages. The vision statement is in Section 1.7.
Community Strengths

- Subsistence living in and around the area
- Knowledgeable local hunters
- Strong family and traditional values
- Facilities to meet local needs like two stores, health clinic, office, fire hall, school but need more offices and a multipurpose building
- Fall whaling
- Settled 14(c)3 land transfer but the community still needs to know what is public land for city roads around the island and who owns the freshwater lake
- Skilled artists
- Voice of the Arctic
- Landownership and subsurface rights
- Ability to have a trilateral
- Elders and traditional values
- People of Kaktovik, history, traditional land use, and the area of Influence
- Churches
- Post office
- New airport
- First responders and fire department
- Dance group
- Village corporation
- Ilisagvik College
COMMUNITY WEAKNESSES

- Arctic National Wildlife Refuge regulations restrict summer hunting activities
  - Lack of year round access to mainland is a problem
  - Too much regulations
  - Limits food security issues
  - Traditional land use patterns
  - Subsistence access
  - Subsistence use – need hunting permit to access native allotment
- Lack of local hunters and lack of food
- Housing shortage: need upgrades, repairs, abandoned homes are unlivable, pilings need to be fixed
- Lack of jobs
- Losing local culture and language
- Cultural resources are not adequately identified or protected and need a museum
- Lack of facilities for youth
- High transportation costs which contribute to the high cost of fuel and goods. City to work on bypass mail. Lack of alternative transportation overland
- Tourism and other take precedent over freight deliveries
- Polar bear viewing guidelines are not followed by tourists
- Lack of freight delivery
- Polar bear patrol needs more equipment
- Significant decrease in household and per capita income
- First responders and fire department volunteers are needed
- Roads are low, need to be built up higher, lack of funding roads for improvement
- 5 homes not connected to water and sewer
- Need for local oil spill responders
- Lack of mainland access year round
  - Opportunity to build a bridge
- Lack of airline competition
  - Impacts health life and safety
- Senior housing molded
- Lack of youth programs
- Lack of ministers
- Gravel airport, lack of terminal
- Lack of hardware store
- Lack of restaurants
- Lack of behavior health services
Community Opportunities

- Local guides and hunters
- Alternative energy development – natural gas & access / water current energy
- Local business expansion
- Inupiat owned and operated airline
- Economic opportunities relating to ANWR and scientific studies
- Jobs related to Point Thomson oil development
- Museum – add cultural center/ multipurpose facility / heritage center for artifacts
- Arts and crafts
- Identify land
- Bridge connection to mainland for subsistence use
- Ferry system to mainland
- Education for kids
- Cold / food security issues
- As ANWR moves forward, draft policy to create access for local residents
- Education, junior and seniors in high school should take college credits, Ilisagvik tuition is waived for North Slope residents
- To take Inupiaq language classes with Ilisagvik
- Skilled trades needed, training and job opportunities
- Youth groups needed
- New town site in case of emergency and overcrowding
- Opportunities through Arctic Slope Regional Corporation (ASRC) Alaska Growth Capital
COMMUNITY THREATS

- People leaving due to lack of local opportunities
- Climate change resulting in changes to wildlife behavior and island erosion
- Permafrost melting / lost all ice cellars
- ANWR designated Wilderness Area
- Oil exploration and foreign vessels impacting subsistence including whaling with marine traffic, trash, and people.
- Losing traditional culture
- Increased transportation cost leading to increased costs of goods and fuel
- Polar Bear patrol needs new equipment
- Polar bear viewing, community needs to be able to comment and regulate
- Cell service outages for hours at a time
- Lack of communication
- House settling and subsiding, infrastructure damage, and sinkholes
- Negative impacts from social media on whaling
- NGOs threatening our way of life
- Non-governmental organization (NGO) air traffic
- Caribou migrating route by tourist
- Lack of emergency evacuation road, we need a connection to the mainland
- Seeing Russian aircraft flying over Kaktovik
- Coastal erosion and mitigation rate and subsidence
- School is sinking
- }
1.6. Vision Statement

Creating a vision statement for the future of the community is an important part of the comprehensive planning process. Goals, objectives, and implementing strategies are developed to implement the vision that Kaktovik residents want for the future of the community. The following vision statement was created during the development of the 2015 Kaktovik Comprehensive Plan.

Kaktovik is a healthy community where residents value their strong family ties, traditional Iñupiat values, and healthy subsistence living. Residents are good stewards of the environment and protect the waters, lands, and air quality from any degradation or damage so that wildlife is healthy and sustainable and all who live in and visit Kaktovik can continue to enjoy its abundant natural resources, clean waters and air, and a healthy subsistence lifestyle.

Residents pass on traditional knowledge of weather, landforms, biotic and subsistence resources, and hunting methods to new generations and embrace compatible modern technologies, and contemporary knowledge that help residents maintain a healthy, safe and affordable community.

Village leadership promotes a diverse economy supporting local businesses and clean industries that provide resident employment flexible enough to support seasonal subsistence activities.

A variety of adequate safe, sanitary, and affordable housing is available for all ages and income levels, along with quality infrastructure and convenient and reliable community facilities.

Residents promote a healthy lifestyle, an involved citizenry, sharing of resources and knowledge, and community cooperation in decision making to ensure that orderly, well-understood conservation and development occurs in the village and its environs to assure a healthy and sustainable community for generations to come.
1.7. Plan Scope and Organization

Seven goals have been established for the plan that provide the overall direction for the plan’s implementation, shown on the following page. Objectives for each of these goals and associated strategies for reaching those objectives are included in Chapter Two.

This plan is designed so that readers may focus on (a) specific section(s) of interest, versus reading the Plan in its entirety. Chapter one provides introductory material and a context for the goals, objectives, and strategies, which are included in Chapter two along with a discussion of how the plan will be implemented. The references at the end of the plan identify studies, reports and other sources of information consulted while developing this plan. The ten chapters of the plan and appendices are organized as follows:

- **Chapter 1** provides the introduction to the plan, including the basis for comprehensive planning.
- **Chapter 2** includes goals of the plan, related objectives, and actions that will help meet those objectives.
- **Chapter 3** provides an overview of both the local and regional governments involved in the administration of the community as well as a discussion of Kaktovik’s history and language.
- **Chapter 4** includes information on the historical, current, and projected future population of Kaktovik.
- **Chapter 5** provides information the natural environment including the location,
vegetation, wildlife, endangered species, contaminated sites, and climate change.

Chapter 6 includes discussion of the importance of the subsistence lifestyle to community residents.

Chapter 7 examines public facilities, including the water and sewer system, power generation, solid waste, gravel resources, and communications.

Chapter 8 discusses education, health, and the economy in Kaktovik.

Chapter 9 examines housing issues, both current and future needs.

Chapter 10 provides information on land use and zoning in and around the community.

1.8. Consistency with Adopted Plan Policies

The North Slope Borough Comprehensive Plan was adopted in 2019 by the NSB Assembly. Like all comprehensive plans, it is designed to guide future development, programs, and investments that align with a community’s vision. The NSB Comprehensive Plan reflects the values and circumstances of the community of the North Slope. By their mere existence, the 2019 Plan, as well as its previous iterations have also furthered local self-determination for control of North Slope land and resources.

The North Slope Borough Comprehensive Plan provides guidance on community development issues at the borough level. Each of the eight NSB communities have a village comprehensive plan that represents issues, needs, and interests at the local level. Each of the plans are stand-alone documents. Yet there is consistency across planning documents.

This section has select village planning and development implementing strategies taken from the adopted North Slope Borough Comprehensive Plan to illustrate that the NSB’s long range planning documents and specifically the implementing strategies align with the local village plans, including with this Kaktovik Comprehensive Plan.

Land Use

- Protect subsistence corridors and hunting and fishing areas through the development of a subsistence zoning district. [Implementing Strategy 1.1.5, page 384]
- Ensure inclusion of villages in the notification and decision-making process before permits are issued [Implementing Strategy 1.1.6, page 384]
- Develop cooperative agreements between landowners, cities, NSB, and state and federal regulatory agencies to coordinate land development funding and logistics. [Implementing Strategy 1.2.3, page 385]
- Coordinate closely with state and federal regulators to ensure that village residents’ concerns are considered and addressed in oil and gas development proposal [Implementing Strategy 1.2.4, page 385]
- Increase partnerships between NSB, Tribal and city governments, and Native corporations. [Implementing Strategy 1.2.5, page 385]
- Establish a committee, potentially composed of Planning Commissioners, residents, NSB Mayor’s Office and NSB Planning & Community Services Department staff, and
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- Increase partnerships between NSB, Tribal and city governments, and Native corporations. [Implementing Strategy 1.2.5, page 385]
- Establish a committee, potentially composed of Planning Commissioners, residents, NSB Mayor’s Office and NSB Planning & Community Services Department staff, and
Actively participate in and promote public review and input into the writing, review, and approval of any transportation or utility corridors, plans, or routes undertaken by the borough, state, or federal government within the NSB. [Implementing Strategy 4.2.1, page 392]

**Iñupiaq Language and Subsistence**

- Require that master plans, rezonings, and applicable permits incorporate aspects of traditional and contemporary local knowledge into a project’s planning and design. [Implementing Strategy 5.1.7, page 393]
- Recognize the importance of traditional camps and cabins, and associated subsistence activities when managing public and planning for leasing, exploration, and development of petroleum and mineral resources. [Implementing Strategy 5.2.1, page 394]
- Encourage more research and coordination on studying and mitigating any potential effects of future road corridors on caribou migration. [Implementing Strategy 5.2.5, page 394]
- Encourage oil companies to allow subsistence users access to oil fields roads and to limit public access. [Implementing Strategy 5.2.6, page 394]
- Develop formal agreements between landowners and land managers to provide subsistence access across private, state, and federal lands. [Implementing Strategy 5.2.9, page 395]

**Economic Development**

- Investigate burgeoning employment opportunities due to improved fiber optic communications. [Implementing Strategy 6.1.5, page 395]
- Continue to invest in creating childcare centers in all North Slope communities to assist working parents. [Implementing Strategy 6.1.9, page 396]

**Public Infrastructure and Services**

- Facilitate shared use of village facilities to benefit all village residents, such as community use of school swimming pool and other recreational space. [Implementing Strategy 7.1.4, page 397]
- Evaluate alternative options to gravel to aid in fulfilling community gravel needs. [Implementing Strategy 7.1.12, page 397]
- Assist local efforts to secure search and rescue facility space in the villages. [Implementing Strategy 7.2.7, page 398]

**Partnerships**

- Investigate the need and feasibility to establishing an additional service area to support expansion into ANWR 1002 Area for new oil exploration and production. [Implementing Strategy 8.1.1, page 398]
- Maintain good neighbor policies and conflict avoidance agreements: maintain access to subsistence areas. [Implementing Strategy 8.2.1, page 399]
- Maintain good neighbor policies and conflict avoidance agreements: Encourage input from affected residents on contents of agreements. [Implementing Strategy 8.2.2, page 399]
- Incorporate local concerns and suggestions in exploration permit approvals and denials, and document measure that have been successful or unsuccessful. [Implementing Strategy 8.3.4, page 399]
Energy

- Construct redundant energy development and distribution to ensure continuity of service. [Implementing Strategy 9.1.4, page 400]
- Cultivate partnerships with public/private development to foster development that would provide connection to regional power. [Implementing Strategy 9.2.2, page 400]
- Implement a program to regularly inspect and weatherize buildings for maximum energy savings. [Implementing Strategy 9.3.2, page 400]
- Utilize waste heat recovered from community power generation. [Implementing Strategy 9.3.3, page 400]

Environment

- Coordinate with resource agencies to identify and map watersheds, wetlands, and traditional trails in the North Slope Borough that are important for subsistence. [Implementing Strategy 10.1.1, page 401]
- Evaluate existing zoning and land use regulations for effectiveness in protecting sensitive areas, including establishing a zoning district(s) specifically for subsistence and/or special habitats. [Implementing Strategy 10.1.2, page 401]

Education

- Continue developing daycare centers in the villages to offer a strong academic foundation through pre-kindergarten education. [Implementing Strategy 11.2.4, page 402]
- Improve Native language fluency through partial or full immersion programs from pre-kindergarten through high school. [Implementing Strategy 11.3.3, page 403]
- Encourage the North Slope Borough School District and educators to further incorporate traditional and cultural values throughout the school curricula. [Implementing Strategy 11.3.5, page 403]
- Integrate Elders into school activities through shared lunches, invitations to speak with classes, and involvement in student projects. [Implementing Strategy 11.3.6, page 403]

Social Services

- Seek increased access to recreational facilities in the villages, especially at the schools, to promote physical activity. [Implementing Strategy 12.1.1, page 404]
- Focus resources on providing for the aging population as this group increases. [Implementing Strategy 12.4.1 page 405]

1.9. Plan Updates and Revisions

The Kaktovik Comprehensive Plan is intended to be a living document. Because situations change, the goals, objectives, and strategies in this chapter should be updated to reflect current priorities and opportunities. The community may wish to update the goals, objectives, and strategies each year as part of developing an annual work plan and priorities for capital projects.

This plan is a guide that provides direction for the village leadership when collaborating with the NSB, state and federal agencies, and other organizations. Generally, comprehensive plans have a 20-year planning horizon, and ideally, they are reviewed every two years for potential updates and updated as a matter of procedure every five years. Regularly updating the goals, objectives, and strategies will make it easier to complete the next update of the entire plan.
Chapter 2
Goals, Objectives & Strategies

A comprehensive plan’s vision statement and goals are critical to effective long range planning. Translating the vision statement and goals into implementable actions is the hallmark of comprehensive planning. In this plan, each goal is accompanied by one or more objectives that suggest how the community might achieve the intent and substance of its goal. Each objective is followed by one or more strategies that describe how the action could be implemented. Implementing strategies may establish how a specific course of action could be accomplished by village residents, village leadership, NSB Administration and staff, NSB legislators, development permitting and funding agencies, and/or other entities. For many of the strategies, the community is responsible for initiation and seeking assistance from other entities.

Because this comprehensive planning effort reflects concerns and issues confronting the community overall, the goals presented here are not in priority order.

Village leadership participating in and contributing to the formation of the plan’s development include members of the Kaktovik City Council, the Kaktovik Tribal Council, Kaktovik Iñupiat Corporation Board Members, village Elders, hunters, local North Slope Borough School District (NSBSD) staff, and NSB staff providing services in the village. However, in reference to the following implementation strategies, village leadership generally refers to the Kaktovik City Council, Native Village of Kaktovik Tribal Council, and Kaktovik Iñupiat Corporation Board Members. In some cases, not all of the village leadership entities will be involved in the implementation strategy due to expertise or capacity. The North Slope Borough Planning & Community Services Department’s Community Planner is available to assist the Kaktovik community in implementing the goals included in this plan.

**Goals**
are broad statements that describe long-term desired outcomes.

**Objectives**
provide more specific information of what can be done to achieve a goal.

**Implementing Strategies**
describe specific steps that can be taken to reach an objective.
Goal One

Collectively prepare for future natural resource development and associated land uses to protect the natural environment and subsistence lands.

The likelihood of natural resource development in the Arctic National Wildlife Refuge has increased more in the last two years than it has in the last three decades. However, natural resource development and extraction on public lands is often political and contentious. Administrative changes at the federal level could delay leasing for the near-term and potentially longer than that. Regardless of the immediate prospect of development, it is essential to protect both the environment and subsistence access. Protecting the natural environment is important for both sustaining the Kaktovikmiut’s subsistence needs and for its own intrinsic value.

Objective One

Use updated and comprehensive data about the natural environment to support informed decision-making and establish regulatory and policy measures to protect the natural environment when and where possible.

1. Seek baseline scientific data on sensitive natural environments such as wetlands and vegetation and critical habitats / nesting areas of threatened and endangered species, air quality, water quality, etc.  

   Responsible Party: NVK  
   Assistance From: NSB Wildlife

2. Document current and historical traditional knowledge of wildlife habitat, migratory patterns, weather, ice conditions, etc., and communicate that knowledge to NSB, state and federal resource management agencies and appropriate private entities.  

   Responsible Party: NVK  
   Assistance From: NSB Wildlife

3. Document significant environmental concerns including accelerated erosion, foreign vessel sightings, ocean dumping, tundra fires, invasive species, expanding or reducing freshwater lakes, rapid changes to wildlife populations, etc. occurring within the Kaktovik area of influence and select a person or position in the community to be the keeper of this record. Use the record to secure funding for scientific research and for future Comprehensive Plan updates.  

   Responsible Party: NVK  
   Assistance From: NSB Wildlife

   City of Kaktovik KIC
**Objective One (continued)**

Use updated and comprehensive data about the natural environment to support informed decision-making and establish regulatory and policy measures to protect the natural environment when and where possible.

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<tr>
<th>Objective</th>
<th>Responsible Party</th>
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<tr>
<td>4. Advocate for research and coordination on studying and mitigating any potential effects of future natural resource extraction activities on migration patterns.</td>
<td>NVK</td>
<td>NSB Wildlife</td>
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<tr>
<td>5. Seek research on the effect of invasive species as the Arctic experiences increased maritime traffic.</td>
<td>NVK</td>
<td>NSB Wildlife</td>
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<td>6. Review and recommend modification to the North Slope Borough Municipal Code as needed to further protect subsistence lands, including establishing a subsistence zoning district.</td>
<td>NVK</td>
<td>NSB Planning</td>
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**Objective Two**

Seek effective and consistent coordination and communication regarding potential future industry activities in the coastal plain.

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<th>Objective</th>
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<tbody>
<tr>
<td>1. Provide guidance to industry and its contractors on the education that should be provided to non-borough residents that travel to the region about subsistence resources and how to minimize their impact to these resources.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Planning</td>
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<tr>
<td>2. Review <em>In This Place: A Guide for Those Who Would Work in The Country of the Kaktovikmiut</em> and update or supplement as needed to provide clear communication on Kaktovik residents’ needs and expectations of future development.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Planning</td>
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<tr>
<td>3. Coordinate with permitting agencies and NSB to require industry to present projects, activities, and findings regularly to the community.</td>
<td>NVK City of Kaktovik KIC</td>
<td>BLM NSB Planning</td>
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<tr>
<td>4. Develop formal agreements between landowners and land managers to provide subsistence access across private, state, and federal lands.</td>
<td>NVK</td>
<td>DNR USFWS BLM NSB Planning</td>
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Objective Two (continued)
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5. Coordinate closely with NSB, state, and federal regulators to ensure that village residents’ concerns are considered and addressed in any future oil and gas development proposals.

6. Work with NSB and permitting agencies to include stipulations to minimize activities that have the potential to disturb wildlife and that alert residents before wildlife-disturbing activities take place.

7. Vigorously pursue inclusion in the notification and decision-making process for projects within the area of influence before permits are issued.

8. Establish a committee or other mechanism to exchange information and lessons learned with the Nuiqsut community leadership.

Objective Three
Remediate contaminated sites within the community and the area of influence.

<table>
<thead>
<tr>
<th>Responsible Party</th>
<th>Assistance From</th>
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<tbody>
<tr>
<td>Native Village of Kaktovik</td>
<td>ADEC</td>
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<tr>
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<td>DOD</td>
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<td>NSB</td>
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</tbody>
</table>

1. Coordinate with NSB, the State of Alaska, and the federal government on outstanding contaminated sites in the Kaktovik area and seek remediation funding. (see Table 25 in Chapter 10: Land Use and Zoning)
Goal Two
Preserve Iñupiaq traditions and cultural activities.

Subsistence is a way of life for a majority of residents in Kaktovik. It is critical that both traditional knowledge and natural resources are protected for current and future generations. Traditional knowledge includes hunting, fishing, and gathering, an understanding of the land, air, and waters.

### Objective One
Preserve the Iñupiat culture and the traditional lifestyle.

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<thead>
<tr>
<th>Responsible Party</th>
<th>Assistance From</th>
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<tbody>
<tr>
<td>NVK</td>
<td>IHLC</td>
</tr>
</tbody>
</table>

1. Incorporate the Iñupiat Heritage, Language, and Culture (IHLC) Department oral historian(s) in documenting and promoting the history and culture of the community.

2. Continue to teach traditional values to new generations by focusing on how traditional and cultural values assist in residents’ successes.

### Objective Two
Protect subsistence rights and activities.

<table>
<thead>
<tr>
<th>Responsible Party</th>
<th>Assistance From</th>
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</thead>
<tbody>
<tr>
<td>NVK</td>
<td>NSBSD ADF&amp;G NSB Wildlife NSB Planning</td>
</tr>
</tbody>
</table>

1. Actively include the community’s youth to learn about land use regulations, protecting subsistence rights, land management, and interfacing with regulatory entities.

2. Work with the Alaska Department of Fish and Game and state and federal land managers to reduce effects on subsistence activities from outside sport and commercial hunting and fishing activities.

3. Request free annual and biannual Alaska Department of Fish and Game regulations books and Federal Subsistence Management Regulations for the Harvest of Wildlife on Federal Public Lands in Alaska for all school children. Request free training and educational opportunities provided by the Department of Fish and Game and Federal Subsistence Management Board.
## Objective Two (continued)

**Protect subsistence rights and activities.**

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<tbody>
<tr>
<td><strong>4.</strong></td>
<td>Work with NSB Wildlife Management Department staff to ensure that NSB and local hunters’ voices are present at federal and state agency meetings to support the continued hunting of subsistence wildlife within the Kaktovik area of influence.</td>
<td>NVK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ADF&amp;G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>USFWS</td>
</tr>
<tr>
<td><strong>5.</strong></td>
<td>Work with state and federal agencies to monitor, and when necessary, contribute to proposed state and federal government agency changes to hunting regulations that may be applied to residents (e.g. number and length of permits, limit changes, access limits, and other new restrictions or lessening of restrictions that may occur as a result of changes to wildlife population numbers or behaviors). Voice the need for simplification of hunting regulations within ANWR for Kaktovik residents and for increasing take limits.</td>
<td>NVK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ADF&amp;G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>USFWS</td>
</tr>
<tr>
<td><strong>6.</strong></td>
<td>Engage with the Federal Subsistence Management Board by nominating one or more Kaktovik residents to serve on the North Slope Subsistence Regional Advisory Council and by preparing a template letter from the community to review and send biannually as Federal Subsistence Harvest Regulations are being drafted.</td>
<td>NVK</td>
</tr>
<tr>
<td><strong>7.</strong></td>
<td>Coordinate with NSB Wildlife Management Department staff to provide current information on wildlife populations to federal and state agencies to support the continued hunting of subsistence wildlife within the Kaktovik area of influence.</td>
<td>NVK</td>
</tr>
<tr>
<td><strong>8.</strong></td>
<td>Continue to seek funding to replace failed ice cellars through grant writing and corporate sponsorship.</td>
<td>NVK</td>
</tr>
</tbody>
</table>
## Objective Three
Facilitate preservation of the Iñupiaq language through improving Native language fluency.

<table>
<thead>
<tr>
<th></th>
<th>Objective Description</th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Establish a daycare center that includes an Iñupiat language immersion program.</td>
<td>City of Kaktovik NVK</td>
<td>NSB Health IHLC</td>
</tr>
<tr>
<td>2</td>
<td>Encourage Native speakers to speak Iñupiaq at home, especially to children.</td>
<td>NVK</td>
<td>IHLC</td>
</tr>
<tr>
<td>3</td>
<td>Advocate for expanding the NSBSD Iñupiaq Immersion Program.</td>
<td>NVK</td>
<td>NSBSD Kaveolook School</td>
</tr>
<tr>
<td>4</td>
<td>Continue and expand the use of the Rosetta Stone program for language preservation and develop Native language education programs for adults.</td>
<td>NVK</td>
<td>IHLC</td>
</tr>
<tr>
<td>5</td>
<td>Develop a program to pair young children with fluent speakers to speak only in Iñupiaq, especially in cultural activities and teaching subsistence.</td>
<td>NVK</td>
<td>IHLC</td>
</tr>
<tr>
<td>6</td>
<td>Use games to promote language learning.</td>
<td>Kaveolook School</td>
<td>NSBSD</td>
</tr>
</tbody>
</table>
Goal Three

Maintain, protect, and expand community facilities and infrastructure.

Kaktovik has a significant amount of network infrastructure, community facilities, and transportation systems, including a gravel road network, piped water and sewer systems, electric power, and an airport runway. It is important to maintain this infrastructure and expand when needed for resident quality of life.

**Objective One**
Continue to maintain water, sewer, electric power, and other facilities in good operating condition.

<table>
<thead>
<tr>
<th>Identify utilities and community facilities that may be vulnerable to damage caused by climate-related impacts including melting permafrost, fire, erosion, and/or flooding and consider appropriate action(s).</th>
<th>City of Kaktovik</th>
<th>NSB Public Works</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSB and community leadership form and maintain an active Local Emergency Planning Committee (LEPC) to manage hazard mitigation planning and preparedness. The Committee will monitor, update as needed, and implement the Hazard Mitigation Plan to prepare for and respond to flooding, fires, pests, and other hazards.</td>
<td>City of Kaktovik</td>
<td>NSB Risk Management</td>
</tr>
<tr>
<td>As practicable, locate, design, and construct needed community facilities, such as snow fences or landfill sites, in such a way as to avoid conflicts with wildlife habitats and migration periods and patterns.</td>
<td>NSB Public Works NSB CIPM</td>
<td>City of Kaktovik</td>
</tr>
<tr>
<td>Develop a village-specific adaptation plan identifying hazards associated with the thawing of permafrost in and near the village and other climate-related impacts on the environment that are likely to affect community infrastructure with options for remedying impacts or avoiding these hazards.</td>
<td>City of Kaktovik</td>
<td>NSB Risk Management</td>
</tr>
</tbody>
</table>
**Objective Two**
Maintain and improve the transportation network.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The NSB will work with village leadership to seek a long lasting, cost-effective road hardener system to mitigate dusty roads during summer months that can contaminate drying fish and meat.</td>
<td>City of Kaktovik</td>
<td>NSB Public Works, NSB CIPM</td>
</tr>
<tr>
<td>2. Examine roads where safety could be improved through signage and will install signs where needed.</td>
<td>Native Village of Kaktovik, City of Kaktovik</td>
<td>NSB Public Works, NSB CIPM</td>
</tr>
<tr>
<td>3. Examine culverts and maintain adequate drainage of all residential properties, especially during and after spring ice breakup. Seek to keep materials on-hand to maintain or repair culverts as-needed.</td>
<td>Native Village of Kaktovik, City of Kaktovik</td>
<td>NSB Public Works, NSB CIPM</td>
</tr>
<tr>
<td>4. Investigate additional funding opportunities for additional road and utility development from Bureau of Indian Affairs, State of Alaska, Denali Commission, the U.S. Department of Housing and Urban Development, and federal transportation funds.</td>
<td>Native Village of Kaktovik</td>
<td>NSB Public Works, NSB Grants Division</td>
</tr>
<tr>
<td>5. Investigate the feasibility of providing regularly scheduled public transportation services and actively pursue NSB Capital Improvement Program funding for a senior van / community bus.</td>
<td>Native Village of Kaktovik</td>
<td>NSB Public Works, NSB Health</td>
</tr>
<tr>
<td>6. Proactively engage with NSB and the State of Alaska Department of Transportation and Public Facilities (DOT&amp;PF) on planned projects, project prioritization, policies, and studies.</td>
<td>Native Village of Kaktovik</td>
<td>NSB Public Works</td>
</tr>
</tbody>
</table>
**Objective Three**  
Seek the expansion and upgrade of infrastructure where needed.

<table>
<thead>
<tr>
<th></th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
</table>
| 1. | Work with the Arctic Slope Telephone Association (ASTAC) to seek improved telecommunication services. | City of Kaktovik | NSB Public Works  
NSB CIPM  
NSB Grants |
| 2. | Identify land suitable for alternative energy systems and will pursue funding for design and development. | City of Kaktovik  
KIC | NSB Public Works  
NSB CIPM  
NSB Grants |
| 3. | Secure a search and rescue facility space in the village. | City of Kaktovik  
KIC | NSB Public Works  
NSB CIPM  
NSB Search & Rescue |
| 4. | Seek funding to install wind-diesel power system. | City of Kaktovik  
KIC | NSB Public Works  
NSB CIPM  
NSB Grants |
Goal Four
Support housing quality, variety, and affordability

Safe, healthy, stable, and access to housing are important factors in quality of life. There is a severe housing shortage across the North Slope, with multiple generations of families living in overcrowded conditions. Additionally, many homes need weatherization improvements, basic home repairs, and air quality assessments to ensure healthy living conditions. Yet these assessments and repairs are difficult to obtain in a remote village like Kaktovik.

**Objective One**
Seek comprehensive understanding of housing issues.

1. Undertake a lot-by-lot study to determine ownership status issues, safety needs, viability of property to be used for infill housing as appropriate, etc.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA

2. Assess the need for housing resources to support those with unexpected housing events or conditions.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA

**Objective Two**
Coordinate housing-related activities and resources.

1. Prepare one housing plan for Kaktovik as a resource for multiple agencies to ensure housing is available for all levels and income brackets.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA

2. Establish a mechanism to advocate for ongoing state, federal and private funding support for housing using partnerships at the local and regional level.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA

3. Analyze existing housing programs and efforts within different entities to determine gaps and duplicative efforts.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA

4. Set up a housing coordination committee comprised of, for example, village leadership, homeowners, TNHA, etc. to coordinate housing activities.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA

5. Promote financial literacy programs offered by TNHA, lenders, and non-profits that help prepare residents for homeownership.
   - Responsible Party: City of Kaktovik
   - Assistance From: NVK, NSB Housing, TNHA
**Objective Three**

Seek ways to reduce costs of constructing housing to facilitate greater affordability and alleviate overcrowding.

1. Encourage, support, and seek funding sources to construct multi-family buildings, accessory residential dwellings, etc. to alleviate the overcrowded conditions and provide more affordable options through the designation of specific locations for these buildings.  
   - Responsible Party: City of Kaktovik NVK  
   - Assistance From: NSB Housing TNHA

2. Research the feasibility of ordering, delivering, and assembling pre-cut kit houses or modular houses.  
   - Responsible Party: City of Kaktovik NVK  
   - Assistance From: NSB Housing TNHA

3. Explore funding opportunities for tribal housing authorities, elder housing, and low-income housing, such as federal and state grants.  
   - Responsible Party: City of Kaktovik NVK  
   - Assistance From: NSB Housing TNHA AHFC HUD

**Objective Four**

Seek quality housing through new construction and renovations.

1. Seek grant funds to further support retrofit weatherization efforts like the former NSB RELI Program (Residential and Employment Living Improvement), passive ventilation systems, and other alternative building techniques to reduce energy consumption in existing houses and reduce costs for homeowners.  
   - Responsible Party: City of Kaktovik Native Village of Kaktovik  
   - Assistance From: NSB Housing TNHA NSB Public Works NSB CIPM AHFC HUD

2. Identify homes that may be vulnerable to damage from thawing permafrost, fire, erosion, and/or flooding and consider appropriate mitigating action(s).  
   - Responsible Party: City of Kaktovik Native Village of Kaktovik  
   - Assistance From: NSB Housing TNHA NSB Public Works NSB CIPM

3. Investigate the feasibility of a program that provides housing maintenance assistance for homeowners, especially elders, and sells supplies for housing maintenance at or near cost to facilitate affordability.  
   - Responsible Party: City of Kaktovik Native Village of Kaktovik  
   - Assistance From: NSB Housing TNHA NSB Public Works NSB CIPM
Goal Five

**Maintain and expand community services to provide improved care for residents.**

To facilitate both physical and social well-being, space for activities and social gatherings is needed. Quality social services, health care services, and community preparedness are essential to the overall wellbeing of the community.

### Objective One
Facilitate the development of facilities that provide opportunities for sustaining culture and improving health.

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<th>Responsible Party</th>
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<td>NVK</td>
<td>NSB Grants</td>
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<td>IHLC</td>
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<td>USFWS</td>
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</table>

1. Seek funding for a cultural center.

### Objective Two
Plan for current and future health and social service needs.

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<th>Responsible Party</th>
<th>Assistance From</th>
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</thead>
<tbody>
<tr>
<td>City of Kaktovik</td>
<td>NSB CIPM</td>
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<td>NSB Health</td>
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</table>

1. Schedule regular evaluation and assessment of clinic facility and equipment.

Investigate the feasibility of hosting visiting doctors to provide health care in-person, especially near the beginning of the school year to conduct annual physicals for students.

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<th>Responsible Party</th>
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<tr>
<td>City of Kaktovik</td>
<td>NSB Health</td>
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<td>NSBSD</td>
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</table>

Investigate the options for both mental and physical health support and resources, such as traveling therapists, teleconference or video appointments, and making sure mental health information and resources are readily available at the health clinic.

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<tr>
<td>City of Kaktovik</td>
<td>NSB Health</td>
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</table>
### Objective Three
Ensure effective community emergency preparedness.

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<tr>
<th>Objective</th>
<th>Responsible Party</th>
<th>Assistance From</th>
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</thead>
<tbody>
<tr>
<td>1. Coordinate hazard vulnerability assessments with the NSB.</td>
<td>City of Kaktovik NVK</td>
<td>NSB Risk Management, NSB Public Works, NSB CIPM, NSB Planning</td>
</tr>
<tr>
<td>2. Seek funding for the purchase of additional polar bear patrol equipment and volunteer search and rescue equipment and facility renovations to strengthen operations.</td>
<td>City of Kaktovik NVK</td>
<td>NSB Grants Division, NSB Search &amp; Rescue CIPM</td>
</tr>
<tr>
<td>3. Disseminate information and tools, such as family disaster supply kit contents, to residents and business about disaster preparedness to protect both people and assets.</td>
<td>City of Kaktovik NVK</td>
<td>KIC NSB Risk Management</td>
</tr>
<tr>
<td>4. Prepare for disruptions to the healthcare, travel, and delivery of goods to the community.</td>
<td>City of Kaktovik NVK</td>
<td>NSB Risk Management, NSB Mayor’s Office</td>
</tr>
<tr>
<td>5. Designate space to function as emergency or quarantine housing.</td>
<td>City of Kaktovik NVK KIC</td>
<td>NSB Risk Management, NSB Mayor’s Office</td>
</tr>
<tr>
<td>6. Encourage families to prepare for disasters with contingency plans for child and Elder care.</td>
<td>City of Kaktovik NVK KIC</td>
<td>NSB Risk Management, NSB Mayor’s Office</td>
</tr>
<tr>
<td>7. Assess Kaktovik’s vulnerability to disruptions in airline service.</td>
<td>City of Kaktovik</td>
<td>NVK KIC NSB PW NSB Mayor’s Office NSB Planning</td>
</tr>
</tbody>
</table>
Goal Six

Develop a strong and resilient local economy.

While industry employs relatively few North Slope residents, revenue from property taxes on oil and gas infrastructure make up a substantial portion of the NSB operating budget. Training local residents and seeking new economic planning and development opportunities are critical to furthering the borough’s economic development goals.

It is important to both prepare students to become community leaders and to be qualified for employment opportunities. The purpose of this goal and its associated objectives is to facilitate educational opportunities within the village, especially those that foster leadership and civic mindedness.

Objective One

Facilitate the establishment of businesses and services and employment opportunities.

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<tr>
<th>Responsible Party</th>
<th>Assistance From</th>
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<tbody>
<tr>
<td>City of Kaktovik</td>
<td>NSBSD</td>
</tr>
<tr>
<td>NVK</td>
<td>Ilisagvik College</td>
</tr>
<tr>
<td>KIC</td>
<td>Mayor’s Office</td>
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<td>DCCED</td>
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</table>

Engage in efforts to create a trained local workforce, including collaborative efforts with Ilisagvik College and the State of Alaska, through education, training, and certification program to residents who seek to learn construction trades, vehicle repair, and maintenance skills, and other service and repair skills that are useful to have available locally. If natural resource exploration intensifies, work closely with industry to train local residents to fill positions in the future.

Work with the NSB Planning department during the master plan process to require local hire and Kaktovik subsistence advisors be employed when projects are within the area of influence, or an alternative specified distance from the community.

Investigate burgeoning employment opportunities that may benefit the community when improved telecommunications provide a more stable and reliable connection.
### Objective One (continued)
Facilitate the establishment of businesses and services and employment opportunities.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Party</th>
<th>Assistance From</th>
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<tbody>
<tr>
<td>4.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Health</td>
</tr>
<tr>
<td></td>
<td>Coordinate funding, facility, and resourcing needs with NSB on developing a childcare center to assist working parents.</td>
<td></td>
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<tr>
<td>5.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Grants DCCED</td>
</tr>
<tr>
<td></td>
<td>Seek funding for an economic development plan and program to identify new potential business and job opportunities based on local resources.</td>
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<tr>
<td>6.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Grants</td>
</tr>
<tr>
<td></td>
<td>Seek funding to establish workspaces for locals to operate businesses, such as vehicle repair shop/space.</td>
<td></td>
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<tr>
<td>7.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Grants</td>
</tr>
<tr>
<td></td>
<td>Establish a village storefront to loan equipment and tools and offer home repair technical assistance.</td>
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</table>

### Objective Two
Strengthen and develop programs and policies to manage local tourism.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Grants Division DCCED</td>
</tr>
<tr>
<td></td>
<td>Study successful polar bear viewing programs to potentially replicate aspects in Kaktovik.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>NVK City of Kaktovik KIC</td>
<td>DCCED</td>
</tr>
<tr>
<td></td>
<td>Work with State of Alaska to increase municipal funding focused on managing the influx of visitors.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Planning</td>
</tr>
<tr>
<td></td>
<td>Partner with the North Slope Borough to update regulations for land-based tourism.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>NVK City of Kaktovik KIC</td>
<td>USFWS</td>
</tr>
<tr>
<td></td>
<td>Coordinate with the U.S. Fish and Wildlife Service to implement measures to better manage the water-based tourism permitting system, potentially implement a web-based reservation system, and lift the freeze on new water-based tour operators.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>NVK City of Kaktovik KIC</td>
<td>USFWS</td>
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<tr>
<td></td>
<td>Continue and strengthen requirements to ensure that boat captains are capable and experienced and that boats are safe.</td>
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</table>
### Objective Two (continued)

Strengthen and develop programs and policies to manage local tourism.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Party</th>
<th>Assistance From</th>
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<tbody>
<tr>
<td>6.</td>
<td>NVK City of Kaktovik</td>
<td>USFWS</td>
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<tr>
<td>7.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Grants NSB Mayor’s Office</td>
</tr>
</tbody>
</table>

### Objective Three

Provide educational resources that prepare students for entering the workforce.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB HR NSBSD Ilisagvik College</td>
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<tr>
<td>2.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB HR NSBSD Ilisagvik College</td>
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<tr>
<td>3.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Mayor’s Office</td>
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<td>4.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB HR Ilisagvik College NSBSD</td>
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<tr>
<td>5.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB HR NSBSD Ilisagvik College</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>NVK City of Kaktovik</td>
<td>NSB HR NSBSD Ilisagvik College</td>
</tr>
</tbody>
</table>
Goal Seven

Seek meaningful intergovernmental and community cooperation and resident participation in decision-making for betterment of all village residents.

Village leadership seeks to collaboratively work to improve the quality of life for all residents. The purpose of this goal and its associated objectives is to facilitate opportunities within the village for meaningful public engagement and leadership cooperation.

### Objective One
Facilitate greater coordination amongst leadership entities.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Promote formal and informal intergovernmental cooperation and agreements between the Native Village of Kaktovik, Kaktovik Iñupiat Corporation, City of Kaktovik, ASRC, NSB, and state and federal government for accomplishing common goals, providing a service or solving mutual problems.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Mayor’s Office ASRC Federal, state governmental agencies as applicable</td>
</tr>
<tr>
<td>2.</td>
<td>Formally establish a Kaktovik tri-lateral committee comprised of the City of Kaktovik, Native Village of Kaktovik, and Kaktovik Iñupiat Corporation.</td>
<td>NVK City of Kaktovik KIC</td>
<td>N/A</td>
</tr>
<tr>
<td>3.</td>
<td>Work together with NSB staff to provide training and support to local meaningful engagement. These trainings could include ensuring representatives from Kaktovik leadership are kept up-to-date on the land development review process.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Mayor’s Office NSB Planning</td>
</tr>
<tr>
<td>4.</td>
<td>Seek improved Kaktovik representation on the North Slope Borough Assembly through the creation of an additional Assembly seat dedicated to Kaktovik.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Mayor’s Office</td>
</tr>
<tr>
<td>5.</td>
<td>Ensure that the NSB Village Deputy for Kaktovik is involved in local initiatives and is provided training for effective involvement in a multitude of issues facing the community. Work with the Village Deputy and other borough staff in the community to disseminate information to residents, especially related to capital investments.</td>
<td>NVK City of Kaktovik KIC</td>
<td>NSB Mayor’s Office</td>
</tr>
</tbody>
</table>
### Objective Two

Encourage increased understanding of land use planning and related public processes in order to facilitate community and intergovernmental cooperation.

<table>
<thead>
<tr>
<th></th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Mayor’s Office</td>
</tr>
<tr>
<td></td>
<td>KIC</td>
<td>NSB Planning NSBSD</td>
</tr>
</tbody>
</table>

Encourage youth and other residents to attend meetings where governance, capital infrastructure planning, land use planning, and land use permitting is discussed to gain a better understanding of how land use and land management affects the community.

Collaborate to develop curricula for middle and high school students to understand land use, planning, and the relationship of federal, state, and local regulatory agencies to their community’s current and future health and well-being. Encourage active participation in current Federal and State land planning meetings for the North Slope of Alaska and Kaktovik area.

<table>
<thead>
<tr>
<th></th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Mayor’s Office</td>
</tr>
<tr>
<td></td>
<td>KIC</td>
<td>NSB Planning NSBSD</td>
</tr>
<tr>
<td></td>
<td>Kaveolook School</td>
<td>BLM USFWS</td>
</tr>
</tbody>
</table>

Seek continued guidance and training on pursuing project or program funding, including the NSB Capital Program.

<table>
<thead>
<tr>
<th></th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Planning NSB CIPM</td>
</tr>
</tbody>
</table>

Work collaboratively on researching and submitting funding proposals for community projects.

<table>
<thead>
<tr>
<th></th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Grants</td>
</tr>
</tbody>
</table>

### Objective Three

Promote volunteerism.

<table>
<thead>
<tr>
<th></th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NVK City of Kaktovik</td>
<td>NSB Mayor’s Office</td>
</tr>
</tbody>
</table>

Develop and implement a volunteering plan that could include type and extent of community needs; required skills; resources needed to implement a volunteer program; methods to organize, train, and manage volunteers; ways to promote volunteerism within the community; and identify potential partners.
### Objective Four
Prepare students to be community leaders.

<table>
<thead>
<tr>
<th>1.</th>
<th>Encourage student programs that foster leadership skills, such as student council and peer-mentoring activities.</th>
<th>Responsible Party</th>
<th>Assistance From</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kaveolook School</td>
<td>NSBSD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NVK City of Kaktovik</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>KIC NSB Mayor's Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Develop a sense of citizenship and ownership in the community through student participation in community projects, such implementing this comprehensive plan and promoting volunteerism for the betterment of the community.</td>
<td>NVK City of Kaktovik</td>
<td></td>
</tr>
<tr>
<td></td>
<td>KIC NSB Planning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**3.1. Governance and Leadership**

Kaktovik is represented by municipal and tribal governments, both local and regional. Each of these four governmental organizations are described below.

**City of Kaktovik.**

The City of Kaktovik incorporated in 1971 as a second class city and is a subdivision of the North Slope Borough and the State of Alaska. The seven members of the City Council are elected at-large and the Mayor is elected by the Council. The Mayor leads the City Council and is responsible for day-to-day management of city operations.

**Native Village of Kaktovik.**

The seven-member Native Village of Kaktovik (NVK) Tribal Council governs the Native Village of Kaktovik, a federally recognized tribe. NVK was established under authority of the Indian Reorganization Act (IRA) of 1934. A federally recognized Indian tribal government and its political subdivisions, including Alaska Native governments like the Native Village of Kaktovik and the Iñupiat Community of the Arctic Slope (ICAS), are treated like states for certain federal tax purposes.²

**Iñupiat Community of the Arctic Slope.**

ICAS is the regional tribal government for all the North Slope villages. It was established in 1971 under the IRA and is one of only two regional sovereign Tribal governments in Alaska recognized by the United States government.

**North Slope Borough.**

Kaktovik is located within the NSB, the regional home-rule government comprised of 94,763 square miles of northern Alaska all above the

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Artic Circle, shown in Map 1. It retains all power not specifically restricted by its charter or by state law. The borough provides some services for Kaktovik residents, including planning and zoning, water and sewer service, trash pick-up, road maintenance. NSB also has taxing authority, generally levying a property tax of 18.5 mills, with authority for up to 20.0 mills.

NSB has an Assembly whose members are elected by residents of the North Slope Borough and serve their constituents during their elected term of office. The members enact laws, appropriate North Slope Borough School District and departmental funds, establish mill levies, acts as the Board of Equalization, confirm departmental directors, confirm appointments to all boards and commission, and certify NSB elections. There are eleven members: six members representing the Utqiaġvik community and the remaining five members represent seven villages across the North Slope. The Assembly person representing Kaktovik also represents Anaktuvuk Pass. Because the representative for Kaktovik and Anaktuvuk Pass currently lives in Anaktuvuk Pass, Kaktovik is the only North Slope community that does not have a resident serving on the Assembly.

NSB has a Planning Commission with eight members and eight alternates; one regular member and one alternate member are from each North Slope community. All commissioners are appointed by the NSB Mayor and confirmed by the NSB Assembly. The Planning Commissioners perform functions related to planning and zoning. They also serve as representatives of their respective communities and use their position to bring issues and concerns of their communities the attention of the North Slope Borough administration.

Kaktovik Iñupiat Corporation.

Kaktovik Iñupiat Corporation (KIC) is the village Native corporation for Kaktovik that was founded in 1973 after the passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971. KIC represents the interests of its Iñupiat shareholders from Kaktovik. KIC is headquartered in Kaktovik.

Arctic Slope Regional Corporation. ASRC, based in Utqiaġvik, is a private and for-profit regional Native corporation that represents the business interests of its approximately 13,000 Iñupiaq shareholders that primarily live in the eight North Slope communities, including Kaktovik. It was established through the ANCSA in 1972. ASRC is the largest Alaskan-owned company, employing nearly 12,000 people worldwide. The Corporation’s operations are strongly based in natural resources, holding title to approximately five million acres of land.

3.2. History of Kaktovik

The Iñupiat of the North Slope have a rich cultural history that is evident in both the living traditions and archaeological sites scattered across the landscape. Some of today’s North Slope villages have been occupied continuously for thousands of years while others were more recently founded as year-round village sites. Yet the Arctic Slope is filled with history and culture of those that have come before, evidenced by abundant archeological sites across the entirety of the borough’s frozen tundra. Archeological investigations indicate that the North Slope

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region has been inhabited for at least 11,000 years. Along the Beaufort Sea coast is Barter Island and the community of Kaktovik. The area is also called Qaaktuqvik; the Qaaktuqvik Iñupiat people are known as Qaaktuqvikmiut or Kaktovikmiut. While the community of Qaaktuqvik does not date back as far as the earliest North Slope settlements, a large village once existed on the island. In 1914, Diamond Jenness, an explorer for the Canadian government, documented counted 30 to 40 old house sites along the spit running east from Barter Island and a similar amount on Arey Island, a long slender island located approximately five miles to the west of Barter Island. Barter Island had been an important location for trade between Canadian Inuit and Iñupiat from the Utqiagvik region during the 1800s. It had likely been used for that purpose for centuries.

As commercial whaling stocks declined in the

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southern Pacific, whalers expanded northward to take advantage of the known resources in the Bering Sea. Commercial whaling in the Arctic grew rapidly from 1850, beginning with the discovery of bowhead migration routes and development of more efficient whaling techniques. The bowhead was originally sought for its oil, but the development of the petroleum industry in the 1860s reduced that demand.\(^{10}\)

During the 1890s and early 1900s, Barter Island became a commercial stopover for whalers. Nearby residents were also able to benefit from the increase in trading in the region. When commercial whaling ended in the Beaufort Sea around 1914, fur trapping took its place as the main source of cash income. The semi-nomadic Qaaktuviqmiut combined subsistence hunting with trapping and reindeer herding as they moved from place to place.\(^{11}\)

In 1917, whaler and trader Charles Brower sent his associate, Tom Gordon, from Utqiagvik to Demarcation Point, located about eight miles from the Canadian border, to establish a fur trading post. It would be one several to be built over the ensuing decade along the Beaufort Sea coast. Gordon relocated to Demarcation Point with his wife Agiak, their family, and some of her relatives from Utqiagvik, including Andrew Akootchook, Agiak’s brother. After spending a year at Demarcation Point, Akootchook and his family moved to Barter Island, a convenient and assessable location for hunting and fishing. In 1923, Akootchook helped Gordon establish a trading post at Barter Island.\(^{12}\)

As more families began to settle in the area, a community began to develop.\(^{13}\) Fur trapping was a large portion of the local economy, with furs serving as a form of currency with which to obtain store goods and supplies.\(^{14}\) Although a year-round settlement existed during the 1920s and 1930s, most of the inhabitants of the region continued to live a seminomadic lifestyle spread out along the coast, mainly gathering around the trading post during holidays and special events.\(^{15}\)

The regional economy changed drastically when, in 1936, the price of fur declined, signaling the end of the trapping era. This, combined with the decline and then end of reindeer herding in the late 1930s, led several families to move to Herschel Island, Canada.\(^{16}\) For those who remained, their first contact with the U.S. military occurred in the 1940s, when the Alaska Territorial Guard arrived in the community during World War II.\(^{17}\)

The U.S. military was investigating building and updating existing Alaska radar stations to protect against a northern attack by the Soviet Union.\(^{18}\) The population in and around Barter Island was largely nomadic until people from across Alaska moved to the area during the construction of a runway in 1947 and the Long Range Radar Station (LRRS) in 1952.

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16 Ibid.
The U.S. Air Force began building a runway and hangar for a Distant Early Warning (DEW) Line station on Barter Island’s eastern sandpit. The first phase of this installation involved construction of a 5,000-foot long airstrip and hangar on a prehistoric village site and in the same place where several Kaktovik residents had homes. Citing Public Land Order 715 (Reserving Public Lands for the Use of the Department of the Air Force for Military Purposes), the U.S. Air Force seized the village site for the airstrip. The village residents were told to move 1,650 yards west to a new village site on the north side of the island. While the people were in the process of moving their belongings, military contractors bulldozed over 50 traditional sod homes and driftwood structures southward into the lagoon. Many ice cellars had to be abandoned and new ones were dug at the relocated village site. The new village was located on a slowly eroding section of beach and in the landing pattern of the new landing strip. The village site was relocated again in 1953 because of changes in the DEW Line layout and new road construction. The village of Kaktovik was moved three times as construction on the airstrip and the DEW Line station progressed.19

The village adopted the official name of Kaktovik in 1964. A new village townsite plat was surveyed in 1964 and recorded in 1966. The current city limits include the 1964 townsite, portions of the 1974 addition of the Kaktovik Subdivision, and an area surrounding the Fresh Water Lake southwest of the townsite. Kaktovik incorporated as a fourth class city in March 1971 and was reclassified as a second class city in September 1971. In 1972, the U.S. Air Force relinquished a 360-foot wide strip of land along the western boundary of the original townsite for selection by the Kaktovik Iñupiat Corporation under terms of the Alaska Native Claims Settlement Act (ANCSA). The corporation, in turn, quitclaimed that land to the City of Kaktovik. The current village of Kaktovik lies on the north shore of Barter Island, between the Okpilak and Jago Rivers on the Beaufort Sea coast. The island is separated from the mainland in summer by a quarter mile wide shallow lagoon and connected by sea ice in the winter.

3.3. Iñupiaq Values and Language

In 1991, Kaktovik residents developed *In This Place*, a guide for those that work or plan to work in the Kaktovik region. The document was written in response to increasing interest in petroleum exploration within the Kaktovik people’s homeland, lnuuniagviat Kaktovikmuit. It outlines the Kaktovikmuit views, needs, and requirements about land development. A map that identifies lnuuniagviat Kaktovikmuit is included as Map 3.20

The residents of Kaktovik honor cultural ties to ancestors and the land through traditional Iñupiaq values. The Iñupiat highly regard family, work ethic, the Iñupiaq language, drumming and dancing, and sharing food and knowledge of animals with a deep respect for the environment as it provides fresh water, clean air, and subsistence foods. Table 1 summarizes values of the North Slope Iñupiat.

The NSB Iñupiat Heritage, Language, and Culture Department maintains the Traditional Land Use Inventory (TLUI), a complete historical record of the land, people, and villages of NSB. Development cannot disturb traditional subsistence activities or values at historic, archaeological, and cultural sites that are identified in published studies or by the IHLC Commission nor can development impact a historic resource prior to an assessment by a professional archeologist.21 The IHLC Department also focuses on preserving oral history through traditional land use studies, historical accounts, stories, legends, and life histories in all media formats and through the Heritage Center that educates visitors and provides a place for cultural revitalizing efforts and a gathering space. 22

The Iñupiaq language is an integral component of the cultural identity of the Iñupiat. North Slope residents and the borough places great importance on expanding fluency in Iñupiaq to preserve traditional culture and values.

Beginning in the early 1900s to the 1970s, Native Alaskan children were taken from rural communities that lacked either primary or secondary schools and sent to boarding schools run by the federal Bureau of Indian Affairs (BIA), by private churches or, later, by Alaska’s state government. There were both positive and negative aspects to this experience for the students. One well-documented negative was that many children were not allowed to speak their Native language and even received physical punishment when they did. Students’ feeling a loss of culture and identity were common; many found it difficult to return home and feel accepted because they had missed out on learning important traditional skills.23

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21 Planning and Zoning Commission Approvals, North Slope Borough Municipal Code § 19.60.040(K).
Table 1: Iñupiaq Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paaqalqautainiŋq Avoidance of Conflict</td>
<td>The Iñupiaq way is to think positive, act positive, speak positive and live positive.</td>
</tr>
<tr>
<td>Nagliktuutiaq̣ngiq Compassion</td>
<td>Though the environment is harsh and cold, our ancestors learned to live with warmth, kindness, caring and compassion.</td>
</tr>
<tr>
<td>Paamaaqiq̣gigiq̣ Cooperation</td>
<td>Together we have an awesome power to accomplish anything.</td>
</tr>
<tr>
<td>Ilagiigiq̣ Family and Kinship</td>
<td>As Iñupiat people, we believe in knowing who we are and how we are related to one another. Our families bind us together.</td>
</tr>
<tr>
<td>Qiịniiŋniiq Humility</td>
<td>Our hearts command that we act on goodness. We expect no reward in return. This is part of our cultural fiber.</td>
</tr>
<tr>
<td>Quvianq̣nuiqq Humor</td>
<td>Indeed, laughter is the best medicine.</td>
</tr>
<tr>
<td>Anjuniq̣laaniq Hunting Traditions</td>
<td>Reverence for the land, sea, and animals is the foundation of our hunting traditions.</td>
</tr>
<tr>
<td>Iñupiaq̣laaniq Knowledge of Our Language</td>
<td>With our language, we have an identity. It helps us to find out who we are in our mind and in our heart.</td>
</tr>
<tr>
<td>Piqpakkuq̣taq̣ngiq̣ Qiksikrautiaq̣ngiq̣ Utuqqanaanun Allanullu Love and Respect for our Elders and One Another</td>
<td>Our Elders model our traditions and ways of being. They are a light of hope to younger generations. May we treat each other as our Elders have taught us.</td>
</tr>
<tr>
<td>Qiksikrautiaq̣ngiq̣ Iñuuniaq̣vigmun Respect for Nature</td>
<td>Our Creator gave us the gift of our surroundings. Those before us placed ultimate importance on respecting this magnificent gift for their future generations.</td>
</tr>
<tr>
<td>Aviktuaq̣atigiíngiq̣ Sharing</td>
<td>It is amazing how sharing works. Your acts of giving always come back.</td>
</tr>
<tr>
<td>Ulpiaq̣uitiaq̣ngiq̣ Spirituality</td>
<td>We know the power of prayer. We are a spiritual people.</td>
</tr>
</tbody>
</table>

The 2019 North Slope Borough Economic Profile and Census Report (NSBEP&CR) indicates that Kaktovik, having a population that is 73 percent monolingual English, stands out as having the least traditional language retention of any North Slope community. 25 Point Lay has the lowest proportion of Iñupiaq speakers overall, but is joined by Atqasuk, Kaktovik, and Point Hope in a low tier of fluency, with 15% or less of Iñupiaq individuals speaking the Iñupiaq language. 26 Moreover, approximately 73 percent of

26 Ibid.
households in Kaktovik do not have a single Iñupiaq speaker in the home.

In 2019, Kaktovik had one of the lowest percentages of household heads that both speak and prefer speaking Iñupiaq, at 1.7 percent. A mere six percent of Kaktovik’s household heads speak fluent Iñupiaq, higher only than Point Lay. Approximately 58 percent of Kaktovik household heads Iñupiaq language skills range from understands simple questions and directions / speaks a little to does not understand more than a few Iñupiaq words.27

Over the last twenty years, there has been a decrease in both the number of Kaktovik residents that speak Iñupiaq as well as the number of Kaktovik households where Iñupiaq is the primary language. Fewer households are speaking Iñupiaq at home than they have in the past, which usually parallels the passing of elders. Households that primarily speak English have nearly doubled over the last two decades, from 42 percent in 1998 to 80 percent in 2019. Conversely, in 1998 seven percent of Kaktovik residents spoke Iñupiaq mostly, increasing to eight percent in 2003, to 11 percent in 2010. However, a dramatic decrease occurred between 2010 and 2015. Only three percent of Kaktovik households reported speaking mostly Iñupiaq at home when surveyed in 2015. In 2019, there were not any households in Kaktovik that spoke mostly Iñupiaq.28

Because of the dramatic decline in fluent Native Iñupiat language speakers, the NSBSD has made efforts to strengthen the Iñupiaq language by offering language classes utilizing the Accelerated Second Language Acquisition Method and supported with a customized computer based language-learning tool.29 To assist adults in learning or re-learning Iñupiaq, the IHLC Department sponsored the production of an online Iñupiaq language program in partnership with the Rosetta Stone program for Endangered Languages.

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28 Ibid.
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Chapter 4

People of Kaktovik

The Kaktoviğmiut of Barter Island are a tight-knit community of primarily Alaska Native people that have lived in this region for thousands of years. This section provides historical population information as well as information on age, race, Iñupiaq language fluency, and population growth.

4.1. Historical Population

Barter Island has a long and rich history as both a settlement and trading place. However, it was not until 1950 that the U.S. included Kaktovik in its decennial census as an unincorporated village, when the federal government determined that approximately 46 people resided in the community. In 1960, the community reappeared on the decennial census as Barter Island with 120 residents. In the 1970 U.S. Census, the community of Kaktovik was reported as having 123 residents. Kaktovik was formally incorporated as a second-class city in 1971.

The community experienced sustained growth over the ensuing three decades, 1970 through 2000. Between 1973 and 1993, the community grew 60 percent;30 between 1993 and 2010, Kaktovik grew by another 34 percent.31 The first sign of population decline was in the 2003 NSBEP&CR, which recorded a slight population decrease from the 2000 U.S. Decennial Census taken three years earlier. However, the trend seemed to continue. While the NSBEP&CR indicated an increase in the 2010 population, the U.S. Census recorded a decline of 54 residents over the preceding decade. A population decline continued into 2015 and 2019.32, 33 Kaktovik is now the smallest community on the North Slope, with an estimated 246 residents.34

Table 2 provides a historical perspective of Kaktovik’s population beginning in 1950. Complementing Table 2 is Figure 2, a graphic depiction of the population changes between 1950 and 2019 using both the U.S. Decennial Census population and the NSB Census. Figure 3 illustrates state, borough, and local population changes over a 40-year period.

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34 Ibid.
Table 2: Historical Population and Population Trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>46</td>
<td>U.S. Census</td>
</tr>
<tr>
<td>1960</td>
<td>120</td>
<td>U.S. Census</td>
</tr>
<tr>
<td>1970</td>
<td>123</td>
<td>U.S. Census</td>
</tr>
<tr>
<td>1980</td>
<td>165</td>
<td>U.S. Census</td>
</tr>
<tr>
<td>1990</td>
<td>224</td>
<td>U.S. Census</td>
</tr>
<tr>
<td>2000</td>
<td>293</td>
<td>U.S. Census</td>
</tr>
<tr>
<td>2003</td>
<td>286</td>
<td>NSB Census</td>
</tr>
<tr>
<td>2010</td>
<td>239</td>
<td>U.S. Census</td>
</tr>
<tr>
<td></td>
<td>308</td>
<td>NSB Census</td>
</tr>
<tr>
<td></td>
<td>239</td>
<td>DCCED Certified Population</td>
</tr>
<tr>
<td>2015</td>
<td>155</td>
<td>ACS 5 Year Estimate</td>
</tr>
<tr>
<td></td>
<td>262</td>
<td>DCCED Certified Population</td>
</tr>
<tr>
<td></td>
<td>262</td>
<td>NSB Census</td>
</tr>
<tr>
<td>2019</td>
<td>254</td>
<td>U.S. Population &amp; Housing Estimates</td>
</tr>
<tr>
<td></td>
<td>246</td>
<td>NSB Census</td>
</tr>
</tbody>
</table>

Figure 2: Population Growth, 1950 – 2019

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Table 3 provides details on specific population characteristics of Kaktovik and the changes that have taken place between 1998 and 2019 based on the NSBEP&CRs.

Table 3: Resident Characteristics, 1998 - 2019

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>256</td>
<td>286</td>
<td>239</td>
<td>262</td>
<td>246</td>
</tr>
<tr>
<td>Female</td>
<td>49.2%</td>
<td>49.5%</td>
<td>46.6%</td>
<td>50.8%</td>
<td>44.6%</td>
</tr>
<tr>
<td>Male</td>
<td>50.8%</td>
<td>50.5%</td>
<td>53.4%</td>
<td>49.2%</td>
<td>55.4%</td>
</tr>
<tr>
<td>Median age</td>
<td>30</td>
<td>28</td>
<td>33</td>
<td>23.4</td>
<td>28</td>
</tr>
<tr>
<td>Median age of females</td>
<td>30.5</td>
<td>28</td>
<td>29</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Median age of males</td>
<td>30</td>
<td>29</td>
<td>34</td>
<td>23</td>
<td>29.5</td>
</tr>
<tr>
<td>Iñupiat</td>
<td>85.1%</td>
<td>88.2%</td>
<td>85.9%</td>
<td>90.9%</td>
<td>88.0%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>6.2%</td>
<td>7.7%</td>
<td>12.8%</td>
<td>6.6%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Other</td>
<td>2.0%</td>
<td>4.1%</td>
<td>1.3%</td>
<td>2.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Fluent Iñupiat speakers</td>
<td>39.5%</td>
<td>17.1%</td>
<td>18.5%</td>
<td>14.8%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Size of the labor force</td>
<td>141</td>
<td>98</td>
<td>140</td>
<td>211</td>
<td>94</td>
</tr>
<tr>
<td>Average household size</td>
<td>3.08</td>
<td>3.32</td>
<td>3.44</td>
<td>3.94</td>
<td>3.29</td>
</tr>
<tr>
<td>Per capita Iñupiat income</td>
<td>$14,014</td>
<td>$17,889</td>
<td>$12,356</td>
<td>$8,953</td>
<td>$17,432</td>
</tr>
<tr>
<td>Average Iñupiat household income</td>
<td>$46,800</td>
<td>$59,342</td>
<td>$46,861</td>
<td>$34,507</td>
<td>$65,995</td>
</tr>
</tbody>
</table>

There has been little change in the racial make-up of Kaktovik over the last decade. Eighty-eight percent of the population is Iñupiat, differing only slightly from 2015 when nearly 91 percent of residents identified as being Iñupiat, and 2010 when the Iñupiat population was 86 percent. In 2019, the non-Iñupiat population was nine percent Caucasian and three percent Other.\(^{40}\)

While the racial composition of the community has not changed significantly, the number of fluent Iñupiat speakers has declined significantly. Table 3 includes the percent of speakers over five NSB census years. The rate of fluent Iñupiat speakers in Kaktovik has declined from nearly 40 percent in 1998 to just over five percent in 2019.\(^{41}\)

In 2010, Kaktovik had a relatively young population with 27.4 percent of its residents 16 years of age and under, compared to 23.4 percent for Alaska as a whole.\(^{42}\) The young population in Kaktovik has increased to 33.3 percent of the total population in 2019. Similarly, the median age in Kaktovik in 2010 was 33, dropping to 28 in 2019.\(^{43}\)

Kaktovik’s proportion of both young and elder populations to the entire community are shown as a dependency ratio. A dependency ratio is a calculation of the proportion of the population not in the workforce who are dependent on those of working-age. Dependency ratios are useful for estimating and preparing for social, economic, health, and educational needs and services. Those aged under 16 and over 65 years


\(^{41}\) Ibid.


are classified as dependents and those aged 16 to 64 years of age are classified as the working-age population. As shown in Table 4, the dependency ratio in 2019 was over 60 percent of the population.

Table 4: Age Distribution and Dependency Ratios, 2003 – 2019

<table>
<thead>
<tr>
<th>Age Range</th>
<th>2003</th>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 years and under</td>
<td>36.1%</td>
<td>27.4%</td>
<td>36.3%</td>
<td>33.3%</td>
</tr>
<tr>
<td>18 years and under</td>
<td>41.0%</td>
<td>31.6%</td>
<td>40.4%</td>
<td>35.9%</td>
</tr>
<tr>
<td>55 – 64 years of age</td>
<td>9.8%</td>
<td>10.7%</td>
<td>9.1%</td>
<td>13.7%</td>
</tr>
<tr>
<td>65 and older</td>
<td>7.7%</td>
<td>9.8%</td>
<td>4.4%</td>
<td>5.2%</td>
</tr>
<tr>
<td>18 – 64 years of age</td>
<td>53.6%</td>
<td>59.8%</td>
<td>57.0%</td>
<td>59.5%</td>
</tr>
<tr>
<td>16 – 64 years of age</td>
<td>56.3%</td>
<td>62.8%</td>
<td>59.3%</td>
<td>61.4%</td>
</tr>
<tr>
<td>Youth Dependency Ratio</td>
<td>64.1%</td>
<td>43.5%</td>
<td>61.1%</td>
<td>54.3%</td>
</tr>
<tr>
<td>Age Dependency Ratio</td>
<td>13.6%</td>
<td>15.6%</td>
<td>7.4%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Total Dependency Ratio</td>
<td>77.7%</td>
<td>59.2%</td>
<td>68.6%</td>
<td>62.8%</td>
</tr>
</tbody>
</table>

4.2. Population Growth

The strongest component of population growth is natural increase, with more births occurring than deaths. Between 1998 and 2018, 113 residents were born and 43 persons passed away,\textsuperscript{44} for a net increase of 70 people. As illustrated in Figure 6, births have been variable over the twenty-year period, ranging from a low of 0 in 1999 to a high of 11 in 2008 and 2018; deaths have ranged from a low of zero for five years to a high of eight in 2016. Births have exceeded deaths in most years; the exceptions are 1999, 2003, 2006, and 2016.

Figure 6: Births and Deaths, 1998 – 2018

The U.S. and NSB censuses do not collect data on new residents or current residents moving out of the village, also known as resident in-migration and out-migration. Out-migration is often attributed to high school graduates leaving to attend college, workers seeking employment opportunities elsewhere, or residents leaving to be close to other family members or loved ones. In-migration would most often be attributed to new residents moving to the village to live with or near family members or for employment.

One potential indicator of the prevalence of in- and out-migration in Kaktovik may be the number of people who apply for the annual Alaska Permanent Fund Dividend (PFD). The Permanent Fund program tracks the dividend recipients by zip code and community. Figure 7 illustrates the combined number of adult and child applicants for the PFD program living in Kaktovik between 2000 and 2018. The total number of applicants has remained relatively steady over the nineteen-year period. Over this period, the highest combined total of PFD applicants was in 2013 at 258; the year with the least applications submitted by both child and adult residents was in 2008, at 233. There were nearly as many as thirty fewer applications for children in 2011 than there was in the early part of the preceding decade. The total annual applicants over the last few years have been lower than any of the previous years, although in some cases, only by a few applicants. Nevertheless, the number of applicants each year does illustrate an overall decline since 2013.

The State of Alaska uses PFD applications in conjunction with birth and death data and the U.S. Census to determine the population of a community. The number of PFD applications does not always provide an accurate portrayal of a community’s population, leading to an undercount of the existing population and thus to an estimate that is not reflective of the actual population in the community. Some of the issues with using the PDF as an indicator of in- and out-migration can be problematic. There are number of reasons an Alaska resident would choose not to apply for PFD dividend, including avoiding jury duty or other obligations, the dividend would be garnished for unpaid taxes or child support, or because a resident appreciates other benefits of being an Alaska and does not want more. In two of the three years that both NSB Census data and PDF applicant counts are both available, the number of PFD applicants was less than the population, with a difference of 36 and 22 people in 2003 and 2015 respectively.

Determining population estimates for small communities in rural Alaska is problematic, even though both the U.S. Census Bureau and the State of Alaska make a determination annually. According to the 2015 NSBEP&CR, the problem with the rural Alaska population estimates is, in part, that the U.S Decennial Census is an estimate based on a combination of surveys and administrative reports. The U.S. Census Bureau reported that for the 2010 Decennial Census “approximately 74 percent of the households returned their census forms by mail; the remaining households were counted by census workers walking neighborhoods throughout the United States.” While U.S. Census takers do conduct door-to-door counts, rural Alaskan villages are difficult to reach, accommodations are often non-existent, weather conditions make walking throughout the community difficult, and some houses are determined vacant when they are not, questioning the effectiveness of this method in these communities. All of these factors can reduce accurate village population counts.

The State of Alaska uses a combination of trend lines based on the prior U.S. Decennial Census as well as PFD applications, birth and death rates, and migration to complete population estimates.

### 4.3. Population Growth Projections

Calculations of the size of future populations are useful for land use planning; economic

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49 The 2015 PFD Annual Report provided only the total number of applicants.
using the years 1990 and 2010 provide a similar 2040 projected population of about 267 residents.

The no-growth rate shown in Table 5 assumes that the population decline continues of one-half percent per year, with a projected population in 2040 of 221 people. The modest growth scenario of one-half percent per year assumes a stable job market in government services and temporary or permanent construction, often related to NSB capital infrastructure projects, with a projected population in 2040 of 273 people. This is the growth rate that is used for calculating public facility capacities in Chapter 7. The high one percent annual growth rate scenario assumes that there is some moderate growth in government services, perhaps coupled with other industry development nearby that may provide jobs for residents in Kaktovik, with a projected population in 2040 of 303 people. Even with potential oil and gas industry exploration and development in the 1002 Area of ANWR, it is unlikely that the community would grow at a greater rate than one percent per year over the next twenty years. If Kaktovik residents had the opportunity to work in a burgeoning oil industry nearby, it would not be until after exploration and substantial investment in permitting and construction. Lastly, the linear trend projections presented in Table 5 are more closely aligned with a one percent annual growth rate or a continued but substantial decline. Population projections are also shown graphically in Figure 8.

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54 Chapter 10: Land Use & Zoning provides includes a discussion of the 1002 Area of ANWR.
Table 5: Twenty Year Population Projections

<table>
<thead>
<tr>
<th>Rate of Growth</th>
<th>2019 Base Year</th>
<th>2025 Projection</th>
<th>2030 Projection</th>
<th>2035 Projection</th>
<th>2040 Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percent Projection</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Growth (+1%)</td>
<td>246</td>
<td>261</td>
<td>274</td>
<td>288</td>
<td>303</td>
</tr>
<tr>
<td>Modest Growth (+0.5%)</td>
<td>253</td>
<td>260</td>
<td>266</td>
<td>273</td>
<td></td>
</tr>
<tr>
<td>No Growth (−0.5%)</td>
<td>239</td>
<td>233</td>
<td>227</td>
<td>221</td>
<td></td>
</tr>
<tr>
<td><strong>Linear Trend Projection</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990 and 2010 U.S. Decennial Censuses</td>
<td>N/A</td>
<td>247</td>
<td>250</td>
<td>258</td>
<td>262</td>
</tr>
<tr>
<td>2003 and 2019 NSB Censuses</td>
<td>N/A</td>
<td>231</td>
<td>219</td>
<td>206</td>
<td>194</td>
</tr>
</tbody>
</table>

Figure 8: Twenty Year Population Projections
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5.1. Physical Setting

Kaktovik is the furthest east of the North Slope Borough’s eight communities, located along the coast of the Beaufort Sea approximately 110 miles east of the Prudhoe Bay oil field and the industrial center of Deadhorse and 70 miles west of the U.S. and Canadian Border (Map 1). The region encompasses the country that drains northward from the mountainous Brooks Range to the expansive Arctic Ocean.55

Kaktovik is located on Barter Island, a coastal island inside the protection of gravel barrier islands that dot along Alaska’s northern coast. Barter Island is approximately six square miles or 3,800 acres, containing flat rolling wetlands and thaw ponds typical of the Arctic Coastal Plain.

Soils of the Arctic Coastal Plain are ice-rich silty permafrost, topped by a thin peaty tundra mat supporting a variety of tundra vegetation. Barter Island is comprised of mixtures and layers of marine and alluvial clay, silt, sand, and gravel. The top layer sits on continuous permafrost, which extends several hundred feet below ground surface.56

Gravel spits extend from the northeast and northwest corners of Barter Island. The Island tapers to the south gradually at first, then into a finger of land separated from the mainland by a saltwater channel less than one-quarter mile wide. Once across this narrow channel, Kaktovik residents are within the Arctic National Wildlife Refuge.


Fresh water on Barter Island includes a large freshwater lake, many thaw ponds, and a few seasonal channels which drain to Kaktovik Lagoon. The Freshwater Lake is approximately one-half mile west of the community and provides potable water to Kaktovik. The potable water system is detailed in Chapter 7: Public Facilities.

Every facet of the Kaktovik and broader Arctic environment that humans have named, lived alongside, relied on, monitored, and discussed is undergoing severe change at this moment in history. In general, the climate in Kaktovik is Arctic, with long cold winters, short cool summers, low precipitation, and persistent strong winds. However, Kaktovik residents have witnessed the impact of climate change to typical weather patterns, local vegetation, coastline, and soils, and the pace of change has only accelerated. The following section attempts to describe the changing environment as residents are experiencing it.

5.2. The Changing Environment

Dramatic impacts of climate change are experienced in Kaktovik. Many of these changes are irreversible on a human timescale, such as coastal erosion or permafrost melt leading to land subsidence. All residents have undoubtedly been impacted by the changing environment, perhaps by failing ice cellars, changing bowhead whale migration, native plant retreat, tundra fires, coastal permafrost melt, or land subsidence; the list is extensive. In a traditional Iñupiat community where 97 percent of residents rely on subsistence foods, the effects of climate change impact daily life as well as long-term family, lifestyle, and career decisions.

Many of the environmental changes in Kaktovik and across Arctic latitudes are interrelated. For example, a warming climate may allow woody brush to move northward and outcompete native tundra plants. Woody plants have deeper roots than grasses, remove more water from the soil, and burn hotter and for longer when on fire. A tundra fire melts permafrost and the ground erodes and subsides, perhaps increasing surface water or simply resulting in unstable ground. Either could cause the burned area to be avoided by migrating caribou, to the detriment of subsistence hunters who rely on the caribou to sustain their families. This process reinforces itself: as the newly open ground is fertile for non-native and invasive species, which continue to dry and warm the soil, releasing carbon from permafrost stores into the atmosphere.

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57 According to the National Aeronautics and Space Administration (https://climate.nasa.gov/resources/global-warming-vs-climate-change), climate change is a long-term change in the average weather patterns that have come to define Earth’s local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term.


atmosphere\textsuperscript{62} to trap heat and contribute to a warming planet.\textsuperscript{63}

Environmental issues are difficult to present singularly, such as increase in tundra wild fires, without discussing the underlying change in plant communities, increased temperatures, and precipitation, which made the fire hazard possible. For this reason, this section is in not in order of importance. It does begin at a regional scale, describing the land and sea, then transitions to more a local discussion to include hunting and subsistence activities, the coastline, and impacts to infrastructure and the built environment in the village of Kaktovik.

5.3. Climate

The weather in Kaktovik is warmer and wetter than it has been in the past. A recent analysis of the last 100 years shows the annual temperature has risen 7.3°F (degrees Fahrenheit) in the neighboring community of Nuiqsut.\textsuperscript{64} On average, northern Alaska has seen an increase of 5.8°F.\textsuperscript{65}

Precipitation has been increasing in Kaktovik and across the State of Alaska. Increased precipitation is a natural result of higher temperatures, as a warmer atmosphere holds more water than vapor. Between 1969 and 2018, precipitation on the North Slope has increased by 9.5 percent from baseline data. This water comes from runoff or drainage and snowmelt. The Kuparuk River is about 100 miles west of Kaktovik, non-glacial fed, and water levels have monitored since the 1970s. From 2013 to 2017, the Kuparuk River experienced unprecedented high annual flow, indicating high (relative to the prior 40 years) snow and rain in the region.\textsuperscript{66}

Increased rain, snow, and temperatures have begun to change the Arctic landscape. The National Park Service (NPS) records air and soil temperature data within Alaska’s arctic national parks. From 2011 to 2015, NPS saw air and soil temperatures increase between 37° and 39°F.\textsuperscript{67}

\begin{flushright}
Photo courtesy of UMIAQ Environmental
\end{flushright}
with wide-ranging impacts for Arctic residents and wildlife. Warming temperatures put permafrost soils at risk, fragile in their composition of ice, silt, and sand. Permafrost has warmed between 5.4 and 7.2°F over the past three decades. The impact of warming permafrost is seen in both natural slopes and in communities. The sections on coastal erosion (5.9) and subsidence (5.10) detail the results of melting permafrost to Kaktovik’s coastline and within the community.

Melting permafrost increases the amount of surface water across the tundra. Some 600 more lakes linked to thawing permafrost have appeared on the North Slope since 1955. The additional surface water accelerates thaw of underlying permafrost soils and adds moisture to the air, an additional factor contributing to increased precipitation. The impact of this surface water is magnified by the vast amounts of open water due to melting sea ice. This issue is further discussed in Section 5.7.

5.4. Air Quality

Air quality in Kaktovik meets the Alaska ambient air quality standards (AAAQS). The most recent air quality advisory for the North Slope was in summer 2017, when multiple wild fires were burning in the Yukon Flats, located between Fairbanks and Kaktovik. While no advisories exist currently, the National Research Council (NRC) found in 2003 that no large-scale long-term monitoring system has been established to provide a quantitative baseline of air quality trends on the North Slope. This is still true today, however, there are additional monitoring locations, as well as additional pollution sources. Residents have reported increased particulate matter or dust, arctic haze, locally produced smog, and decreased visibility. Lack of a pre-development air quality baseline hampers an assessment of North Slope air quality and the potential impact of proposed oil and gas developments.

Particulate matter becoming airborne is a near-constant occurrence during summer months in Kaktovik, when the average annual wind speed is 13 to 17 miles per hour and soils are permafrost topped by sands, gravels, and a thin peaty tundra mat. Development within Kaktovik and the surrounding areas, paired with hotter summers, has amplified the dust issue. Residents have experienced more localized dust or particulate matter in recent years. Dust can cause or irritate a variety of respiratory, skin, and other health issues. Particulates can be inhaled and lodged deep in the lungs, or enter the bloodstream. Road watering and/or road binders is essential in Kaktovik, especially as the gravel road footprint grows.

5.5. The Land

The Arctic landscape is important to the health of the globe as this frozen soil is one of the...
largest long-term stores of carbon on land. Within permafrost there is frozen organic matter that will decompose once thawed and release carbon into the atmosphere as carbon dioxide or methane, potent gasses which trap heat in the atmosphere. This is a concern for any human resident of the globe, however climate change is a local problem in Kaktovik with vast impacts to daily life.

The Kaktovikmuit do not live just within the city of Kaktovik, but rather “on a much grander scale, which is necessary to our whole system of values and essential to our survival as a Native people.” The comparison has been made that the physical limits of the city do not comprise the home, rather the home is the entire country where travel and subsistence hunting take place with the city being just one room in that home.

5.6. Plant Communities and Tundra Fires

Tundra plant communities have been changing at pace with the climate, which is quickly. The Arctic has warmed nearly twice as fast as the rest of the planet over the past half century. Satellite data from over the last 35 years tracks a flourishing green Arctic; however, studies northern Alaska studies show that many low-lying tundra plants and grasses have been replaced by spruce or alder shrubs, a process known as ‘browning’ of the previously green landscape. Warming air temperatures are expected to continue to increase shrub dominance on the North Slope. An increase in shrub cover can raise soil temperatures and contribute to permafrost thaw, which leads to further climate change.

Tundra fires are increasingly becoming an issue in the Alaska Arctic. In Alaska and Canada’s Northwest Territories, the number of lightning-sparked fires has risen 2 to 5 percent per year over the last four decades. The severity of tundra fires are in part determined by plant composition and soil moisture content, with fires in tussock tundra communities typically less severe than those in shrublands. Tundra plants have shallow roots, which protect underlying soil by keeping it moist. In the coastal plain of ANWR, a 25-year review of plant cover found extreme vegetation changes at plots which had very high soil ice content or surficial ice wedges where thaw caused soil subsidence and surface wetting. Kaktovik residents can see this occurring right in town. The good news for Kaktovik, however, is that little vegetation change has occurred in undisturbed areas like

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ANWR.\textsuperscript{84} Road and pad development in ANWR could lead to vegetation changes and potentially browning of this region.

5.7. The Sea

Kaktovik is a base from which to go into the sea and onto the land. It is not a new base. It has been used for various purposes by various people since time immemorial, even before those times of which the legends speak. Kaktovik, perched at the edge of both land and sea, is also witnessing changes to the Beaufort Sea and formation of sea ice. In late 2019, ice cover of the Beaufort and Chukchi Seas hit a record low of 270,000 square miles, half of what it averaged between 1981 and 2010.\textsuperscript{85} Loss of the protective cover of sea ice has a huge impact on the coastline, newly susceptible to wave and wind action year-round. More on this is provided in Section 5.9: Coastal Erosion. Additional surface water offshore aids an increase in precipitation, which has doubled in the past three years compared to the previous decade.\textsuperscript{86} Open water has brought increased vessel traffic to Arctic communities, including Kaktovik. Residents have reported foreign vessels transiting close to shore and garbage washing up on shore. Subsistence whaling has been impacted by both the increase in marine traffic and the debris left behind.\textsuperscript{87} The U.S. Coast Guard (USCG) has an operations location in Utqiagvik, a significant distance when the ocean is frozen for much of the year. As Arctic oil exploration and shipping routes become more heavily frequented vessel traffic is expected to increase.

One impact of climate change that is harder to see and recognize is ocean acidification. The Beaufort Sea and the Arctic Ocean, like all the world’s oceans, is becoming more acidic. One known result of the ocean becoming more acidic is that shelled organisms such as oysters, clams, urchins, and corals have a much harder time making and maintaining their shells. Larger fish and mammals rely on these organisms for their diet, so impacts to the entire food web are expected.\textsuperscript{88}

5.8. Wildlife

The Kaktovik region provides habitat for an abundance of creatures. Many are migratory, traveling great distances to summer in the far north to breed, nest, forage, and rear young. In winter months, marine mammals such as polar bears and seals are the primary megafauna and migratory birds retreat to sea or wintering grounds.

\textsuperscript{84} Jorgenson, Janet, Martha K. Reynolds, Joel H. Reynolds, and Anna-Marie Benson. 2015. Twenty-Five Year Record of Changes in Plant Cover on Tundra of Northeastern Alaska: Arctic, Antarctic, and Alpine Research, 47-4, 785-806. DOI: 10.1657/AAAAR0014-097. \url{www.researchgate.net/publication/283553614_Twenty_Five_Year_Record_of_Changes_in_Plant_Cover_on_Tundra_of_Northeastern_Alaska}

\textsuperscript{85} National Snow and Ice Data Center. 2019. Yearly Archives: 2019. Low, but Steady Growth. \url{http://nsidc.org/arcticeaicenews/2019}


\textsuperscript{87} Kaktovik Community Strengths, Weaknesses, Opportunities, Threats Workshop held on January 22, 2020.

\textsuperscript{88} National Park Service. 2019. Ocean Acidification. \url{www.nps.gov/subjects/aknatureandscience/oceanacidification.htm}
Below is a list of terrestrial and marine mammals, birds, and fish of the Kaktovik region. This list includes common species as well as important or well-known species, which may not be as common.

### Table 6: Mammals, Birds, and Fish

<table>
<thead>
<tr>
<th>Mammals, Birds, and Fish of the Kaktovik Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Terrestrial Mammals</strong></td>
</tr>
<tr>
<td>Alaska Marmot, Arctic Ground Squirrel, Beaver, Black Bear, Brown Bear, Caribou, Dall Sheep, Arctic Fox, Red Fox, Brown Lemming, Collard Lemming, Lynx, Moose, Muskox, Muskrat, Porcupine, River Otter, Snowshoe Hare, Barren Ground Shrew, Tundra Shrew, Northern Red-backed Vole, Northern or Tundra Vole, Least Weasel, Short-tailed Weasel or Ermine, Wolf, Wolverine</td>
</tr>
<tr>
<td><strong>Marine Mammals</strong></td>
</tr>
<tr>
<td>Bearded Seal, Beluga Whale, Bowhead Whale, Harbor Porpoise, Polar Bear, Ribbon Seal, Ringed Seal, Spotted Seal, Walrus</td>
</tr>
<tr>
<td><strong>Waterfowl</strong></td>
</tr>
<tr>
<td>Tundra Swan, Greater White-fronted Goose, Lesser Snow Goose, Canada Goose, Black Brant, Mallard, Green-winged Teal, American Wigeon, Northern Pintail, Northern Shoveler, Greater Scaup, Lesser Scaup, Common Eider, Kind Eider, Spectacled Eider, Surf Scoter, Long-tailed Duck, Red-breasted Merganser</td>
</tr>
<tr>
<td><strong>Seabirds</strong></td>
</tr>
<tr>
<td><strong>Shorebirds</strong></td>
</tr>
<tr>
<td><strong>Songbirds</strong></td>
</tr>
<tr>
<td>Common Raven, Arctic Warbler, Varied Thrush, American Robin, Northern Wheatear, Bluethroat, Northern Shrike, Yellow Wingtail, Yellow-rumped Warbler, Yellow’s Warbler, Wilson’s Warbler, Savannah Sparrow, American Tree Sparrow, Dark-eyed Junco, White-crowned Sparrow, Smith’s Longspur, Lapland Longspur, Snow Bunting, Rusty Blackbird, Common Redpoll, Hoary Redpoll</td>
</tr>
<tr>
<td><strong>Avian, Upland Birds and Raptors</strong></td>
</tr>
<tr>
<td>Upland birds: Sandhill Crane, Rock Ptarmigan, Willow Ptarmigan Raptors: Golden Eagle, Northern Harrier, Rough-legged Hawk, Merlin, Peregrine Falcon, Gyrfalcon, Short-eared Owl, Snowy Owl</td>
</tr>
<tr>
<td><strong>Whitefish</strong></td>
</tr>
<tr>
<td>Arctic Cisco, Bering Cisco, Broad Whitefish, Humpback Whitefish, Least Cisco, Round Whitefish, Sheefish or Iconnu</td>
</tr>
<tr>
<td><strong>Char</strong></td>
</tr>
<tr>
<td>Arctic Char, Dolly Varden Char, Lake Trout</td>
</tr>
<tr>
<td><strong>Pacific Salmon</strong></td>
</tr>
<tr>
<td>Chinook Salmon, Chum Salmon, Pink Salmon, Red Salmon</td>
</tr>
<tr>
<td><strong>Other Freshwater Fish</strong></td>
</tr>
<tr>
<td>Alaska Blackfish, Arctic Grayling, Arctic Lamprey, Burbot, Longnose Sucker, Ninespine Stickleback, Northern Pike, Threespine Stickleback, Slimy Sculpin</td>
</tr>
<tr>
<td><strong>Nearshore Marine/Brackish Water Fishes</strong></td>
</tr>
<tr>
<td>Arctic Cod, Saffron Cod, Capelin, Arctic Flounder, Starry Flounder, Fourhorn Sculpin, Pacific Herring, Rainbow Smelt</td>
</tr>
</tbody>
</table>

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Kaktovik is known for its wildlife viewing and sees a spike in tourism in the fall as visitors flock to the community for polar bear viewing. The Beaufort Sea coastline is the only place in the U.S. to view polar bears. Between August and November, polar bears are seen close to the community where they can feed on the whalebone pile located outside of town at the end of the old gravel runway.

Polar bear viewing guidelines and a polar bear patrol have been established to safeguard the community and communicate bear activity. This is especially important as Arctic tourism has increased in recent years. Visitors understand that the Arctic landscape is threatened and are hoping to catch a glimpse of the frozen north while they still can. More on tourism can be found in Section 8.3.

Residents of Kaktovik have been reporting changes in seasonal timing and wildlife migrations for years. As the climate warms, more creatures can flourish in Arctic habitats. Insect eggs, such as those of the native autumnal moth, usually die around -22°F, but warmer winters have allowed more eggs to survive. It is likely the case that many insects can survive at higher rates in warming Arctic temperatures, creating an abundance of food for birds and other creatures that eat insects, but also potentially reducing plant biomass which insects feed on. Changes to the primary consumers of a food web will assuredly have an impact on the secondary consumers and onwards to the largest predators, however it is unknown if wildlife changes cited by residents are due to fluctuating temperature, landscape stability, food sources, or other factors.

One study analyzed movement data from over 1,000 individual caribou from seven major herds, spanning over 1,800 miles across Alaska, Yukon, Northwest Territories, and Nunavut Canada, from 1995 to 2017. They found departure to be queued by ocean-driven climate indicators and the speed of migration to be very changeable depending on maternal body condition and

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therefore conditions that limit insect harassment. Earlier spring migration timing caused earlier calving and higher survival rates.\textsuperscript{91} Kaktovik residents are taking note as migratory animals adapt to dynamic and unpredictable environments. More on subsistence hunting, harvesting, and gathering, and how these activities may be impacted by climate change is included in the Chapter 6: Subsistence.

### 5.9. Threatened Species

The Endangered Species Act (ESA) (1973) provides a program for the conservation of threatened and endangered plants and animals and the habitats on which they attend. The lead federal agencies for implementing ESA are the U.S. Fish and Wildlife Service (USFWS) and the U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. The FWS maintains a worldwide list of endangered species. The law requires federal agencies, in consultation with the USFWS and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife. Likewise, import, export, interstate, and foreign commerce of listed species are all generally prohibited.

Spectacled Eider (Somateria fischeri), Steller's Eider (Polysticta stelleri), and Polar Bear (Ursus maritimus) are listed as threatened species by the ESA and are known to be found in the

Kaktovik area. Final critical habitat rulings have been made for the Spectacled and Steller’s eider and the Polar Bear. The Spectacled and Steller’s eider critical habitat is all of the Chukchi and Bering Sea, although they are found in the Kaktovik area as well. The Polar Bear critical habitat is found on much of the shoreline and barrier islands around Barter Island although the community of Kaktovik is not included in the critical habitat designation.

5.10. Coastal Accretion and Erosion

Accretion is the gradual increase or acquisition of land by the action of natural forces washing up sand, soil or silt from the seashore. The opposite of accretion, erosion is the gradual washing away of land along the shoreline.

The Beaufort Sea coastline experiences constant accretion and erosion. While there are several areas which consistently experience accretion, namely within Arey Lagoon, the coastline’s change is predominantly erosional over the long term. The average annual rates of change have been erosional with greater rates along exposed barrier islands and spits.92

Erosion of the coastal bluff in Kaktovik is one of the most remarkable visual aspects of climate change in the community. Erosion affects the entire coastline of Barter Island; however, it is most pronounced on Arey Island, the northern Beaufort Sea coastline, in Kaktovik Lagoon bays, and along the eastern edge of the finger of land which extends south to the mainland (see Map 2). In the most eroded areas, over 1,000 feet of shoreline has been lost since 1947.93

Erosion has been documented by the U.S Geological Survey (USGS), including through videos of the eroding coastline taken in summer 2014 and summer 2019.94, 95 The videos provide a time-lapse view of the bluff thawing and slipping back into the water and impart the rapid pace with which this is occurring.

The erosion of the coastline is caused by air and soil temperatures warming to melt permafrost and also by wave action from the Beaufort Sea. During large storms, waves strike the coast, produce coastal flooding, and can drive large pieces of sea ice inland.96 The coastline has been protected by the cover of sea ice reducing wave action and simply crumbles when pummeled by storm surges.

The Kaktovik townsite is near Pipsuk Bight (of the Kaktovik Lagoon) with the primary eroding slope being the northern extent of Barter Island. At minimum, the coastline is a quarter mile from residential development. The Federal Aviation Administration (FAA) and other federal agencies have recently removed infrastructure closest to the northern coastline including the airport hangar and several buildings northwest of town near the Long Range Radar Station, formerly a DEW Line site.

The Kaktovik Inupiat Corporation owns a number of barrier islands as well as land on Barter Island, along the coastline, and inland (see Map 10), selected through the Alaska Native Claims Settlement Act (ANCSA) (see Chapter 10). The

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dynamic nature of the Beaufort Sea’s barrier islands leaves KIC with fewer acres than the corporation was allotted. KIC has considered working with the Bureau of Indian Affairs (BIA) to adjust their selections.97

While the coastal bluff provides an exposed slope which heat and wave action can penetrate, permafrost melting is occurring in tundra landscapes exposed or not. What occurs inland is known as land subsidence.

Coastal Erosion
Map 2

Data Source:
U.S. Geological Survey, Coastal and Marine Geology Program

Note:
Erosion rates are expressed in meters per year

Shoreline Recorded 1947
Shoreline Recorded 2003
5.11. Subsidence & Infrastructure

Warming temperatures melt ice inside of permafrost soils and soils above the permafrost sink in to the space provided when water drains. Subsidence can wreak havoc on infrastructure with piles in permafrost or on gravel pads with poor thermal integrity. Buildings can shift unevenly and utility corridors can be severed or blocked. Communities in the North Slope Borough have experienced significant subsidence of several feet in some areas. Kaktovik has not experienced settlement of this magnitude, but residents have observed that the school site and various buildings around town appear to be sinking.98

The NSB has experienced subsidence in the Kaktovik utility corridor. In 2016, the water mains required regrading because they were sinking, and a refrigerated pad was installed to maintain thermal stability. The same repair is currently planned for the vacuum lift station. Several service features to homes have shifted or settled99. The waste heat piping, installed in 2005, has settled up to four inches where it crosses Hula Hula Avenue and will be repaired in 2020.100

Subsidence is the clearest type of damage to infrastructure caused by the warming climate and resulting permafrost melt. Other concerns to infrastructure caused by climate change may be the shrinking of fresh water lake, suggested by residents but not yet measured, erosion at the coast accelerating to impact inland structures, and water drainage systems which cannot keep flow regulated. Culverts and drainage pipes are often bent during road grading or maintenance, and water is unable to drain properly. Bent or broken culverts are not caused by climate change, however functioning culverts are required to keep up with increased annual precipitation. Pooling water can erode slopes, cause health and safety issues, and threaten buildings above.

5.12. Ice Cellars

Ice cellars, dug deep into the permafrost, have historically provided a form of natural refrigeration to Arctic residents. Ice cellars store bowhead whale meat as well as caribou, fish, and other subsistence foods. Kaktovik residents have reported all ice cellars in the community have been lost and have not been used for many years. Ice cellars are unusable when they fill with water, which occurs when the walls of the cell melt and erode or water finds its way in to the space from underground. There does not seem to be scientific consensus for the cause of ice cellar failure in the Arctic.101, 102 A decade-long thermal monitoring study of ice cellars in Utqiagvik revealed that little thermal change over that period. The study, however, also noted that although climate change has considerable potential for affecting ice cellars, sediment chemistry, local hydrology, and urbanization are also important impacting factors.103

Ice cellars, when available, provide no-cost refrigeration for subsistence foods. The loss of ice cellars in Kaktovik is an economic hardship, requiring purchase and constant power generation for a freezer or several freezers to fit large animals such as caribou or whale. The loss of ice cellars is also a cultural tragedy. Inupiat families have been utilizing ice cellars as a part of their cultural heritage for thousands of years and they are a part of the subsistence harvest and spiritual process.
Chapter 6

Subsistence

“Kaktovik is a base, a base from which to go into the sea and onto the land. It is not a new base. It has been used for various purposes by various people since long before anyone can remember…it is a base; not a municipality in the sense that southern people think of cities, as their home, their entire home. It is more like a room in a home, a small room in a very big home.”

“We understand this country far better than other people can, what it can stand and what it cannot stand. Our nerves reach out into it.”

In This Place
A Guide for Those Who Would Work in the Country of The Kaktovikmiut
An Unfinished and On-going work Of the People of Kaktovik, Alaska (1991)

Wild resources, animals, fish, and plants, are harvested, processed, shared, and consumed in an economy and way of life called subsistence. Subsistence is a way of life in Kaktovik. There are a number of definitions of subsistence and many different understandings of its meaning. What is clear is that the term means different things to people based on their cultural upbringing.

The North Slope Borough Municipal Code defines subsistence as

“The activity performed in support of the basic beliefs and nutritional needs of the residents of the Borough and includes hunting, whaling, fishing, trapping, camping, food gathering, and other traditional and cultural activities.”

(NSBMC 19.20.020)

The State of Alaska defines subsistence uses as

“...the noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption, and for the customary trade, barter, or sharing for personal or family consumption; in this paragraph, "family" means persons related by blood, marriage, or adoption, and a person living in the household on a permanent basis.”

(AS 16.05.940(33))
Subsistence uses in Section 803 of the federal law Alaska National Interest Lands Conservation Act (ANILCA) is defined as

“...the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption; and for the customary trade, barter or sharing for personal or family consumption.”

ANILCA, the act passed in 1980 that designated more than 100 million acres of federal land in Alaska as new or expanded conservation system units, includes a subsistence priority by applying three criteria:

1. customary and direct dependence upon the populations as the mainstay of livelihood
2. local residency; and
3. availability of alternative resources (Section 804).

ANILCA also requires that an evaluation be completed for impacts of land use on subsistence (Section 810) and that reasonable access be provided for subsistence on public lands (Section 811).

While the term subsistence implies the use of natural resources for physical needs, it may not always convey the spiritual, cultural, and community importance of harvest activities. For Alaska Natives of the North Slope, subsistence is both a connection to the land and to Inupiat ancestors who have passed down traditional knowledge through the generations. It is not only a way of life, but also the joy of living from the gifts that the Creator provides.

6.1. Village Area of Influence

The Kaktovik Area of Influence is a planning boundary around the community that identifies the commonly used areas for subsistence activities. The primary purpose of identifying this contemporary use area is to protect subsistence activities that are important to local residents. One method to do that is to regulate development activities; permit applicants are often required to consult with the appropriate local entities and conduct community outreach prior to final approvals.

Subsistence foods are gathered from both the land and sea surrounding Kaktovik. The Area of Influence changes over time, partly because many subsistence species are migratory. Bowhead whales and caribou alike may migrate thousands of miles, arriving in the Kaktovik Area of Influence at specific times in the season and/or their life cycle. Migratory birds may spend only a few weeks of their year within the Area of Influence, using routes that change over time. The community’s subsistence areas and patterns are determined not only by the
seasonality of resources but also by the village’s geographical position and periodic access limitations. Kaktovik’s area of influence overlaps the areas of influence of neighboring villages of Nuiqsut and Anaktuvuk Pass, fitting within the traditional Iñupiat cultural values of sharing and subsistence.

The Kaktovik Area of Influence extends approximately 120 miles west of Kaktovik, just beyond Deadhorse and the Dalton Highway transportation corridor, to just over 150 miles east of the community, about 40 miles beyond Hershel Island, Canada. It extends over 80 miles south of the community, well into the Brooks Range, and about 50 miles north of Kaktovik into the Beaufort Sea. All together, the Area of Influence covers nearly 35,000 square miles. It overlaps with the areas of influence of other North Slope communities. It is not intended to be inclusive of all activities, but rather describes there area within which key subsistence resources for Kaktovik are harvested and family traditional uses occur. The Kaktovik Area of Influence is shown in Map 4.

In This Place: A Guide for Those Who Would Work in the Country of the Kaktovikmiut, an Unfinished and Ongoing Work of the People of Kaktovik, Alaska maps the traditional homeland of the Kaktovik Iñupiat, Iñuuniagviat Qaaqtuviqmiut, noting that Kaktovik serves as a base from which residents go into the sea and onto the land. The homeland boundaries are complex and that The continental divide to the south, respecting the lands of the Gwich’in Tribe; the seemingly endless bounds of the Arctic Ocean to the north, in many ways the heartland of the Iñupiat. Eastern and western bounds are more complex and not precisely defined, respecting the lands used frequently by other Iñupiat in both Alaska and Canada as well as the needs of the Kaktovik people. "There is no empty country, no place without Iñupiat equity and presence, not north of the divide, not south of at least 100 kilometers to sea. There is nothing open for grabs, and there never was, not since our ancestors came here thousands of years ago, and not for all the years yet to come." 104

Map 3: In This Place Homeland of the Kaktovik Iñupiat

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6.2. Subsistence Harvest

Residents rely on a variety of seasonally abundant resources of terrestrial and marine mammals, fish, and waterfowl for some or all of their diet. Subsistence is important for the people of Kaktovik for both food and cultural sustenance. It is a common and traditional practice for residents to share their subsistence resources with others within and outside the community. The sharing of subsistence resources with family members, elders, those who cannot hunt or fish, and other community members is a key Iñupiaq value and a source of pride and identity by people who give and receive those gifts. Kaktovik residents are dependent on subsistence resources at all income levels. Expensive store-bought food makes the subsistence activities and sharing harvests even more important.

Hunting, fishing and gathering of food and plants are essential subsistence activities, especially among Iñupiaq households where the subsistence way of life remains an important source of food. Kaktovik’s primary subsistence resources are caribou, sheep, bowhead whale, fish, and waterfowl. Seal, polar bear and furbearers are also important. Subsistence resources and seasons are summarized below.105, 106, 107

6.3. Marine Mammals

**Ağiq (Bowhead Whale)**

Whaling is an important part of the village culture, and preparation for whaling occurs throughout the year. Oral traditions recall whaling in the last century when commercial whalers also used the area. Kaktovik whaling occurs in the fall from 15 to 30 miles from shore, primarily between Camden Bay and Tapkaurak Lagoon. Increased risks of meat spoilage and safety can occur when travelling further. Whaling begins in July, and the vast majority of harvests occur in September.

The aği quota for Kaktovik is three strikes per year, established by the International Whaling Commission (IWC) and managed locally by the Alaska Eskimo Whaling Commission (AEWC). In 2018, IEWC approved automatic renewal of aği quotas for Alaska Native subsistence hunters for the first time.108
**Ugruk (Bearded Seal)**

Ugruks are the most common seal harvested by Kaktovik residents. Hunting occurs between Prudhoe Bay and Demarcation Bay, usually not more than 30 miles from shore. Hunting occurs between March and September with the majority of effort during July and August.

**Natchiq (Ringed Seal)**

Hunting for natchiq occurs simultaneously with hunting of ugruk in the same areas. Almost all hunting is done during day trips. Hunting occurs between March and September with the majority of harvests occurring between July and September.

**Aiviq (Walrus)**

Since aiviq are not commonly seen near Kaktovik, harvests are rare. Harvests occur primarily north of Barter Island from June to October.

**Nanuq (Polar Bear)**

Nanuq are common in the Kaktovik area but are not harvested in high numbers. They are especially prevalent during the fall months, leading many tourists to travel to Kaktovik for polar bear viewing. The Marine Mammal Protection Act of 1972 allows coastal-dwelling Alaska Natives to harvest polar bears for subsistence purposes, including making and selling handicrafts. Both the voluntary Inuvialuit-Iñupiat Polar Bear Management Agreement and the U.S.–Russia Polar Bear Bilateral Agreement recognize the importance of conserving female polar bears with their cubs and therefore prohibit their harvest.¹⁰⁹

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**6.4. Land Mammals**

**Tuttuvak (Moose)**

Subsistence tuttuvak hunting occurs occasionally in the areas around the Sadlerochit, Hulahula and Okpilak rivers. It occurs only during the winter and spring.

**Imnaiq (Dall Sheep)**

Kaktovik has good winter access to Imnaiq in the Brooks Range.

Kaktovik residents also hunt other terrestrial animals, such as the siksrik (Arctic ground squirrel), aklá (brown bear), tiqiqinniaq (white Arctic fox), qanqáaq (cross fox), kayuqtuq (red fox), and qunjiiq (reindeer).

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6.5. Birds

**Amauligruaq and Qijalik (Common Eider and King Eider)**

Kaktovik residents hunt amauligruaq and qijalik opportunistically, but these birds are not as important as geese. Hunting generally occurs in the same areas during the same period as geese hunting (April to October with the majority of hunting effort during May and June).

Residents also commonly hunt aaqhaaliq (long-tailed duck) and aqargiq (willow ptarmigan).

**Iqsraqutilik, Niqiiŋnaq, Kaŋuŋ, and Niqlivialuk/Niqliq (Canada Goose, Black Brant Goose, Lesser Snow Goose, and white-fronted goose/speckled belly)**

Hunting for geese is a popular activity for Kaktovik residents. Coastal use areas range from Prudhoe Bay to the Mackenzie Delta, and residents also travel to inland rivers. Hunting occurs between April and October with the majority of harvests in May, June and September. Snow machines provide access to harvest areas in the spring and boats during the summer and fall.

6.6. Fish

**Tittaaliq (Burbot)**

Although not an important subsistence species for Kaktovik, some harvests occur for tittaaliq while fishing for other species. Fish are caught between Mikkelsen Bay and the Aichilik River. Harvests occur between June and October.

**Qaaktaq (Arctic Cisco)**

Fishing for qaaktaq occurs during the summer migration of the fish along the coast from the Mackenzie River to the Colville River. Over half of the trips last over two weeks. Fishing occurs June – September with the majority of use occurring July and August. Boats provide the greatest access to fishing areas, but areas are also accessed by 4-wheelers, foot, and cars or trucks.

**Iqalukpik/Paiqľuk and Iqalukpik (Arctic Char and Dolly Varden)**

Harvests of these fish are common and often coincide with qaaktaq fishing, although paiqľuk and iqalukpik are harvested in inland areas as well as along the coast. The majority of harvests occur during July and August, although they are harvested all year long, including during the winter through the ice. More than half of subsistence fishing involves use of boats with 25 percent use of snow machines to access fishing areas.

**Aanaaktiq (Broad Whitefish)**

Although not as important as qaaktaq or iqalukpik, Kaktovik residents occasionally harvest aanaaktiq along the coast between Mikkelsen Bay and Shingle Point. While mostly a coastal activity, some inland ice fishing occurs. Most harvests occur during July and August, although some fishing occurs during all other months except May.

Kaktovik residents also fish for Iqalusaaq (Least Cisco), Silver Salmon, and Sulukpaugaq (Arctic Grayling).
6.7. Plant Resources

Harvested plants include asiaq (blueberry), ippiq (pink plumes), aqpiq (salmonberry), quaqaq (sour dock), qunulliq (wild rhubarb, mountain sorrel), kavlat (bear or blackberry), pauŋat (crowberry), kimmigñaq (low-bush cranberry), uğruq (sphagnum moss), uqpiit (willow), argiaŋnaq (puffball), sargiŋruaŋ (stinkweed or wormwood), and nauriat (plants and flowers). Both if and to what extent any of these plant resources are harvested varies. There are likely other subsistence plants that are not included here. All plants were collected during the warmer months, from June through September when the ground is snow-free.110

6.8. Subsistence Seasons

Kaktovik subsistence patterns are determined by the seasonality of the resources as well as residents’ ability to travel by boat during open water seasons or by snow machine in winter. Table 7 details major subsistence harvests by month in Kaktovik.111, 112

Table 7: 2010 Major Subsistence Resource Hunting Season Harvests113

<table>
<thead>
<tr>
<th>Resource</th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nov</td>
<td>Dec</td>
<td>Jan</td>
<td>Feb</td>
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<td>Agviq</td>
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<tr>
<td>Beawhead Whale</td>
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<tr>
<td>Ugruk, Natchiq</td>
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<td>L</td>
<td>L</td>
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<tr>
<td>Bearded Seal, Ringed Seal</td>
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<tr>
<td>Tuttu</td>
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<td>L</td>
<td>L</td>
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<tr>
<td>Caribou</td>
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<tr>
<td>Tuttuvak</td>
<td>M</td>
<td>M</td>
<td>M</td>
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<tr>
<td>Moose</td>
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<tr>
<td>Amaguq, Qavvik</td>
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<td>H</td>
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<td>Canada Goose, Black Brant Goose, Lesser</td>
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<td>M</td>
<td>H</td>
<td>H</td>
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<td>Aqargiŋq</td>
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<td>Willow ptarmigan</td>
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<td>Qaaqtåq, Salmon</td>
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<td>Arctic cisco</td>
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<tr>
<td>Iqbalukpick, Piaqtluk</td>
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<tr>
<td>Arctic char, Dolly Varden</td>
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<td>Burbot</td>
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<tr>
<td>L = Low harvest activity</td>
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<td>H = High harvest activity</td>
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</table>

112 As compiled in the 2015 Kaktovik Comprehensive Development Plan.

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Winter Subsistence Activities.\textsuperscript{114} Sheep and caribou hunting decline in December due to lack of daylight. Trapping continues from the fall and wolves and wolverines are taken in the mountains. Foxes are trapped along the coast. By late January hunters begin to return to the ANWR and to the Brooks Range foothills and mountains. Trips become more frequent in March with increasing daylight. Winter fishing at the Hulahula River fish camps is best from late February to April. Some caribou remain on the coast and are taken in late winter. Some sheep hunting may be done in late winter. Lake trout are taken at places in the mountains, and ling cod can be obtained along inland portions of rivers.

Spring Subsistence Activities.\textsuperscript{115} The long daylight hours of April and May and sufficient snow cover are good conditions for snow machine travel and hunting expeditions to the mainland, particularly in ANWR. Fishing at ice holes in the Hulahula and other rivers continues until early April. Sheep might be taken in May. Furbearer hunting continues until May as well. Ground squirrels and marmots are hunted from early April when they come out of their holes. Ptarmigan, though hunted all year, are most easily taken when they congregate in large flocks in the spring. The first migratory waterfowl are taken along the coast in late spring and early summer, especially at traditional sites like Nuvuaq where seals, fox and fish can be taken in various seasons. Caribou are not taken during the late spring/early summer calving period.

Summer Subsistence Activities.\textsuperscript{116} Waterfowl arrive as soon as there is open water. Tent camps are set up in the Camden Bay area. As the season progresses and snow cover disappears, residents hunt closer to the village on the mainland and around Arey Island. Eggs are gathered on several of the barrier islands. Seals are taken and walrus may be taken when encountered on a seal hunt. Griffin Point is a primary subsistence area where caribou, seals and fish are taken. During June, subsistence activities decrease because the snow cover disappears on the mainland prohibiting snow machine travel and the sea and rivers waters remain frozen prohibiting boat travel.

In early July, when the waters open up, residents travel by boat in the shallow waters along the coast and river delta regions and set nets in Kaktovik Lagoon and other sites from Camden Bay to Jago Spit for Arctic char. Cisco and pink salmon are caught in nets later in the summer, and occasionally beluga whales are taken. Broad whitefish are caught along the island beaches. Caribou season opens in July and they are taken along the coast. A particularly good caribou hunting area is at Konganevik Point.

Fall Subsistence Activities.\textsuperscript{117, 118} Whaling begins in late August. Crews may travel 50 – 60 miles out to sea at the beginning of the season, but later, when the whales migrate closer to shore, they can be harvested nearer to the village. Whaling may continue for several weeks. After whaling and freeze-up, inland travel is again possible and snow machine trips are made along the Hulahula River and into the


\textsuperscript{116} Ibid.

\textsuperscript{117} Ibid.

mountains. Various camps along the river provide a base for access to good ice fishing for grayling and Dolly Varden/Arctic char and hunting for caribou and sheep in late October-early November. Kongakut River fishing sites are used for Dolly Varden/Arctic char fishing. Grayling fishing is done in nearly all the major rivers and especially along the Canning and Kuparuk Rivers where whitefish and ling cod are also taken.

Data from recent years has shown changes to subsistence resources of all varieties and in all seasons. Back as recently as 2010, Kaktovik Iñupiat households reported that their subsistence activities including sealing, hunting land mammals, fishing, and gathering had increased over the previous five years. In 2015 and 2019 conversely, decreases were seen across all activity categories, including whaling and gathering. The decrease in gathering activity suggests there are reasons outside of cost that control ability to take part in subsistence activities. There is no special equipment required to gather edible or medicinal herbs, berries, and other plants. These items are often growing in town and do not require transit to the mainland, yet there is a marked decrease in gathering activities reported by residents from 2014 to 2019.

Table 8: Changes in Subsistence Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td>Whaling</td>
<td>9%</td>
<td>11%</td>
<td>13%</td>
</tr>
<tr>
<td>Sealing/Walrus</td>
<td>33%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Hunting Land Mammals</td>
<td>33%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Fishing</td>
<td>28%</td>
<td>6%</td>
<td>17%</td>
</tr>
<tr>
<td>Gathering</td>
<td>30%</td>
<td>9%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Over time changes to subsistence harvests is expected as there are multiple resource categories and it is common to supplement a poor year of one resource with another more abundant resource, such as harvesting more fish or seals in a poor caribou year. However, the main concern is that in general subsistence activities have been decreasing across the North Slope and within Kaktovik. Expensive store-bought food is the only alternative. Store-bought foods that are shelf stable and for sale in Kaktovik are often poor in nutritional value when compared to the subsistence foods they are replacing. Bowhead whale, for example, is high in omega fatty acids, protein, vitamins A, D,
and E, and essential minerals. A reduction in subsistence activities means residents may be paying more for foods that are substantially less healthy than subsistence foods.

In 2018, 64 percent of Kaktovik household heads who reported they could not get enough healthy meals attributed this to not getting enough subsistence foods. All of the factors that inhibit or promote use of subsistence foods and taking part in subsistence activities such as warming climate, tundra fires, increased surface water, permafrost melt and land subsidence, ocean acidification, and federal lands and species management have impacts to the livelihood and health of residents of Kaktovik.

### 6.9. Subsistence Sharing

According to the North Slope Borough Economic Profile and Census Report, in 2018, 97 percent of households in Kaktovik reported using subsistence foods. The proportion of Iñupiat households that use subsistence foods has not varied over time; Kaktovik subsistence participation has been around 100 percent since polling began 20 years ago and undoubtedly for much longer. All residents benefit from a high subsistence use rate. Nearly 90 percent of subsistence users in Kaktovik reported giving away some of their harvest in 2018. The biggest recipients of shared foods include elders, households without hunters, and households without sufficient income to purchase store bought foods.

While almost all residents of Kaktovik use subsistence foods consistently over time, what has changed is the amount of subsistence foods used and the percentage of diet made up by subsistence foods. In 2018, over 40 percent of Iñupiat households received less than half of their diet from subsistence foods, as shown in Table 9. This means nearly half of the households relied on expensive store bought foods and subsistence foods equally. This is alarming due to high cost of packaged foods and relatively poor nutrition when compared to subsistence foods. Reliance on store bought foods has been steadily increasing for at least 20 years.

### Table 9: Households Receiving Less than Half of Diet from Subsistence

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>2003</th>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Iñupiat households</td>
<td>17%</td>
<td>32%</td>
<td>25%</td>
<td>31%</td>
<td>43%</td>
</tr>
</tbody>
</table>

---


122 Ibid.


6.10. Land Ownership

Federal ownership and game management practices within the Arctic Refuge surrounding Kaktovik is commonly cited by residents as an impediment to subsistence hunting and harvesting.\(^{125}\) While traditional Iñupiat subsistence harvest activities have been practiced for thousands of years, the Arctic Refuge was established in 1960 by President Dwight Eisenhower.

Hunting within the Arctic Refuge is regulated by the U.S. Department of the Interior (USDOI), specifically the U.S. Fish and Wildlife Service. The DOI publishes Federal Subsistence Management Regulations for the Harvest of Wildlife on Federal Public Lands in Alaska\(^{126}\) (subsistence harvest regulations). These are harvest rules specifically for subsistence users that regulate seasons, harvest limits, methods, and customary and traditional use determinations for the subsistence taking of wildlife. Rural Alaskans such as Kaktovik residents are qualified to hunt, trap, or fish under federal subsistence regulations.\(^{127}\) Hunting permits, harvest tickets, or tags may be required from the state and/or the USFWS, depending on location and species. Some hunters from Kaktovik have experienced these regulations as restricting access and limiting seasons and harvest numbers. Residents have reported that hunting on privately owned native allotments across the mainland from Barter Island requires federal hunting permit.

The subsistence harvest regulations are created and implemented with assistance from the USDOI’s Federal Subsistence Management Program, which aims to provide Alaskans living in rural areas the opportunity for a subsistence way of life on federal public lands.\(^{128}\) The Subsistence Management Program is subdivided into regional advisory councils. The North Slope Regional Advisory Council represents eight rural communities, including Kaktovik. Currently there is one council member from Kaktovik on the North Slope Regional Advisory Council and three vacancies.\(^{129}\)

USFWS is not the only USDOI bureau that has management authority in the Arctic Refuge. The Bureau of Land Management (BLM) administers the oil and gas program within the Arctic Refuge’s 1002 Area, which contains the coastal plain of the Arctic Refuge. The BLM released a final Environmental Impact Statement (EIS) in September 2019 for their Coastal Plain Oil and Gas Leasing Program. BLM received comments from the community on the draft EIS at a February 2019 meeting in Kaktovik. The final EIS laid out several alternatives for a lease sale and scenarios for excluding locations or limiting development based on habitat, such as rivers and streams, nearshore marine, lagoon, and barrier island habitat, porcupine caribou herd calving habitat, and coastal areas. The BLM EIS process is still in process and no decision has been made regarding the possibility or extent of an oil and gas lease sale in the Arctic Refuge 1002 Area. However, any oil and gas lease sale in this region will undoubtedly have some impact on subsistence hunting, harvesting, and gathering. According to the 2019 NSBEP&CR, subsistence use in Kaktovik is already in a period of extreme change.

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\(^{125}\) Kaktovik Community Strengths, Weaknesses, Opportunities, Threats Workshop held on January 22, 2020.
Residents of Kaktovik have reported a steady increase in the number of hunting trips required each year than in previous NSB census years. Additional subsistence trips may be attributed to a number of environmental or economic conditions, but presumably more trips were required from 2015 to 2019 to secure the same amount of resources obtained from fewer trips taken from 2010 to 2015.

Subsistence users in Kaktovik report not only an increase in the number of trips, but also an increase in the distance travelled for subsistence activities, as detailed in Table 11. In general, the more subsistence foods eaten the further one has travelled to obtain them. Residents are reporting deviations in seasonal timing and/or migratory patterns of subsistence species. Traditional subsistence use areas are changing. In fact, over 40 percent of census participants in Kaktovik reported that some hunting and fishing areas used traditionally, including in 2015, were not used in 2019.

Table 10: Number of Subsistence Trips, 2010 - 2019

<table>
<thead>
<tr>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td>21%</td>
<td>23%</td>
<td>33%</td>
</tr>
</tbody>
</table>

Table 11: Distance Traveled for Subsistence Activities, 2010 -2019

<table>
<thead>
<tr>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td>21%</td>
<td>8%</td>
<td>24%</td>
</tr>
</tbody>
</table>

More hunting trips increase the cost of fuel, food, and ammunition, and require more time off from work or away from household or other responsibilities. Hunting can become increasingly expensive as residents are required to travel more often and father distances than...
before to feed their families. While a full time, permanent job may be helpful to afford fuel and ammunition, it also may diminish available time to participate in subsistence activities and reduce the amount of subsistence foods obtained overall. Development or reduced access within traditional hunting areas will continue to exacerbate this issue.

6.11. Climate Change

A changing climate may be a broad reason why the trend is towards more store-bought foods. Warming air and soil, melting permafrost, tundra fires, erosion and subsidence, and devastating coastal storm surges are all linked back to the Earth’s changing climate (for additional information, see Chapter 5: Natural Environment). Poor ice conditions impact marine mammal populations and the ability to hunt them. Wild fire, high water or overflow (aufeis) in rivers, or quagmire mud conditions may affect terrestrial access by snow machine or 4-wheeler.

Disease of subsistence resource species, access to food such as lichen for caribou, and predation are huge determiners of animal and therefore human health, and a warming climate can easily create uninhabitable conditions. For example, during a very warm spell in July of 2019, the Yukon Inter-Tribal Fish Commission found a massive die-off of sockeye, chum, and pink salmon in the Koyukuk River in western Alaska. Similar pink salmon die-offs were reported in multiple rivers in the Norton Sound135. The cause of these events is thought to be a heat wave as they otherwise appear to be healthy fish ready to spawn. Warm water holds less dissolved oxygen than cold water, so physiologically the salmon cannot get enough oxygen moving through their systems, and died with healthy eggs in their bellies136. This tragic event not only prevented subsistence use of the salmon, but also prevented spawning and fertilization of the salmon eggs which could mean a future reduction in salmon returning to these rivers.

Chapter 7

Public Facilities

Public facilities provide the backbone to life in any community. The transportation network, water and sewer system, community gathering space, and power system all are part of how a community functions. In the Alaska Arctic, planning, constructing, and maintaining public facilities and infrastructure is essential to ensuring that all residents and visitors are safe, comfortable, and able to gather as a community. Like many communities in rural Alaska and the North Slope, Kaktovik has aging infrastructure and high maintenance costs but also a valuable resource in this network of facilities that powers the community. This chapter examines public facilities in Kaktovik, focusing on both existing conditions and future needs. Map 13 provides a graphic overview of facilities in Kaktovik.

7.1. Recreation and Community Use Facilities

Recreational facilities are limited in Kaktovik. A fire on February 7, 2020 destroyed much of the Kaveolook School, including its new indoor track and gymnasium that also served as a space for community events and gatherings. The school playground did not sustain damage in the fire and is available for use. The City of Kaktovik has a city hall for larger community gatherings. Kaktovik does not have a childcare facility but residents have expressed the desire for one. A facility would need to be staffed with residents that are trained and certified as childcare professionals.

7.2. Telecommunications

A local communication tower was recently upgraded in the Kaktovik area, which the local police and fire departments use for radio communication. Internet and telephone services are often unreliable with intermittent and slow service.

Kaktovik, like most of rural Alaska, lacks access to broadband service. Arctic Slope Telephone Association Cooperative is the only telecommunications provider in Kaktovik. The types of services currently offered in the Kaktovik area include internet (satellite), local telephone service and custom calling features, long distance telephone service, wireless service, and ethernet transport services. Satellite bandwidth is prohibitively expensive, has limited capacity, and high latency. ASTAC is actively seeking funding to provide reliable connectivity and upgraded wireless service to Kaktovik as an extension of the Deadhorse network.
7.3. Public Safety

The NSB is responsible for providing public safety and emergency response across the seven borough villages with services including police, fire, and search and rescue. Each of these departments are headquartered in Utqiagvik. The borough maintains emergency management offices in the villages as well.

**Police.**

The North Slope Borough Police Department dispatches one full-time police officer to Kaktovik on rotating two-week shifts. The department also employs one local resident to serve as a Community Public Safety Specialist. The Kaktovik Police Station is a 2,780 square foot facility that was constructed in 1979 and upgraded in 2000.\(^{140}\) The facility includes a two-cell jail, evidence room, office area, garage, and living quarters for the police officer dispatched to the community.

Emergency 911 calls are typically placed directly to the local office during normal operating hours. Since the office is not staffed 24 hours a day, resident 911 calls are forwarded to the Utqiagvik dispatch during off hours. NSB dispatch will direct the call to local responders.

**Fire.**

The North Slope Borough Fire Department employs a staff of four in Kaktovik: one village fire chief, two emergency responders, and temporary hire position for when staff is out. The village facility is approximately 4,752 square feet and constructed in 2005.\(^{141}\) Volunteers and paid staff have basic fire training, cardiopulmonary resuscitation training (CPR), and other certifications. The Fire Department equipment includes a tanker, an engine truck, an ambulance, a pick-up truck, and a sport utility vehicle.\(^{142}\)

**Search and Rescue.**

NSB Search and Rescue provides medevac, search and rescue, and other emergency services boroughwide. The department’s main office is located in Utqiagvik with coordinators in the villages. The department currently has four aircraft (two winged aircraft and two helicopters) which are capable of both day and night flights, as well as visual and instrument meteorological flights.\(^{143}\) The helicopters are a Bell 420 and a Sikorsky S92 and the fixed wing planes are a King Air 300 and a Pilatus PC-24. Pilots are cross-trained in helicopter and winged aircraft flying. Search and rescue needs in Kaktovik are conveyed through the village search and rescue coordinator; personnel and equipment are subsequently dispatched from Utqiagvik.\(^{144}\)

Search and rescue efforts are planned in coordination with the Kaktovik volunteer Search and Rescue. Kaktovik’s Volunteer Search and Rescue shares a facility with the NSB Fire Department. They are working closely with the City of Kaktovik for land to build a permanent facility dedicated to search and rescue coordination and equipment storage. The Kaktovik Volunteer Search and Rescue has one boat and two snowmachines. If equipment is down, volunteers may use their own equipment in an emergency.\(^{145}\)


\(^{141}\) Ibid.


\(^{143}\) Ibid.

\(^{144}\) Ibid.

7.4. Water and Wastewater

The main water source on Barter Island is Fresh Water Lake. The Fresh Water Lake is approximately nine feet deep and freezes to about six feet during the winter. Water is pumped in the summer months into a water treatment plant (WTP) and then into two warmed storage tanks for winter use. The storage tanks hold 3.4 million gallons and 1.5 million gallons, for a combined total of 4.9 million gallons. From these tanks, potable water is distributed to homes through a buried pipeline, shown in Map 5.

Typical demand for water in a village of this size is between 28 and 30 gallons per person, per day. Up to 46 gallons per person per day can be utilized during peak flow periods. For planning purposes, water use per person, per day is estimated at 35 gallons. Freshwater storage capacity in Kaktovik is adequate and tanks are working and maintained properly.\(^\text{146}\)

With just one large fresh water source on Barter Island, contamination is always a concern. There are no known contaminated sites immediately adjacent to the Fresh Water Lake. The new airport runway is approximately 1,700 feet from the lake at its closest point and is not expected to contaminate the lake. The DEW Line site is located approximately 2,000 feet north of the Fresh Water Lake and has had known contaminants. While the Alaska Department of Environmental Conservation (ADEC) indicates that the contaminants have been cleaned up and institutional controls are in place, some residents have concerns that the community drinking water source could become contaminated. Locations and further discussions of known contaminated sites can be found in Chapter 10.

There is concern that the fresh water source is shrinking and becoming shallower due to sediment build-up and increased evaporation. The North Slope has been experiencing melting permafrost and a warmer climate. In many arctic environments, freshwater lakes and ponds have been getting smaller or disappearing entirely because they are draining into groundwater.\(^\text{147}\) Baseline data available on depth and extent of the Lake over time would be invaluable in addressing this concern.

Wastewater is collected through a buried pipe system and brought to the wastewater treatment plant (WWTP) for treatment. Sewer pipes have been installed to all homes in the townsite, with the exception of the newly constructed KIC shareholder subdivision south of Ninth Street.

Sewage disposal per person is estimated at 31.5 gallons a day. The Kaktovik WWTP can treat a maximum of 100 gallons of water per minute. Water treatment is slowed when cleaning or other maintenance processes are required. The NSB is currently scheduling maintenance at the WWTP to improve Alaska Department of Environmental Conservation regulatory compliance.

The sewage outfall to Kaktovik Lagoon is not functioning properly and causing ice to build up under the pipe near the support pilings, which has warped the joist. The NSB has kicked off a project to repair the outfall pipe and supports.\(^\text{148}\)

Sewer hookups can freeze and require maintenance to reestablish flow. Frozen pipes is one reason Kaktovik residents may use honey buckets instead of the piped sewer system. TNHA has recently constructed five homes in the KIC shareholders subdivision that utilize independent utility systems. At these homes, wastewater is discharged onto the tundra from the wastewater system in accordance with state regulations. However, wastewater cannot percolate into the soil because of the permafrost, causing ponding on neighboring properties and environmental issues like odor, erosion, and permafrost degradation. Due to these environmental concerns, operational requirements for these systems should be developed and incorporated into the borough’s code of ordinances with requirements for meeting village operational and discharge standards. Systems that do not meet these standards should be prohibited.

### 7.5. Snow Management

Strong winds in Barter Island create drifting snow. Snow fences have been installed west of town to reduce snow drifts and strong wind. However, they can pool water which can be harmful effects to the surrounding tundra. The effects of snow fences in Kaktovik, like in many other North Slope communities, are visible from aerial imagery as snowmelt accumulates, creating long slender lakes.

Snow removal and grading in Kaktovik flattens roadways, often damaging culverts and the drainage which has been engineered to reduce standing water. Standing water can warm underlying soils and speed permafrost melt, leading to subsidence or instability. Is it recommended that road maintenance and snow removal be performed with care to ensure water can flow through existing culverts.

### 7.6. Landfill and Solid Waste

Kaktovik has a relatively new landfill, which was permitted to accept waste as of August 2015. The former landfill operated for over 20 years. The former landfill was capped as part of the new airport runway project. It is now being used as part of the airport apron/turn-around area. Solid waste disposal in Kaktovik is estimated at five pounds of refuse per person, per day.

In February of 2020, a fire broke out at the Harold Kaveolook School, causing significant damage. The NSB has reviewed options to dispose of fire-related waste while minimizing impacts to facilities. The NSB estimates that 3-5 years of landfill space would be available after disposal of fire-related waste. Solid waste disposal is estimated at five pounds of refuse per person, per day in a remote location like Kaktovik. Without considering the fire debris that needs disposal, the landfill would have sufficient space for the community’s commercial and residential needs the planning horizon of this plan. The NSB is anticipating the need to expand the landfill’s permitted footprint, extending the life of the existing landfill by 20 years.

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7.7. Gravel

Gravel is required in the community for performing road maintenance, providing adequate landfill cover, and for new construction. Yet it is an incredibly limited resource on Barter Island. There is not a permitted gravel pit on Barter Island. Gravel for the recent airport and subdivision projects was mined on the mainland.

An estimated 90,000 cubic yards of gravel was stockpiled on Barter Island during mining for the airport project, for use by NSB Maintenance projects, KIC, and the community. The mainland material source is on KIC-land. However, since the land was conveyed to KIC under the authority of ANCSA Section 22(g), development remains subject to the laws and regulations governing use and development of ANWR. Activities on this land, including mining gravel for the community of Kaktovik, must be compatible with the purposes of ANWR.\(^\text{151}\) This regulatory requirement increases the planning and investment required to perform the technically challenging mining and material transport. Fortunately, the gravel stockpile is healthy. The NSB estimates there is adequate gravel for the landfill cover and foreseeable project needs in Kaktovik.\(^\text{152}\)

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Water & Sewer Utilities

Map 5
Diesel fuel is used to heat Kaktovik’s homes and community facilities as well as fuel the power plant generators. The power plant uses approximately 335,000 gallons of diesel fuel annually, with a monthly winter usage of about 30,000 gallons per month, dropping slightly to 25,000 gallons per month during the summer. The NSB distributes fuel to the village for heating homes and charges the residents the cost for delivery.

Historical data from the Alaska Energy Authority (AEA) Alaska Power Cost Equalization Program (PCE) report is valuable for determining trends in energy consumption, power generation and sales, and electricity rates. The PCE program provides funding subsidies to electric utilities in rural Alaskan communities where the kilowatt-hour charge for electricity can be three to five times higher than the charge in more urban areas of the state. This program pays for a portion of the kilowatt-hours sold by the participating utility. The exact amount of the subsidy varies by village. It is a reliable source of historical power, fuel consumption, and energy cost information for rural Alaska communities. Kaktovik is one of the 194 Alaskan communities that participated in the PCE program in 2019.153

In Kaktovik, electricity costs a flat rate of $15 for up to 100 kilowatt hour (kWh), for 101 to 600 kWh the cost is an additional 15 cents per kWh, and 35 cents per kWh for use over 600 kWh. Elders and disabled residents pay $0.35 per kilowatt (kW) when usage exceeds 600 kWh; below 600 kW, there is no charge. Additional costs are shown in Table 12.

The Kaktovik power plant was constructed in 2000 and supplies all of the power to the village. The main power loads are the school, the water treatment plant, the health clinic, the Utilities-School District Warehouse (USDW) building, and the vehicle maintenance shop, which are all serviced via an overhead electrical distribution system operating at 2400/4160V.155 Other community buildings within the village include the fire station and public safety office. The power plant circulates waste heat from generator engine jackets to the old power plant, USDW, Public Works Vehicle Maintenance Shop (VMS), water treatment plant, health clinic, and fire station buildings.

154 Ibid.
### Table 12: Utility Costs

<table>
<thead>
<tr>
<th>Utility</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2018 Fuel Rates</strong></td>
<td></td>
</tr>
<tr>
<td>Senior residential heating fuel per gallon</td>
<td>$1.50</td>
</tr>
<tr>
<td>Residential heating fuel per gallon</td>
<td>$2.50</td>
</tr>
<tr>
<td>Commercial diesel fuel per gallon</td>
<td>$6.00</td>
</tr>
<tr>
<td>Residential propane per pound</td>
<td>$10.27</td>
</tr>
<tr>
<td>Commercial propane per pound</td>
<td>$13.00</td>
</tr>
<tr>
<td>Gasoline per gallon</td>
<td>$5.50</td>
</tr>
<tr>
<td><strong>2020 Residential Electricity Rates</strong></td>
<td></td>
</tr>
<tr>
<td>0 – 100 kWh</td>
<td>$15.00 minimum</td>
</tr>
<tr>
<td>0 – 600 kWh</td>
<td>$0.15 per kWh</td>
</tr>
<tr>
<td>601 + kWh</td>
<td>$0.35 per kWh</td>
</tr>
<tr>
<td><strong>2020 Aged or Handicapped Rates (Seniors over 60)</strong></td>
<td></td>
</tr>
<tr>
<td>0 – 600 kWh</td>
<td>No Charge</td>
</tr>
<tr>
<td>601 + kWh</td>
<td>$0.35 per kWh</td>
</tr>
<tr>
<td><strong>2020 Commercial Electricity Rates, including Heat Trace</strong></td>
<td></td>
</tr>
<tr>
<td>0 – 75 kWh</td>
<td>$15.00 minimum</td>
</tr>
<tr>
<td>0 – 1,000 kWh</td>
<td>$0.20 per kWh</td>
</tr>
<tr>
<td>1,001 – 10,000 kWh</td>
<td>$0.30 per kWh</td>
</tr>
<tr>
<td>10,000 + kWh</td>
<td>$0.35 per kWh</td>
</tr>
<tr>
<td><strong>2020 Commercial and Residential Water/Sewer Piped or Delivered Rates</strong></td>
<td></td>
</tr>
<tr>
<td>0 – 3,000 gallons per month (residential)</td>
<td>$69.00 flat rate</td>
</tr>
<tr>
<td>0 – 3,000 gallons per month (seniors)</td>
<td>$14.00 flat rate</td>
</tr>
<tr>
<td>More than 3,000 gallons</td>
<td>$0.02 per gallon</td>
</tr>
<tr>
<td>Commercial</td>
<td>$0.08 per gallon</td>
</tr>
<tr>
<td>Sewer</td>
<td>No charge</td>
</tr>
</tbody>
</table>

### 7.9. Fuel Storage

The Kaktovik fuel system consists of a bulk tank farm, dispensing station, distribution pipelines, and intermediate tanks filled by truck transfer, located throughout the community. The dispensing station serves as both a gas station for the community and a tank truck filling station for home delivery of diesel heating oil. The Kaktovik bulk fuel tank farm is located north of the community near the spit. It was originally constructed in 1989 and upgraded in 1994. Both the bulk fuel tank farm and dispensing station are owned by the North Slope Borough and operated by KIC.

Fuel is delivered to the community by barge and transferred to the bulk fuel tank farm from the...
Beaufort Sea side of the island via a marine header. If needed, fuel deliveries can also be made during the winter by air. Kaktovik has fuel storage capacity for 160,000 gallons of gasoline in two tanks at the dispensing station and the bulk fuel tank farm. Kaktovik also has fuel storage capacity of 915,000 gallons of diesel, the combined capacity of sixteen tanks that each store at least 2,000 gallons of fuel. There are also numerous smaller fuel storage tanks scattered throughout the village.160

**7.10. Power**

The Kaktovik power plant is located on Fourth Street. The power plant is owned and maintained by the NSB. The plant, built in 2000, consists of an 82-foot by 60-foot insulated pre-engineered steel structure on a passively refrigerated, insulated slab-on-grade type foundation. The power plant contains generator appurtenances, day tanks, an office, bathroom, storage area, a maintenance area, radiator room, and switchgear. The power plant does not have boilers; the building utilizes waste heat only. From the power plant, two feeders serve the two 1000kVA transformers that feed north and south distribution loops for the village.161

There are 5.25 miles of overhead power lines in Kaktovik. Another 0.86 miles of power lines are planned to the pump house at the fresh water lake and along an extension of Barter Ave to the Dew Line site. Map 6 illustrates the location of the power plant and overhead lines. Currently, there are four generators installed with space available for two additional generators.162 The Kaktovik power plant generator units are listed below in Table 13.

As a cost saving measure, waste heat is captured from all four generators via the engine jacket water. Exhaust stack heat recovery is not being utilized at this time. Waste heat from the engines is distributed to the various NSB buildings via two centrifugal pumps connected to a waste heat pipe manifold.163

Two waste heat loops are used to transfer heat energy. The first loop is buried and connects the new power plant to the old power plant with a tee off to the USDW and VMS buildings. The second loop is an above-ground loop that supplies the water treatment plant, health clinic, and fire station. Both loops are constructed with well-insulated arctic pipe that results in minimal heat loss to the atmosphere or ground.164

The engine jacket water heat recovery system on average generates approximately 1.1 million British Thermal Units (BTU) per hour of useable energy. As presently constructed, the villagewide waste heat recovery system is able to absorb all of this heat for most of the year. Only during a few summer months is more waste heat generated than can be used. During this period the engine radiators are used to cool the engines; the rest of the year the waste heat system acts as the engine radiators.165
The gen sets are in good working order without any known deficiencies. With the current demand loads, the power plant is able to supply and meet the village needs by running one of the larger Caterpillar 3512 generators most of the time. In the winter, the monthly peak load is about 700 - 790 kWh and is comfortably handled by one 3512. During summer and early fall, the peak load drops to averages of 560 - 630 kWh. The load can be carried by one 3512 or two of the smaller 3508s running in tandem.167

During summer, the overall demand drops slightly, with peak loads rarely exceeding 650 kWh. Records of the daily peak loads show the actual hourly demand. The peak demand usually occurs around 9 — 10am each morning. Afternoon and early evening are also when demand is high.168 After 1,000 hours of operation, the generators are rotated to allow non-operating generators to be serviced. With regular and continuous maintenance and recommended intermittent major overhauls, the life of Kaktovik’s generators are expected to be well over 100,000 hours of operation each.169

Because each generator is assumed to last 11 years,170 the total expected life of all four generators is 44 years combined. Thus, the power plant is well equipped to meet the demand well past 2035. However, peak demand may grow if the community also grows, which may require that two generators are run in tandem to meet that demand. Running two generators in tandem more often would reduce the total life efficiency of combined generators to less than 44 years.

To forecast future peak use with future anticipated high population growth, a rate of 3.2 kWh per person/per day is used. This usage rate was calculated from the estimated peak usage in winter at 790 kWh and a population count today of 246. For average winter load calculations, 482 kWh is used with a population count of 269, for a rate of 2 kW per person/per day. Projected usage is shown in Table 14. With the generator bank available in Kaktovik and an estimated one-half percent population growth, two generators will be required to meet the peak usage rates calculated after 2040.

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168 Ibid.
169 Because there are 8,760 hours in one year and operation of each generator is over 11 years.
Table 14: Projected Power Usage for Medium Growth Rate

<table>
<thead>
<tr>
<th>Forecast Year</th>
<th>Population Count</th>
<th>Daily Peak Usage (kilowatt hour/per day)</th>
<th>Average Winter Usage (kilowatt hour/per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>246</td>
<td>790</td>
<td>482</td>
</tr>
<tr>
<td>2025</td>
<td>253</td>
<td>810</td>
<td>506</td>
</tr>
<tr>
<td>2030</td>
<td>260</td>
<td>832</td>
<td>520</td>
</tr>
<tr>
<td>2035</td>
<td>266</td>
<td>851</td>
<td>532</td>
</tr>
<tr>
<td>2040</td>
<td>273</td>
<td>874</td>
<td>546</td>
</tr>
</tbody>
</table>

7.11. Service Subsidies

Due to the enormity of capital investments and the cost of operations, North Slope residents pay a very small share of the costs of receiving service for safe water distribution, wastewater collection and treatment, electricity generation and distribution, home heating fuel, natural gas, and automotive gasoline. The approximate subsidy per residents per water and wastewater, solid waste disposal, and power generation are presented here. These subsidies total approximately $10,493 per Kaktovik resident annually, shown in Table 15. What is not included here is the cost of infrastructure development, expansion, and upgrades which can costs borough tens of millions of dollars annually through the capital program.171

Power Subsidies.

The North Slope Borough owns and maintains power generation facilities in all of its communities. The North Slope Borough operates the power generation facility. Like the water and wastewater systems, the NSB highly subsidizes power generation, connections, and operating costs. Power is managed through the Power and Light Fund. This fund includes the power-generating activities for the North Slope communities of Anaktuvuk Pass, Kaktovik, Nuiqsut, Point Hope, Point Lay, Wainwright, and Atqasuk.

During the 2017 calendar year, expenses to generate and distribute power in the seven North Slope villages totaled $26,839,423. Residents were charged a total of $8,363,574 in service fees. The borough also received an operating grant for $132,138. Thus, the 2017 power subsidy across seven villages totaled $18,363,574 – the amount that it cost the borough to provide power to village residents above the amount received in service fees and grants for the service.172 The approximate 2017 power subsidy per village resident was $6,365.

Water & Wastewater Subsidies.

The North Slope Borough operates the water and wastewater treatment and distribution system in Kaktovik. General fund expenses to operate water and wastewater infrastructure exceeded $800 per household per month in 2017. Household utility service rates are $69 per month.

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The average subsidy per resident was calculated as an average across all village residents; the exact amount in Kaktovik would be slightly different based on the cost of operating the power plant and distributing power in Kaktovik specifically.

**Solid Waste Subsidies.**

The North Slope Borough owns and maintains the solid waste facility in Kaktovik. For fiscal year 2018 – 2019, the NSB budgeted a total of $360,185 for sanitation services in Kaktovik. Residents are not charged for trash pick-up or disposal. The subsidy for providing these services is the total annual budget, approximately $1,375 per Kaktovik resident annually.

**Table 15: Utility Subsidies**

<table>
<thead>
<tr>
<th>Utility</th>
<th>Residential Fee</th>
<th>NSB Cost</th>
<th>Approximate subsidy per home</th>
<th>Approximate monthly subsidy per resident</th>
<th>Approximate Annual Subsidy per Resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water and Wastewater</td>
<td>$69/month per residence</td>
<td>Approximately $800/month per Kaktovik residence</td>
<td>$731/month</td>
<td>$222</td>
<td>$2,664</td>
</tr>
<tr>
<td>Power</td>
<td>$8,495,712 annually for seven villages</td>
<td>$18,363,574 annually for seven villages</td>
<td></td>
<td></td>
<td>$6,365</td>
</tr>
<tr>
<td>Solid Waste</td>
<td>$0</td>
<td>$360,185 for Kaktovik annually</td>
<td></td>
<td>$122</td>
<td>$1,464</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total $10,493</td>
</tr>
</tbody>
</table>

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174 Average monthly water and wastewater subsidy of $731 was divided by the 3.29 average household size to achieve the average per resident subsidy. The solid waste subsidy was calculated using the 2019 NSB Census population count of 246 residents.
CHAPTER 7: PUBLIC FACILITIES

Power Utilities
Map 6
7.12. Alternative Energy

Wind Generation.
Land-based wind energy is now the cheapest electricity on the planet. The high cost of fuel, especially in rural Alaska, as well as improvements in wind power technology make wind energy an attractive option. Adding wind turbines to diesel power plants that are being upgraded to make a hybrid wind-diesel system is one of easiest ways to include wind energy in an existing system. The wind turbines are connected directly to the grid and operate in parallel with the diesel generators, adding wind-generated electricity to the grid when available. There are now more than 30 communities in Alaska that use wind power to generate a portion of their electricity and, in some cases, residential heat as well.\(^{175}\)

An investigation into the potential and feasibility of wind power as an alternative energy source in Kaktovik was conducted in 2010.\(^ {176}\) The North Slope Borough received AEA grant funds for a feasibility assessment in Kaktovik.\(^ {177}\) The borough’s goal for the assessment was to determine the feasibility of implementing a wind-diesel system to offset a significant percentage of fuel used in the power plant but not to create a highly complex system with significant thermal offset and/or electrical storage capacity.\(^ {178}\) Wind power would supply 20 to 50 percent of the electric load with at least one diesel generator operating at all times.

A met tower was installed on the south side of the village near the sewage treatment plant in 2009. While the site was not a consideration for wind turbines, it was chosen because of ease of access and land ownership while remaining also representative of the wind conditions elsewhere on Barter Island. The met tower collected wind conditions, air densities, and feasibility of wind power usage between June 2009 and July 2010. While there were issues with the met tower data, including data loss due to icing and wind damage, two nearby Automated Weather Observing Systems (AWOS) sources at the Barter Island Airport and at the DEW Line station were able to fill the missing data. The wind was rated as a Class 5 (excellent). The wind speed mean was measured at 6.32 meter per second.\(^ {179}\)

The measured wind velocities show that Kaktovik is a viable location for using wind as an alternative energy source. The study recommended that the NSB pursue additional conceptual design tasks for a wind-diesel power system. One limiting factor in choice of wind turbine is the FAA height limitations. This height limitation eliminates consideration of larger wind turbines that would potentially be suitable otherwise.\(^ {180}\) The recommended alternative includes constructing three turbines at 70°07′30.71″ north latitude, 143°39′44.91″ west longitude, a site located closer to the community than the other two sites that were considered. This is the preferred site because it is of flat open terrain and is the closest site to the power plant which will equate to lower construction costs.

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\(^{178}\) Ibid.

\(^{179}\) Ibid.

\(^{180}\) Ibid.
and lower maintenance costs for the power line and roads.\textsuperscript{181}

Wind development would require a large funding and long-term commitment since expected life span of the wind equipment is typically a 20-year span.\textsuperscript{182} Tentative costs for purchase, shipping, and installation of a 100kW single turbine was approximately $4,565,200 in 2014,\textsuperscript{183} not accounting for escalation. Permitting and environmental reviews would be required for installation of a wind tower and turbine which, which were not included in the $4.5 million cost estimate.

There are threatened bird species in the Kaktovik area that are protected under the Migratory Bird Treaty Act regulations, which prohibit the taking of active bird nests, eggs, and young by non-Natives. The USFWS has developed timing recommendations for land disturbance and vegetation clearing to avoid migratory bird nesting periods.\textsuperscript{184} Optimal wind turbine installation dates would need to be considered in advance to reduce the likelihood of harm to migratory birds.

**Solar Generation.**

During the summer months on the North Slope, the sun does not set for approximately 80 days during the summer months; during the winter, the sun does not rise for about 67 days. Solar panels are a possible source of alternative energy for Kaktovik, although there has not been research or conceptual design work for utilizing solar energy. Due to successes in other regions of Alaska, it is likely a viable option that is available to help reduce the growing cost of conventional power generation.

Solar power has been shown to defer energy costs based on data from a Cold Climate Housing Research Center (CCHRC) prototype home in Anaktuvuk Pass. The house in Anaktuvuk Pass had installed integrated solar photovoltaic panels when it was constructed in 2009.\textsuperscript{185} Approximately seven percent of the total electrical demand, which averaged 1,100 kWh per month was offset by solar energy. The cost of electricity was $1.05 per kWh with monthly savings of approximately $80. Unfortunately, the cost to purchase and install the solar photovoltaic panels is not current. It would be difficult to determine the true cost of installing a system without more current information on the cost of transporting materials to North Slope villages. The cost of individual solar photovoltaic panels and arrays continuously decreases as new technology continues to improve the reliability and affordability even in remote Alaska sites. The costs of shipping, construction, and installation are higher in Alaska than other locations and much higher in rural Alaska. Nevertheless, using the 2009 costs, it would take approximately 25 years to offset the solar system capital investment.\textsuperscript{186} Yet, the benefits could be considerable for both energy savings and impacts to the environment.


\textsuperscript{182}Vaught, Douglas P.E. 2014. Report of Site Visits to Wind Turbine Manufacturers for NSB Wind Development. V3 Energy LLC.

\textsuperscript{183}Ibid.


\textsuperscript{186}Ibid.
7.13. Transportation

Regional airline flights are the primary mode of transportation into and out of Kaktovik and are the only source of year-round access but costs can be high and weather delays are the norm, especially in winter.\(^{187}\) Summer barge shipments re-supply the community with fuel and other supplies. Because the village is located on an island, the road system is limited and connecting transportation routes to the mainland vary depending on the time of year. There is not a developed road to the mainland, though residents have expressed a desire for a bridge for better access to subsistence resources.

Private/public use vehicles, all-terrain vehicles (ATVs), and snow machines are typical modes of transport in and around the community. Snow machines and boats are frequently employed for subsistence and recreation activities and for travel over longer distances, sometimes from village to village. A more robust transportation network, both inter-village and to the statewide transportation system, is widely believed to be integral to heightening economic opportunities in the area.

**Roads.**

Local roads and trails are used for village travel. There are approximately 10 miles of developed gravel roadways in Kaktovik ranging in width from 10 to 20 feet.\(^{188}\) There are not any paved roads. Dust from road traffic in the summer months is a major health and safety transportation concern among residents. Some efforts have been made toward mitigating the dust, such as frequent road watering, though the concern still remains, based on discussion in a village planning meeting in January 2020.\(^{189}\)

Although no permanent roads connect North Slope villages to the Alaska road network, the construction of a bridge would offer residents a connection to the mainland. This would provide greater subsistence hunting and fishing land access, since many residents of Kaktovik are dependent on these activities for food. Moreover, a bridge to the mainland could facilitate easier resident access to the Dalton Highway\(^{190}\) via trails that connect the mainland near Kaktovik to Deadhorse (the terminal point on the highway) and thus to the greater Alaska Highway System.\(^{191}\) This could also offer a welcome alternative to dependence on high priced airline flights. To a large degree, it would function as an alternative to airfreight and seasonal barge hauling to satisfy community supply needs, including building materials and other supplies.\(^{192}\) A mainland bridge would be approximately 785 feet long\(^{193}\) and the road roughly one and a half miles in length connecting the village to the proposed bridge location would need to be constructed.

Originally, an alternative design plan included in the Airport Master Plan Environmental Impact Statement proposed a bridge to the mainland but was rejected by the Federal Aviation Administration due to high cost projection and


\(^{189}\) Ibid.

\(^{190}\) Ibid.
concerns over potential environmental impacts on neighboring high-value wetlands.\textsuperscript{194} Community desire for a mainland connecting bridge has not waned. According to a January 2020 City of Kaktovik resolution, the construction of a bridge to the mainland, primarily for subsistence purposes, is a priority capital improvement project.\textsuperscript{195}

**Off-Road Travel.**
Kaktovik residents are known to travel significant distances via winter off-road routes to Prudhoe Bay, rivers in ANWR, and to the Mackenzie Delta, among other places, often by means of ATVs or snow machines. Trails, including 17b trails, provide access to native allotments, cabins, hunting and fishing grounds, and to the mountains beyond. They area illustrated in Map 7.

**Airport.**
Barter Island Airport is owned and maintained by the North Slope Borough. It consists of a gravel airstrip roughly 4,500 feet in length and 100 feet wide.\textsuperscript{196} It was built in 2015 to address location and operational concerns associated with the military owned dual-use airport installation located on the spit. Erosion and storm surge damage to the old runway was a frequent occurrence, often forcing runway closures.

A two-light Precision Approach Path Indicator (PAPI) and Runway End Indicator Light (REIL) systems are installed at the airport as well as primary and secondary wind cones, Medium Intensity Runway Lights (MIRL) and on-site standby power generation. A new access road to the re-located landfill was associated with the construction of the airport and provides vehicle access between the village and the new landfill and airport. This new airport is located in the center of the island, southeast of the village proper, at an elevation above the 100 year flood mark, greatly increasing its resistance to seawater flooding while making it less prone to coastal fog delays.\textsuperscript{197, 198}

There is a 17b trail that runs through the new airport. The Native Village of Kaktovik is coordinating with the Bureau of land Management to change the location of the trail or remove its 17b status because it is no longer useable as it was intended.

Residents of Kaktovik were originally serviced by the Barter Island Long Range Radar Station Airport that was maintained and operated by the NSB. The runway itself was owned by the Department of Defense (U.S. Air Force) and functioned under a joint use agreement.\textsuperscript{199} The airport was located on an exposed gravel spit northeast of Barter Island between two rivers on the Beaufort Sea.\textsuperscript{200} The runway (located only two to four feet above mean sea level) was subject to semi-regular bi-annual flooding and submersion\textsuperscript{201} from sea storms. Frequent seawater flooding caused corrosion and frequent failures to airport electrical lighting

\textsuperscript{195} City of Kaktovik. 2020. Resolution No. 2020-01.
\textsuperscript{196} Ibid.
\textsuperscript{199} Ibid.
systems, causing delivery delays for important and time-sensitive materials, such as food and healthcare supplies. The location also suffered from wildlife hazards due to high waterfowl, gull, and polar bear activity in the vicinity, with activity ramping up in the spring through fall months.\(^\text{202}\) It is no longer the primary use airport.

According to FAA information, the Kaktovik airport averages 64 flights per week. The majority of flights (75 percent) are air taxis coming and going from the village; 24 percent are transient general aviation flights, and about one percent are military related.\(^\text{203}\) There were 3,135 passenger enplanements for the 2018 calendar year, a decrease of 2.4 percent from the previous calendar year.\(^\text{204}\)

The primary airline providing flights to Kaktovik had been RavnAir Alaska, which declared in bankruptcy in April 2020. Other small airlines have purchased assets from the defunct company, including Everts Air Cargo, Bering Air, Wright Air, among others.\(^\text{205}\) Wright Air is now offering service to Kaktovik after the community was left without air service.

**Marine Travel and Transportation.**

Marine travel is an integral part of village life and culture. Nearby waterways are traditionally navigated in search of good seal and whale hunting and for fishing as well as to visit friends and relatives. Although marine travel is a well-established function of village life, there is not a permanent, public use boat ramp available to residents. Because of this, boats are often stored in the Kaktovik Lagoon in a spot that is prone to grounding of docked vessels, particularly after strong winds. This has caused some boats to get stuck upland on the beach and to occasionally suffer damage.\(^\text{206}\) Additionally, the launching spot on the Lagoon is commonly regarded as too shallow; relocating it would facilitate easier and safer boat launching. Common sentiment is that the community should secure ownership of a desirable location and then construct launching and docking infrastructure as well as adjacent parking and restroom areas.

The coastal waters of the Beaufort Sea are covered in ice for the majority of the year. The ice-free season, typically from mid-June through September\(^\text{207}\) is when fuel and other cargo are shipped in via barge.\(^\text{208}\) Barge off-loading crews tend to land at the most easily accessible points on the coast, holding position during offloading by nosing and powering up onto the sandy gravel beaches.\(^\text{209}\) Landings in Kaktovik are weather dependent, making shipment deliveries unpredictable.\(^\text{210}\)


\(^{204}\) Federal Aviation Administration. Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports. www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger.


\(^{208}\) Ibid.

\(^{209}\) Ibid.

\(^{210}\) Ibid.
CHAPTER 7: PUBLIC FACILITIES

Map 7

Data Sources:
North Slope Borough

Key:
- 17b Easements
- Winter Trails

Map showing locations such as Beaufort Sea, Fresh Water Lake, Airforce Hangar, and Sewage Lagoon.

The NSB’s revenue is largely dependent on taxes from oil and gas infrastructure, and this revenue diminishes as facilities age. This revenue also affects the borough’s bonding rating (i.e., the interest rate on borrowing money). Since bonds are the primary funding source for NSB capital projects, it is increasingly important that Kaktovik seek alternative funding for capital projects when possible.

Table 16 provides a list of potential capital projects that may be needed or desired in Kaktovik over the next 5-, 10-, or 20-year period. This list includes major capital investments; current NSB facilities, such as buildings and large vehicles or equipment, should continue to receive normal maintenance and upgrades by NSB to ensure safe and efficient operations for their remaining useful life and thus are not included in the list of potential capital projects. This list does not include vehicles or rolling stock such as graders, water trucks, or buses. Some of the facilities and assets identified in the table would likely be sponsored and funded by NSB general obligation bonds, while others could be sponsored and funded wholly or in part by other entities. Funding for research and capital projects identified in this plan would likely come from state and federal funding sources, the Regional Native Corporation, the NSB Capital Improvement Program (CIP), and other grant sources. While the projects are not prioritized and may require greater detail, including cost estimates, the requesting or sponsoring entity will develop additional information when necessary.

Annually, the NSB meets with each village’s city council to provide updates on capital-funded projects. Staff also request a priority listing of projects from each community for potential inclusion and consideration in the annual capital funding cycle. In 2020, the City of Kaktovik prioritized the following capital projects by resolution for funding by the North Slope Borough Capital Improvement Program:

1. Bridge to the mainland for subsistence
2. Multi-purpose subsistence facility
3. Housing
4. Utilidor upgrades / water & sewer plant
5. Search & rescue building
6. Culverts / drainage / road upgrades
7. Pilings / housing upgrades
8. Public Works heavy equipment

Table 16: Potential Capital Projects over a 5, 10 and 20-Year Period

<table>
<thead>
<tr>
<th>Type of Facility</th>
<th>1 to 5 Year Period</th>
<th>6 to 10 Year Period</th>
<th>11 to 20 Year Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water / Sewer</td>
<td>Utilidor upgrades / water and sewer plant</td>
<td>Year-round water pumping source</td>
<td>Evaluate long-term drinking water supply capacity, water quality, treatment and distribution needs</td>
</tr>
<tr>
<td>Power Generation</td>
<td>Research and construct feasible alternate energy systems, especially wind</td>
<td>Evaluate diesel generators for potential replacement</td>
<td></td>
</tr>
<tr>
<td>Landfill</td>
<td>Landfill containment improvements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Facility</td>
<td>1 to 5 Year Period</td>
<td>6 to 10 Year Period</td>
<td>11 to 20 Year Period</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Roads / Trails</td>
<td>Trail marking and hardening</td>
<td>Bridge to the mainland for subsistence access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research and implement dust control measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inspect and repair / replace culverts as needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>Assess extent of overcrowding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rehabilitate existing vacant housing for occupancy providing energy-efficient systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Construct new energy-efficient homes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retrofit existing housing with energy-efficient systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airport</td>
<td>Evaluate the feasibility of a heated airport terminal or shelter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Old airport site remediation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Clinic</td>
<td>Provide upgrades and construct addition to include exam rooms, storage, emergency room, pharmacy and additional office space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreational Facilities</td>
<td>Develop an outdoor ball field to accommodate sports such as football, softball, and soccer</td>
<td>Youth center for gathering and entertainment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure indoor recreational facilities are included in new school design</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide indoor playground for children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Buildings</td>
<td>Replace Harold Kaveolook School</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repair issue with transformers and have generators for backup</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secure facility dedicated to Kaktovik Search &amp; Rescue</td>
<td>Multi-purpose subsistence facility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secure a childcare facility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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8.1. Health

Personal Health.

Kaktovik’s overall community health depends on many factors that include access to resources such as quality and affordable housing; employment opportunities, quality education, recreational opportunities, income and employment, living conditions, food, cultural well-being, environment, public infrastructure, and a safe community and homes. This chapter examines personal health as well as some community health issues. Other chapters in this plan examine health related to such issues as housing and infrastructure.

As part of the 2019 North Slope Borough Economic Profile and Census Report, a health survey was conducted to better understand the health issues facing North Slope communities, to work more effectively with villages on addressing community health issues, and to inform planning and policy decisions that impact community health. Health conditions were gathered using a self-reporting survey by heads of households. The North Slope Borough has sponsored gathering self-reported health information from residents in previous census reports as well, offering longitudinal data on certain issues.

In 2010, 36 percent of residents consisted themselves to be in Very Good or Excellent health while 21 percent were in Fair or Poor health. In 2015, only one resident considered themselves to be in Poor health and only two residents considered themselves in Fair health. Residents overwhelmingly considered themselves to be in either Very Good or Excellent health, totaling 81.6 percent of the village population. In 2019, 41.6 percent of residents considered themselves to be in Very Good or Excellent health, representing nearly 50 percent decrease in just four short years. One significant health issue in Kaktovik is smoking. On average, 50 percent of NSB Iñupiat individuals that are over the age of 16 smoke. However, in Kaktovik, that average is much higher, at 72 percent.

Specific health indicators from 2010 to 2019 are provided in Table 17.

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213 Ibid.
Table 17: Self-Reported Health Indicators

<table>
<thead>
<tr>
<th>Health Indicator</th>
<th>Kaktovik</th>
<th>NSB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good or excellent general health</td>
<td>40%</td>
<td>72%</td>
</tr>
<tr>
<td>Good health</td>
<td>42%</td>
<td>17%</td>
</tr>
<tr>
<td>Fair to poor general health</td>
<td>18%</td>
<td>2%</td>
</tr>
<tr>
<td>Tobacco use</td>
<td>65%</td>
<td>Not available</td>
</tr>
<tr>
<td>Obesity – heads of households</td>
<td>32%</td>
<td>45.7%</td>
</tr>
</tbody>
</table>

Adequate access to healthy food is critical in achieving and maintaining a nutritious diet. Healthy eating is associated with a lower risk for chronic diseases such as diabetes, hypertension, and obesity. According to the U.S. Department of Health and Human Services’ Office of Disease Prevention and Health Promotion, healthy eating and regular physical activity can help maintain good health while also reducing the risk of chronic disease. The 2015-2020 Dietary Guidelines provide five overarching guidelines that encourage healthy eating:

- Follow a healthy eating pattern across the lifespan;
- Focus on variety, nutrient density, and amount;
- Limit calories from added sugars and saturated fats and reduce sodium intake;
- Shift to healthier food and beverage choices;
- Support healthy eating patterns for all.

Harvesting local subsistence food has been central to the culture of many Alaska communities. However, the evolution to partial cash economy often means greater reliance on store-bought food. In Kaktovik, like much of rural Alaska, the quality and availability of store-bought food is subject to fluctuations outside the control of local residents. Access is dependent on the schedule of the barge or flight and the weather, as well as person’s ability to pay high prices that can be twice as much or more than the cost of food in Anchorage. Options are limited to what is available on the shelves. Perhaps most importantly, store-bought foods do not fulfill the important roles that traditional foods play in Kaktovik.

Generally, locally harvested foods are more affordable than store bought foods. Many believe that wild foods provide a better protection against the cold weather, and that harvesting and processing local foods requires considerable exertion which sharpens physical and mental well-being. The North Slope Borough Wildlife Management Department regularly tests samples of harvested wildlife to monitor the overall health of subsistence animals and their ability to provide nutrients and dietary health to borough residents.

In a special election in June 2020, residents voted to remove a prohibition the import, sale, and possession of alcohol. The alcohol ban had been in place since 1989. It is too early to determine

---

the effect that removing the alcohol ban will have on personal or community health.

Physical activity is essential to good health. Regular exercise helps maintain healthy weight and reduces the risk of high blood pressure, type 2 diabetes, heart attack, and stroke. Planning efforts that promote physical activity might include pedestrian safety initiatives, access to a park and playground, a swimming pool or other recreational facilities could facilitate increased physical activity. Before the fire destroyed Kaveolook School had recreational facilities for the community that included a regulation-size gymnasium, weight room, and track. While the design for the replacement school has not been completed, the future school is likely to include many, if not all, of the recreation amenities that were previously available.

Healthy Environment.
The environment can also play a significant role in shaping a safe and healthy community. Environmental factors that can affect community health include exposure to hazardous substances in the air, water, soil and food; physical hazards, such as noise or slips/falls; and weather hazards. In addition to basic needs, a healthy environment supports safety and social interaction.

Physical features of a community can affect personal health and quality of life. How a community is planned, designed, built, and used, such as land use, road network, pedestrian safety, and the location or existence of parks, recreation facilities and other services can contribute to an active lifestyle or a more sedentary one. People tend to be more active when they can easily walk or have access to recreational facilities. Comprehensive planning and land use regulations can be used to positively guide land use.

Poor indoor air quality and ventilation is a significant issue for many Alaska homes. Older homes, built during the 1970s and 1980s, often have a higher risk of moisture and air quality issues than newer homes. Just over 60 percent of homes in Kaktovik were constructed more than thirty years ago. Another 19 percent are between twenty and thirty years old. Other housing issues relate to overcrowding; 26 percent of homes in Kaktovik are either overcrowded or severely overcrowded. Relieving overcrowded housing conditions can increase both physical and mental health. The physical benefits of relieved overcrowding include the reduced spread of illness; the less people, the fewer opportunities to transmit diseases. Better hygiene is also related to alleviated overcrowding because it is easier to keep a home clean and in good condition when it is not constant use. Also associated with easing overcrowded conditions is healthy sleep patterns; reduced noise and activity coupled with additional sleeping space allows for better sleeping. The mental health benefits of mitigating overcrowding include preventing depression and domestic conflict as well as helping children to do better in school because they have space and a quiet environment to study and learn. More information on overcrowding can be found in Chapter 9.

Airborne dust is problematic, causing respiratory problems such as bronchitis, asthma, and a high incidence of sinus infection. Roadway and airport dust is also blown onto drying subsistence foods, which can cause them to be inedible.

Pedestrian safety is an issue that affects the entire community. Many unnecessary injuries and fatalities occur as a result of intoxication or inattentiveness of either the driver or the pedestrian. Residents are much more likely to walk throughout a community when they feel safe. Pedestrian safety measures include ensuring that roadway shoulders and rights-of-way are clear of obstructions, such as dumpsters or large utility service barrels that would force residents to walk into the roadway; ample visibility for oncoming traffic so they can see pedestrians; and sufficient lighting for pedestrians.

Access to Healthcare.
There is a health clinic in Kaktovik that is staffed by community health aides and is open during the weekday and for emergencies. Kaktovik health services are provided by three different organizations: North Slope Borough Health and Social Services Department, Arctic Slope Native Association (ASNA), and the Iñupiat Community of the Arctic Slope (ICAS). The following are the services provided by each organization.

North Slope Borough Health and Social Services Department provides the following services:
- Village health clinic facility and staffing the community health aide
- Eye clinic
- Arctic Women In Crisis (AWIC) assistance
- Women, Infant & Children Program
- Children & Youth Services
- Public Health Nursing
- Senior Services
- Public Health Office/Veterinary Clinic Services
- Behavioral health services
- Counseling and suicide prevention

ASNA provides the following services:
- Primary health care services
- Dental services
- Medical travel
- Screening For Life Services:
  - Mammograms and clinical breast exams
  - Pap tests
  - Prostate cancer screening tests
  - Colorectal cancer screening tests
  - Lung cancer screening tests
  - Health education
- Help with coordinating associated care
- Behavioral health services
- Medical housing
- Funeral assistance
- Funeral travel
- Child Care Development Fund

Iñupiat Community of the Arctic Slope
- Stephanie Tubbs Jones Child Welfare Services
- Promoting Safe and Stable Families
- Indian Child Welfare Act

Emergency Preparedness.
The North Slope Borough Risk Management Division is responsible for emergency management and disaster coordination within the NSB. An All-Hazards Mitigation Plan for Kaktovik was developed in 2005 in effort to more closely coordinate mitigation planning and
imple

mentation efforts between the state, local,
and tribal entities. The plan identified hazards
and associated risks specific to Kaktovik. In 2015,
the North Slope Borough updated the All-
Hazards Mitigation Plan, combining the risk
assessments for all North Slope communities
into one guidance document. The plan identifies
erosion, coastal storm and storm surges,
snowmelt flooding, severe storms, and
subsidence as major issues in Kaktovik. The plan
also considered critical facilities vulnerabilities,
potential economic losses, management tools,
and financial resources.

The Coronavirus Disease 2019 or COVID19 is a
respiratory illness that can spread from person
to person. While there are many types of human
coronaviruses, including some that commonly
cause mild upper-respiratory tract illnesses,
COVID19 is a new disease that has not been
previously seen in humans. The spread of
COVID19 has led to travel restrictions, delayed
deliveries, and economic impacts on the
community. The only airline that served
Kaktovik, Ravn Alaska, declared bankruptcy early
in the pandemic due to a dramatic drop in
demand and the resulting loss of revenue.
Wright Air has filled the void left by Ravn, but the
change has revealed vulnerabilities to North
Slope communities in relying on one air carrier
to provide travel into and out of the community
and deliver the majority of goods to the
community. A vulnerability assessment and plan
should be developed to ensure that the
community is prepared for disruptions to travel
in and out of the community in the future.

8.2. Education

Enrollment.
Harold Kaveolook School provides education for
Kaktovik students from pre-school through 12th
grade. The 2018/2019 school year (SY), the most
recent year that data is available, had an
enrollment of 60 students. School enrollment
decreased steadily between the 1999/2000 and
2008/2009 school years by 35 students, or nearly
forty percent. Enrollment increased the
following school year and has remained
relatively steady over the last decade, at
between 57 and 67 students. Often school
enrollment increases or decreases with the
population, providing insight into future
educational resource needs and the size and
make-up of the future workforce. With the
overall population decreasing in Kaktovik and
fewer residents under 18 than in years past, the
education resources of the interim school are
more than sufficient to meet the community’s
needs while the new school is under
construction. During the 2018/2019 school year,
the total spending per student was $72,346 from
both state/local funds and federal funds.

change/files/Arctic-Resources/Community-Adaptation-Plans/Kaktovik_Final_HMP.pdf.
Educational Attainment.
The percent of residents that earned a high school diploma as the highest level of educational attainment has increased from percentages in the mid-30s to over 50 percent in both 2015 and 2019. The percent of Kaktovik residents that have sought additional education beyond high school has remained fairly constant over a 16-year period, as shown in Table 18. In 2003, 27 percent of residents had some training or formal education beyond high school; in 2010, the percent had increased slightly to 30 percent, decreasing to nearly 19 percent in 2015. However, 2019 witnessed a rebound of residents that have sought higher education, increasing to 31 percent.
Table 18: Educational Attainment, 2003 – 2019

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Has not started school</td>
<td>17</td>
<td>28.8%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Elementary school</td>
<td>0</td>
<td>0%</td>
<td>7</td>
<td>10.4%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Middle school</td>
<td>0</td>
<td>0%</td>
<td>3</td>
<td>4.5%</td>
<td>2</td>
<td>3.8%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>High school</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>1.9%</td>
<td>2</td>
<td>4.1%</td>
</tr>
<tr>
<td>Did not finish high school</td>
<td>0</td>
<td>0%</td>
<td>7</td>
<td>10.4%</td>
<td>6</td>
<td>11.3%</td>
<td>5</td>
<td>10.2%</td>
</tr>
<tr>
<td>High school diploma</td>
<td>20</td>
<td>33.9%</td>
<td>23</td>
<td>34.3%</td>
<td>28</td>
<td>52.8%</td>
<td>25</td>
<td>51%</td>
</tr>
<tr>
<td>GED</td>
<td>4</td>
<td>6.8%</td>
<td>3</td>
<td>4.5%</td>
<td>3</td>
<td>5.7%</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Vocational/tech graduate</td>
<td>2</td>
<td>3.4%</td>
<td>3</td>
<td>4.5%</td>
<td>3</td>
<td>5.7%</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Some college</td>
<td>7</td>
<td>11.9%</td>
<td>12</td>
<td>17.9%</td>
<td>4</td>
<td>7.5%</td>
<td>9</td>
<td>18.4%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>4</td>
<td>6.8%</td>
<td>4</td>
<td>6%</td>
<td>4</td>
<td>7.5%</td>
<td>3</td>
<td>6.1%</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>3</td>
<td>5.1%</td>
<td>2</td>
<td>3%</td>
<td>2</td>
<td>3.8%</td>
<td>3</td>
<td>6.1%</td>
</tr>
<tr>
<td>Professional degree</td>
<td>1</td>
<td>1.7%</td>
<td>2</td>
<td>3%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>1.7%</td>
<td>1</td>
<td>1.5%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>100%</td>
<td>67</td>
<td>100%</td>
<td>53</td>
<td>100%</td>
<td>49</td>
<td>100%</td>
</tr>
</tbody>
</table>

School Facility.

A fire destroyed much of the school on February 7, 2020. The former school was constructed in 1965 with 2,800 square feet of space. An additional 39,037 square feet was added between 1977 and 2004 for a gymnasium, high school, vocational education, storage, and library addition. A substantial addition to the gymnasium was completed in 2016. The $16 million addition included a regulation-size gymnasium, an elevated track, and weight room.

An interim school has been constructed adjacent to the water treatment plan on Tract 1. Modular buildings were delivered to the community via rollogon; hallways connecting the modular buildings have been constructed onsite. There are six 1,440 square foot classrooms, six bathrooms, a 26,000 square foot dining room with space for 150 people, a kitchen, offices and teacher work areas, early childhood education room, and an elementary playground deck. The North Slope Borough anticipates utilizing this building for three to five years while a new school is designed and constructed to replace the buildings lost in the fire.221, 222 The future use of the facility is unknown but there are many uses that could fulfill wishes of the community, such as a gathering place for the community’s youth or office space.

Ilisaġvik College and the North Slope Borough School District entered into a partnership to
support students advancing academically. NSBSD students have the opportunity to take courses for both high school and college credit. Ilisagvik also offers online courses via the teleconference center. The North Slope Borough employs a village deputy who is available to assist students with enrolling, ordering textbooks, and basic computer troubleshooting.223

The North Slope Borough employs a village liaison who is available to assist students with enrolling, ordering textbooks, and basic computer troubleshooting. Ilisagvik College also has a village liaison and board of trustee in each North Slope village.

8.3. Economy

As in the other North Slope villages, both subsistence activities and cash contribute to the local economy. The subsistence section of the local economy includes harvesting plants and animals, trading subsistence resources within and outside of the village, bartering food and services, and sharing food with Elders and others who are unable to participate in harvest activities. The cash economy involves earned income, dividends, and government payments. Due to its isolation, economic and employment opportunities are limited in Kaktovik. This section of Chapter 8 includes an overview of the contribution subsistence to the local economy followed by employment income and other income.

Subsistence Contribution to the Economy.
Subsistence contributes to the economy through provision of goods and services. Considering the high costs of goods, fuel, and transportation, subsistence harvests reduce food costs by providing a local source of nutrition. In addition to its economic contribution, subsistence provides cultural identity and spiritual sustenance. Subsistence activities are not oriented toward sales, profits, or commercial accumulation of cash, but instead are focused on meeting nutritional and clothing needs. In addition to human food, harvests supply clothing, food for dogs, and handicrafts for sale. The combination of wage employment, dividend income, and subsistence activities sustains the community and provides the economic basis for the subsistence way of life so highly valued in the village. Many rural Alaska households live by combining wild harvest resources with commercial-wage employment. Cash paying jobs tend to be few and are either temporary or seasonal. This is beneficial because it allows more flexibility for subsistence activities.

However, wages tend to be lower and less secure.\footnote{State of Alaska. Department of Fish and Game. N.d. Alaska’s Economies and Subsistence. www.adfg.alaska.gov/static/home/library/pdfs/subsistence/ak_economies_subsistence.pdf.}

It is important to understand the connection between wage income and subsistence; the high cost of fuel and equipment requires cash income. Subsistence activities require substantial cash to purchase costly supplies for transportation, subsistence harvest and preparation and storage of food. Cash from dividends and local employment provide the means to purchase tools, equipment and supplies which make traditional subsistence harvest activities more time efficient. Families use cash to purchase the all-terrain vehicles, snow machines, boats, fuel, rifles, harpoons, ammunition, nets, sheds, fish wheels, traps, knives, rope, baskets, tubs, freezers, and other tools of the trade. Often, a hunter must work in wage employment during the weekday and hunt and fish in the evenings or on the weekends; this emphasizes the need for a speedy land or water craft to make efficient use of this limited time for hunting and harvesting.\footnote{North Slope Borough. 2015. Kaktovik Comprehensive Development Plan. Prepared by the Department of Planning and Community Services. www.north-slope.org/assets/images/uploads/APRIL_2015_KAK_Comp_Plan_adopted.pdf.}

Some financial aspects of subsistence have been quantified. For example, the 2015 NSB Census includes data about subsistence-related expenses. Subsistence users incur significant expenses for fuel and equipment, including snow machines, ATVs, boats, motors, nets, and camping equipment. In 2003, the average spent on subsistence activities per household was $4,788, decreasing in 2010 to an average household expense of $4,315 and further decreasing in 2015 to $3,512.\footnote{North Slope Borough. 2015. 2015 Economic Profile and Census Report. Prepared by Carl E. Shepro, David C. Maas, and Donald Callaway with Jason Bergerson. www.north-slope.org/your-government/nsb-2015-economic-profile-census-report.} This brief discussion on the economic aspects of subsistence supplements the information presented in Chapter 6 that is dedicated to subsistence.

**Employment and Income.**

Kaktovik’s Iñupiat households’ average annual household income in 2019 was $59,701 with a per capita income of $17,432. In 2019, Iñupiat households in the NSB reported average annual income of $67,389 and per capita income of $15,944. Table 19 provides average and per capital income for Iñupiat households in Kaktovik and the North Slope Borough.

<table>
<thead>
<tr>
<th>Income</th>
<th>NSB</th>
<th>Kaktovik</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Household Income</td>
<td>$61,065</td>
<td>$51,446</td>
</tr>
<tr>
<td>Per capital income</td>
<td>$5,590</td>
<td>$12,740</td>
</tr>
</tbody>
</table>

Table 19: Kaktovik and NSB Iñupiat Average Household and Per Capita Income, 2010 – 2019

\[\text{Table 19: Kaktovik and NSB Iñupiat Average Household and Per Capita Income, 2010 – 2019}\]
In 2019, only Kaktovik and Utqiagvik have a majority of Iñupiat households receive more than half their total household income from wages. Dividends account for 33 percent of income. The remaining sources of income—food stamps, child support, PFDs, and retirements account for approximately 11 percent of income. Four North Slope communities, Anaktuvuk Pass, Utqiagvik, Point Hope, and Kaktovik have Iñupiat household poverty levels below 25 percent.\textsuperscript{227} Kaktovik has the highest proportion of Iñupiat households heads that are employed full-time, at 71 percent.\textsuperscript{228} It also has one of the highest average incomes of North Slope communities, with Anaktuvuk Pass, Utqiagvik, and Point Hope. Additionally, Kaktovik Iñupiat households’ average income has increased by 21 percent in constant dollars since 2010.\textsuperscript{229} Full-time permanent employed has increased significantly since 2015 as well, increasing 31.7 percent over four years. All other employment types decreased over the same period: temporary, seasonal; part-time; unemployed; and retired. The changes are shown in Table 20.

Table 20: Employment Status, 2010 - 2019

<table>
<thead>
<tr>
<th>Employment Type</th>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent full-time</td>
<td>45.1%</td>
<td>36.5%</td>
<td>68.2%</td>
</tr>
<tr>
<td>Temporary, seasonal</td>
<td>4.9%</td>
<td>15.4%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Part-time</td>
<td>14.6%</td>
<td>2.9%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>22.6%</td>
<td>30.3%</td>
<td>18.2%</td>
</tr>
<tr>
<td>Retired</td>
<td>12.8%</td>
<td>14.9%</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

Employers in Kaktovik are primarily the North Slope Borough, NSBSD, Kaktovik Iñupiat Corporation, and the City of Kaktovik. There are also intermittent construction or skilled labor jobs with the oil industry, private construction firms, the Arctic Slope Regional Corporation and its subsidiaries, and summer jobs related to tourism.

\textsuperscript{228} Ibid
\textsuperscript{229} Ibid
Table 21: Average Income and Sources for Iñupiat Households in 2019

<table>
<thead>
<tr>
<th>Kaktovik Iñupiat Households</th>
<th>Average</th>
<th>Sum</th>
<th>Percent of 43 households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total wage income all household members</td>
<td>$59,701</td>
<td>$1,552,240</td>
<td>61%</td>
</tr>
<tr>
<td>Social security monies</td>
<td>$6,735</td>
<td>$26,940</td>
<td>9%</td>
</tr>
<tr>
<td>Pension or retirement monies</td>
<td>$13,704</td>
<td>$27,408</td>
<td>5%</td>
</tr>
<tr>
<td>Food stamp monies</td>
<td>$2,075</td>
<td>$8,300</td>
<td>9%</td>
</tr>
<tr>
<td>Child support monies</td>
<td>$2,000</td>
<td>$2,000</td>
<td>2%</td>
</tr>
<tr>
<td>Income from any other sources</td>
<td>$1,250</td>
<td>$5,000</td>
<td>9%</td>
</tr>
<tr>
<td>Amount of PFD for household</td>
<td>$5,661</td>
<td>$220,800</td>
<td>91%</td>
</tr>
<tr>
<td>Total regional corporation dividends</td>
<td>$21,573</td>
<td>$927,657</td>
<td>100%</td>
</tr>
<tr>
<td>Total village corporation dividends</td>
<td>$34</td>
<td>$1,455</td>
<td>100%</td>
</tr>
<tr>
<td>Total household income from all sources</td>
<td>$65,995</td>
<td>$2,771,800</td>
<td>98%</td>
</tr>
</tbody>
</table>

Other Contributors to the Kaktovik Economy.

According to the Alaska Department of Commerce, Community, and Economic Development (DCCED), there are 13 business with active licenses in Kaktovik (17 active licenses). 230

Active business licenses
- Akook Arctic Adventures
- Arctic Chalet Tours (3 active)
- Connelly Hospitality and Catering
- Kaktovik Arctic Tours
- Kaktovik Bed & Breakfast
- Kaktovik Holdings, LLC
- Kaktovik Iñupiat Corporation (2 active)
- Kaktovik Tours LLC
- Kikiktak Store
- Marie's Walking Tours
- Polarart Productions LLC
- Sims Store Enterprise
- Waldo Arms Hotel (2 active)

The local economy is bolstered by tourism; Barter Island is considered a premier location for viewing polar bears in their natural habitat. As the sea ice diminishes, the bears are spending more time on land as they wait for the sea ice to form. Both the Endangered Species Act and Marine Mammal Protection Act require that bears not be disturbed or harassed.

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Residents have experienced issues with the surge of people visiting the community; flight availability, conflicts with subsistence activities, bear well-being, resident privacy, and generally the scale and balance of tourism are common concerns. Yet residents also want to offer high-quality viewing experiences and safe conditions for tourists. Tourists more often report a good experience when they stay for at least one night. It also provides more economic benefit to the community. Some tour companies offer a one day package, often utilizing charter flights.

The U.S. Fish and Wildlife Service assists with regulating water-based tourism activities, such as polar bear viewing by boat. USFWS does not regulate land-based tours. The number of tourists visiting Kaktovik has increased substantially over the last decade. In 2010, there was an average of about fifty visitors each year. By 2015, there were approximately 650 visitors annually. In 2010, the USFWS began a formal permitting process for tour boat operators to assist the community with concerns about increasing tourism and the wellbeing of polar bears. While the COVID-19 pandemic has impeded tourism temporarily, it is expected to return to pre-pandemic levels in the coming years. There are five companies registered in Kaktovik that offer tours. There are also tour operator companies located in Fairbanks, Seattle, and beyond that will make arrangements for tourists to visit Barter Island.

The dramatic rise in tourism led to the USFWS placing a temporary freeze on new water-based guide permits in 2017. That freeze is still in place. The community has indicated that instead of limiting the number of permit holders for water-based tourism, they would rather find a way to limit the number of tourists visiting the community. The USFWS believes that establishing a web-based reservation system will aid in keeping the scale of tourism near current (pre-COVID) levels. The USFWS would also like to continue and strengthen requirements to ensure capable captains and safe watercraft and add education requirements for visitors, guides, and boat captains.

Residents have also expressed concern that there are often not enough seats available for community use because they are already reserved by tourists. USFWS tracked this issue and found that much of the problem was with Ravn Alaska, whose reservation system did not adequately show available seats, especially after reservations were either rescheduled or canceled. Ravn Alaska is no longer providing air service to Kaktovik. Wright Air has taken over the route so these issues may no longer be of concern. A web-based reservation system for tourists may also help to ensure better balance.

Additional concerns regarding the increase in tourism is that visitors are often not respectful of subsistence activities as well as the increasing potential for human-bear conflict. The Kaktovik Youth Ambassadors put together a program to educate visitors about the community, including a video on the City’s website that discusses the importance of subsistence and cultural activities and tourists can be respectful. It also includes information on polar bear safety and guidelines for visiting the community.

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Additional tourism-related initiatives that could prove useful to the community are to work with State of Alaska to increase municipal funding focused on managing the influx of visitors. The community could also partner with the North Slope Borough to update regulations for land-based tourism. There are many successful bear viewing programs around the world that whose guidelines and policies could be replicated in Kaktovik that may assist in reducing the negative aspects to the surge of visitors while also providing quality experiences and harnessing the economic benefits to residents.

The Arctic National Wildlife Refuge is also a tourist destination. It does not have roads, trails, boat launches, campsites, or other recreational facilities. Visitors that hike, boat, camp, or engage in other outdoor recreation are not required to register visits, so ANWR staff estimate refuge use on commercial service provider reports. Nearly all visitor use is commercially-supported by charter flights and more than half of the ANWR’s visitors are both chartered in and guided. Recreation visits in ANWR totaled about 59,000 visits in 2017 which contributed to the economic effect of the refuge. However, because many tourists charter flights to ANWR, there is not a significant economic impact to Kaktovik, the only community within the refuge boundaries.

The number of recreational visitors to the Arctic National Wildlife Refuge is generally low. Most visitation occurs north of the Brooks Range. About 1,000 visitors visit the Refuge throughout the summer period (June to September). It may be still too early to know if petroleum exists in commercially-viable quantities. But if it is found and developed, Kaktovik residents are simultaneously positioned to be among the biggest beneficiaries as well as to experience some of the biggest disruptions.

hiking/backpacking, and hunting/fishing. Trips are tend to make multi-day or multi-week stays. About 1,000 visitors visit the Refuge throughout the summer period (June to September).236

It may be still too early to know if petroleum exists in commercially-viable quantities. But if it is found and developed, Kaktovik residents are simultaneously positioned to be among the biggest beneficiaries as well as to experience some of the biggest disruptions.237

236 Ibid.
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Chapter 9

Housing

Housing is a fundamental need. It is essential for one to feel secure, be healthy, and be part of a community. Housing quality and availability, including low-income and emergency housing, is a top priority for every household and community. In rural Alaska, communities grapple with not only the high costs of housing, but also high transportation costs, aging infrastructure that is expensive to both maintain and upgrade, and extraordinarily high energy costs. For these and a complexity of other reasons, housing options are limited and all housing is expensive across the Arctic Slope.

Housing provision in the North Slope Borough has been a significant issue since its formation in 1972. While the demographics of North Slope households have experienced dynamic change over the last 47 years, adequate housing has continued to be an underlying issue facing the borough and its residents. In every village across the North Slope, there are housing commonalities: the housing stock is generally older; housing options for residents outside of Utqiagvik have been generally limited to single-family homes; the availability of rental housing is extremely limited, especially in the villages; excessive overcrowding continues to overwhelm households.238 There have been strides in easing the housing burden. Homes owned outright have increased substantially and both the North Slope Borough and local housing authorities have had measured successful in addressing the issue by increasing housing opportunities.

Like many communities in rural Alaska and the North Slope, Kaktovik faces issues with older and deteriorating housing stock, overcrowding, an insufficient number of new homes, and exorbitantly high construction costs of both housing and infrastructure. Local governments and housing authorities need creativity to rehabilitate older homes and facilitate new housing construction. This chapter examines these issues in Kaktovik, focusing on both existing conditions and current and future housing needs.

The purpose of this Housing Chapter is to provide guidance and information important to residents, community and borough leadership, and other policy makers about the current and projected status of housing in Kaktovik.

9.1. Current Housing Conditions

Table 22 provides a snapshot of past and current housing characteristics in Kaktovik as reported by the North Slope Borough Economic Profile and Census Report over a sixteen-year period. Each of these items are discussed in more detail throughout this chapter.

Table 22: Housing Characteristics \(^{239, 240}\)

<table>
<thead>
<tr>
<th>Housing Characteristic</th>
<th>2003</th>
<th>2010</th>
<th>2015</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Total Population</td>
<td>286</td>
<td>100%</td>
<td>308</td>
<td>100%</td>
</tr>
<tr>
<td>Total number of housing units</td>
<td>59</td>
<td>100%</td>
<td>102</td>
<td>100%</td>
</tr>
<tr>
<td>Occupied housing units</td>
<td>94</td>
<td>100%</td>
<td>93</td>
<td>92.5%</td>
</tr>
<tr>
<td>Vacant housing units</td>
<td>0</td>
<td>0%</td>
<td>9</td>
<td>7.5%</td>
</tr>
<tr>
<td>Owner occupied homes (of occupied units)</td>
<td>23</td>
<td>35.3%</td>
<td>24</td>
<td>37%</td>
</tr>
<tr>
<td><strong>Renters</strong></td>
<td>42</td>
<td>64.6%</td>
<td>41</td>
<td>63%</td>
</tr>
<tr>
<td>Average number of people per household</td>
<td>3.32</td>
<td></td>
<td>3.44</td>
<td></td>
</tr>
<tr>
<td>Percent of overcrowding</td>
<td>n/a</td>
<td></td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Percent of severe overcrowding</td>
<td>n/a</td>
<td></td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

* Owner occupied homes and renter occupied homes include NSB census survey respondents only
** Includes senior 5-plex.
*** Includes Iñupiat households only.

Homes and Households.

The number of housing units in Kaktovik did not change significantly between 2010 and 2019. The 2010 NSB Census reported that there were 102 total housing units in Kaktovik and the 2015 NSB Census reported a total of 107 homes. However, in 2019, the total number of housing units returned to 102, indicating that there has not been a housing gain over last decade. In 2019, there were 95 single-family residential homes, one building for two families each (duplex); and one multi-family building with five units. The single duplex is privately-owned and the multi-family housing unit is a five-plex for seniors. Although there has not been an increase in the number of housing units since 2010, the 102 homes represents an increase of 43 total housing units since the 2003 NSBEP&CR.\(^{241}\)

Age and Condition of Housing.

According to NSB 2019 Census Report, the average home size in Kaktovik is the second smallest of all the North Slope villages, at 823.6 square feet.\(^{242}\) The NSB Assessor reports that Kaktovik residents have an average single-family home size of 1,093 square feet and duplex size of 1,162 square feet.\(^{243}\) While not the smallest average houses on the North Slope, homes in Kaktovik are smaller than the average housing size in Alaska and the U.S., which are 1,789 and 1,500 square feet respectively.\(^{244}\)

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\(^{240}\) North Slope Borough. 2020. NSB Assessor Data.


\(^{243}\) North Slope Borough. 2020. NSB Assessor Data.

The number of rooms, not including bathrooms, is 4.41.\textsuperscript{245}

The NSB Assessor also tracks the age of structures by community and type. The Assessor’s records indicate that the average age of single-family homes in Kaktovik is 35 years, duplexes is 19 years, and multi-family units is 11 years. Single-family homes make up 93 percent of the housing stock in Kaktovik, and nearly all of these homes are at least three decades old. Given the harsh Arctic conditions and a lack of both experienced tradespersons and readily available housing maintenance materials, many of the homes are overdue for renovations and weatherization upgrades.

According to the 2019 NSBEP&CR, 100 percent of homes in Kaktovik is heated with diesel oil, with the majority of homes using a baseboard boiler system (48 percent). Other sources of heating include stand-alone stoves (29 percent); stand-alone heaters (six percent); and forced air furnaces (14 percent). Every home (100 percent) in Kaktovik also has indoor plumbing and 94 percent of those homes are connected to the water and sewer system.\textsuperscript{246}

**Housing Occupancy.**

Although the number of housing units is the same in 2019 as in 2010, the vacancy rate has overall increased, from 7.5 percent in 2010 to 0 percent in 2015 to 23.5 percent in 2019. While the data indicates a high vacancy rate, residents have expressed that there is a severe lack of housing and that more homes need to be constructed or rehabilitated to ease the pressure.

\textsuperscript{245} North Slope Borough. 2020. *NSB Assessor Data.*

Home Ownership.
Kaktovik, of all the North Slope villages outside Utqiagvik, has the highest rate of renters and lowest proportion of homeowners with 36 percent of households renting their home. The 64 percent owner-occupied housing rate compares to 63.7 percent statewide, 60.1 percent in Anchorage, 57.1 percent in the North West Arctic Borough, and 60.6 percent in the Nome Census area.\(^{247}\)

Of the 50 households in Kaktovik that responded to the 2019 NSB Census survey question regarding home ownership, two were a TNHA rental, six were a NSB rental, one UIC rental, and nine other type(s) of rental(s), and one was through the TNHA Mutual Help program, four owned with mortgage/loan, one owned through a low-income program; and 26 owned outright.

Housing Affordability.
The U.S. Department of Housing and Urban Development (HUD) defines affordable housing as that which costs no more than 30 percent of the average household’s income.\(^{248}\) However, this definition is limited in some cases. High transportation costs to bring construction materials to Kaktovik with the inability of the market to construct homes anywhere near the cost to construct them, makes the measure of affordability largely unreliable in such a unique location.

The average household income in 2019 in Kaktovik was $65,995.\(^{249}\) Thirty percent of the average household income is $19,799, indicating that per the HUD definition of affordability, housing would need to cost less than $19,799 annually, or approximately $1,650 per month, for the average household in Kaktovik. The average cost for owner occupied housing was $460 and $676 for renters.\(^{250}\) These figures indicate that the majority of homeowners and renters in Kaktovik are not cost-burdened. However, in addition to mortgage or rental costs, Kaktovik residents also pay, on average, a monthly combined cost of $594 for heating, electricity, and water service, adding to the total cost of maintaining a home.

The most recent Alaska Construction Cost Survey was prepared in 2015 by the Alaska Housing Finance Corporation (AHFC). The survey collects contractor pricing for a market basket of materials (building supply, concrete, and shipping companies) determined by the design of a model home. The market basket represents approximately 30 percent of the materials used in the model home; however, it does not represent 30 percent of the total cost to build it.\(^{251}\) It allows comparisons across Alaska’s communities. The report reveals that Utqiagvik had the highest average cost for the market basket of goods of the sample Alaska cities, at $61,510, compared to Anchorage, the lowest, at $23,405 or 263 percent of the Anchorage cost. The market basket cost is also $11,631 more than the next most expensive community, Bethel. These figures require an added perspective: when one considers that Utqiagvik, as the North Slope hub community, is far less expensive than Kaktovik. Transport to Kaktovik would add substantial additional freight costs to the market basket price for Utqiagvik.

\(^{247}\) QuickFacts, July 2018 US Dept. of Commerce estimates based on US Census data
\(^{250}\) Ibid.
The availability of housing and the cost to construct new housing is an issue that significantly contributes to the lack of housing in Kaktovik. Overcrowding and severe overcrowding may be a larger issue than a household simply being cost-burdened; it is the lack of housing availability that most greatly affects the community.

**Overcrowding.**

HUD defines an overcrowded home as one in which more than one person per habitable room resides in the house and a severely overcrowded dwelling as one with one and a half or more people per habitable room.\(^{252}\)

Overcrowded and dilapidated housing has been a concern common in all North Slope villages during village comprehensive plan workshops held between 2014 and 2020. The recognition of this issue led the North Slope Borough Assembly to allocating significant capital funds to facilitate housing development during the CIP annual funding process. It has also led to the borough taking a more active role in housing in recent years, starting in 2011 with the formation of the Housing Solutions Group, a governmental division that was housed within the Mayor’s Office, to reestablishing the standalone Housing Department within the NSB government in 2018.

According to the AHFC 2018 Housing Assessment, approximately 6.3 percent or 16,110 of the 257,000 occupied homes in Alaska are overcrowded or severely overcrowded\(^{253}\) while the national housing overcrowding rate was 3.4 percent in 2017.\(^{254}\) The percentage of Alaska homes that are too small for the number of occupants is two times greater than the national rate. The highest rates of overcrowding are in rural areas where the population majority is Alaska Native, with nearly half of all households in some areas being overcrowded.\(^{255}\) The AHFC also estimated that the percent of Kaktovik households that were either overcrowded or severely overcrowded in 2018 was 4.2 times greater than the overcrowding rate for Alaska as a whole (6.4 percent) and 8.1 times greater than the national average.\(^{256}\)

The 2018 Housing Assessment estimated that 27 percent of all North Slope households live in overcrowded conditions: 15 percent of the population in the seven remote North Slope villages resided in overcrowded conditions and another 12 percent in severely overcrowded homes.\(^{257}\) This is essentially unchanged since 2014 when the AHFC Housing Assessment estimated that approximately 26 percent of North Slope households lived in overcrowded conditions: 14 percent were overcrowded and 12 percent were severely overcrowded.\(^{258}\) The 2019 NSB Census provides greater detail on overcrowding in each of the villages. It reports that in Kaktovik, eight percent of homes are considered overcrowded and 18 percent are severely overcrowded. All of the overcrowded and severely overcrowded homes are Iñupiat

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\(^{252}\) Habitable rooms are any spaces separated by a partial or complete wall, including kitchens, living rooms, dining rooms, bedrooms, etc., but not including bathrooms, porches, balconies, foyers, halls or unfinished basements.


households. This is consistent with the North Slope overcrowding rate overall, but higher than both state and national averages.

A 2014 unpublished white paper prepared by TNHA identified major housing issues facing North Slope communities. The paper further substantiates the dramatic housing need in Kaktovik; 63 families were living in overcrowded conditions with a shortage of 25 homes. While this paper analyzed conditions over six years ago, according to the 2019 NSB Census there has been no housing stock increase since 2010 and of the 102 housing units in Kaktovik, only five are reportedly less than ten years old.

Percentages of overcrowded and severely overcrowded homes are depicted in Figure 11.

**Homelessness.**

A 2017 national assessment by the Urban Institute for HUD that evaluated American Indian, Alaska Native, and Hawaiian housing needs found that overcrowding issues in Tribal areas are mostly due to households taking in family members who would otherwise be homeless. This is especially true in a region like the North Slope, where the cold climate necessitates housing community members that otherwise would be living on the streets. As the former President/CEO of the Bering Straits Regional Housing Authority, Christopher Klolerok, points out during a 2018 housing forum held in Savoonga “Rooted in a close-knit culture and deep familial links, many families prefer to house people in need, and live in severe overcrowding, rather than let individuals risk certain death if they are unsheltered... Overcrowded housing and the lack of housing are interchangeable conditions in rural Alaska. The lack of safe, sanitary and affordable housing threatens the survival of Native cultures and the villages and towns many Alaska Natives call home. For American Indians and Alaska Natives, overcrowded housing is a manifestation of what would be unsheltered homelessness in other parts of the country.” There is not available data on the rate of homelessness on the North Slope or in Kaktovik, but anecdotally, residents know that many would be homeless if not for the fellow residents that have taken them in.

**Land Availability and Infill Development.**

Most homes line First through Ninth streets. Within this developed area, there are approximately 18 lots available for residential infill. Several large tracts at the southern terminus of Kaktovik Avenue and along the

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eastern side of Hula Hula Avenue south of Ninth Street could also be subdivided for residential infill development. Map 11: Land Use depicts vacant lots within the community that could be developed for residential use. Because water and sewer lines already installed in this older part of Kaktovik, the cost savings to fully utilize these infill lots for additional housing rather than developing new lots is substantial.

The subdivision off Hula Hula Avenue is largely undeveloped, with approximately 127 lots available for new housing. For new development, this subdivision would require at least roads, power connections, and water and sewer service. Water and sewer systems are notoriously expensive to develop on the North Slope; in Kaktovik, extending piped water and sewer service with road and electric infrastructure would cost over $46 million. Truck haul water and sewer service is less expensive; developing road and electric infrastructure with truck haul service is estimated to cost nearly $16 million. Either of these also increases costs for operations, equipment, and expansion of water storage, sewer treatment, and power generation facilities.

Housing Activity.

There is not a housing development industry in Kaktovik as there are in most communities in the U.S. Without this industry, the NSB, the regional housing authority, the City and Native village of Kaktovik, and residents must navigate the path without private industry assistance.

Taigiugmiullu Nunamiullu Housing Authority

Housing authorities are independent agencies organized under state law to leverage funding from the HUD. HUD places certain guidelines on housing authorities’ operations. However, they have their own boards, managers, and often rules and guidelines. A housing authority’s day-to-day operations are overseen by an executive director.

TNHA is the regional housing authority for the North Slope. Six tribes have authorized TNHA to act on their behalf as their Tribally Designated Housing Entity (TDHE): the Native Village of Point Lay, the Native Village of Nuiqsut, the Naqsragmiut Tribal Council (Anaktuvuk Pass), the Native Village of Kaktovik, and the Native Village of Atqasuk. TNHA manages housing projects and block grant funding through the Native American Housing and Self-Determination Act (NAHASDA) and other federal and state programs. TNHA offers homeownership assistance that includes admissions and occupancy, counseling, inspections, and work order fulfillment.

TNHA was recently awarded a HUD grant to develop a Residents Opportunity for Self-Sufficiency (ROSS) program. This program will be administered by a service coordinator who will assist North Slope residents with coordinating access to employment and career development services, financial literacy and debt counseling, affordable childcare, and health and wellness services to increase household self-sufficiency.

263 Includes the westernmost block between Eighth and Ninth streets, Tenth, Eleventh, Twelfth streets and Nanook, Okpik, You Know, Gordon, and Atootchook avenues.
265 Includes escalation of 2% per year since 2014.
267 Includes escalation of 2% per year since 2014.
The program is scheduled to begin in the summer of 2020.268

To better match housing needs with its programs and improve its competitive edge in funding applications, TNHA is currently conducting a needs assessment. Replacing in-person community meetings with online meetings due to the COVID19 pandemic, TNHA is asking residents to provide feedback on the most critical housing issues in their communities. Through this input, TNHA plans to review its programs to ensure they align with community needs and make adjustments where necessary. TNHA is also looking to expand its services. One potential federal funding opportunity would facilitate constructing a duplex in Kaktovik as one more step in mitigating overcrowding in the community.269

TNHA and the Cold Climate Housing Research Center constructed five high-efficiency homes in Kaktovik designed specifically for arctic weather conditions. Homes were constructed a number of ways: using a foam foundation in lieu of a gravel or pile foundation with an exterior spray foam insulation; with a foam foundation and a timberwall exterior; or with portable and adjustable foundations and timberwall exteriors. All of the Kaktovik TNHA/CCHRC homes were also equipped with independent wastewater treatment systems to avoid the high cost of connecting to the piped utility system. While the independent systems undeniably provided a less expensive option for wastewater treatment, some residents and the NSB are concerned about the use of the independent wastewater treatment systems because they discharge effluent directly onto the tundra, often causing environmental issues like ponding on neighboring properties, odor, erosion, and permafrost thaw.270 TNHA is evaluating alternative wastewater strategies for its future developments.

North Slope Borough Housing Department.
The NSB Housing Department was created in 2018 to address critical housing needs across the Arctic Slope. The Housing Department is making significant strides in providing additional housing through construction and installation of modular home units, programs aimed at financial literacy, rehabilitating dilapidated housing. There are not any specific projects for new construction in Kaktovik.271 The NSB recently installed a modular building adjacent to the NSB Public Works building for itinerant housing, which eliminates

\[\text{268 Hagle, Griffin. Executive Director, TNHA. Personal communication.}\]
\[\text{269 Ibid.}\]
\[\text{270 Holmes, Travis, Principal Engineer UMIAQ Design. 2020. Personnel communication.}\]
\[\text{271 Robbins, David, Deputy Director North Slope Borough Housing Department. 2020. Personal communication.}\]
the need to utilize a single family home from within the community.

9.2. Current and Future Housing Needs

Kaktovik has ample vacant land for housing to meet the needs for the community. A community as small as Kaktovik still has households with a range of income. Housing opportunities need to reflect that starter homes, such as duplexes or triplexes, are needed as well as single-family homes for more established households. Development that makes use of existing infrastructure is important for affordability. New homes would need to connect to an expanded water and sewer system or truck haul service.

Because the population has decreased over the last decade, the rate of overcrowding has also declined. The 25 homes that TNHA were needed in 2014 has decreased to approximately 20 homes in 2020. If the population continues to contract, the community may not need additional homes in ten years. However, if the population rebounds even a half percent, 25 homes will be needed in ten years and additional four homes in twenty years.
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The natural environment is one of the Kaktovik’s greatest assets and greatly valued by its residents. Natural resource extraction within the North Slope Borough is already the primary contributor to the region and it may become a more direct and substantial contributor to Kaktovik community in the future. Yet large portions of land in the Kaktovik region are protected public lands. The small amount of privately-owned land in Kaktovik is primarily concentrated within and immediately surrounding the community and has already been developed, with the exception of KIC lands. This land use and land management chapter provides information on the multiple layers of land use and ownership in the community and the region as well as a discussions on local and regional issues concerning land management and future growth of the community.

Barter Island and the community of Kaktovik are located on the northern edge of the Arctic National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service. The community is one square mile (0.8 square miles of land and 0.2 square miles of water) while its Area of Influence is approximately 32,747 square miles, shown in Map 4.

### 10.1. Native Restricted Land

There are two types of protected (restricted) land for Native Alaskans: Native allotments and restricted townsite lots. Restricted land is inalienable; the property owner cannot lease, sell, or convey the land, or any inherited interest in the land, without first obtaining approval from the Bureau of Indian Affairs. Generally speaking, restricted land is also not subject to state or local laws, including taxation and land use regulations, such as zoning. Native restricted land will remain tax-exempt unless changed by the U.S. Congress or the restrictions are removed with the expressed approval by the BIA.273, 274

Generally, restricted lots were distributed via two federal statutes: the Alaska Native Allotment Act of 1906 and the 1926 Alaska Native Townsite Act. The Alaska Native Allotment Act of 1906 authorized the Secretary of the Interior to grant individual Alaska Natives ownership of up to 160 acres of vacant, non-mineral and unappropriated land if they could demonstrate past use. The majority of Native allotments are near villages and along rivers, streams, lakes, and coastal waters. There are 34 Native allotments within 50 miles of Kaktovik.275
Native allotments and camps and cabins in the vicinity of Kaktovik are shown in Map 9.\textsuperscript{276}

In 1971, a provision in the Alaska Native Claims Settlement Act repealed the authority to grant Native allotments, with the exception of applications that had already been submitted. Native allotment land is still being conveyed by the BLM; 16,000 parcels have been conveyed to Alaska Natives and there are approximately 251 remaining parcels to be processed.\textsuperscript{277} The Alaska Native Vietnam Veterans Allotment Act of 1998 authorized BLM to provide a new 18-month filing period to Alaska Native Vietnam-era veterans who were unable to file because of active duty service before the repeal of the Native Allotment Act of 1906. The Alaska Native Vietnam Era Veterans Land Allotment Section of the 2019 Dingell Act allows any Alaska Native Vietnam veteran who served between August 5, 1964 and December 31, 1971 and did not already receive a Native allotment to apply for up to 160 acres of land. This Act removed the requirement related to use and occupancy. The heirs of deceased eligible Alaska Natives can also apply.\textsuperscript{278} The BLM is currently developing rules to guide this renewed program.\textsuperscript{279}

The 1926 Alaska Native Townsite Act was passed by the U.S. Congress for the purpose of conveying public lands to Native Alaskans for homes within villages. All townsite acts were repealed by the passage of the Federal Land Use Policy and Management Act (FLPMA) in 1976 but lots that were already designed as Native restricted under the Townsite Act did not lose their status. Restricted deeds are managed for Native landowners by the federal government. The owners’ ability to sell or transfer the property is limited, but since federal law limits state and municipal jurisdiction over land uses on property held in trust by the U.S. government, restricted lots are not subject to NSB land use regulations nor are they subject to property tax or foreclosure. There are approximately 24 Native restricted properties in Kaktovik, all of which are bound by Pipsuk and Barter avenues and First and Eighth streets.\textsuperscript{280} Kaktovik townsite lots are identified in maps 10 and 11.

Native restricted land can become unrestricted. Once the restricted status is removed, the land can be taxed or sold without BIA approval or oversight. For example, if a restricted property is sold or willed to a non-Native, it will be conveyed to that person in an unrestricted status. Natives that chose to will a restricted property to a non-Native can opt to leave it as a life estate. The non-Native heir would use the property during his or her lifetime and when he/she passes away, the property is transferred to the second choice named in the owner’s will, thus potentially returning it to restricted status.\textsuperscript{281}

There are several land use concerns with Native restricted property. If a structure on a restricted property becomes a safety hazard for the community, local land use regulations cannot require that property owners mitigate the property to remove the risk. Another issue is fractionalization. Because some owners of restricted properties do not always have wills

\textsuperscript{276} North Slope Borough. 2020. NSB Assessor Data.
\textsuperscript{278} Ibid.
that specify beneficiaries, heirs in common inherit the land, often for several generations. Some property may have multiple owners and with each passing generation, the portions of property interest become smaller and smaller, causing the property to become fractionalized. Even without probate issues, it may be difficult to reach a consensus amongst multiple property owners, a status which often jeopardizes the usefulness of a property.

10.2. Alaska Native Claims Settlement Act

ANCSA was passed in 1971. This Act was intended to settle outstanding Native Alaskan land claims and establish clear title to Alaska's land and resources. ANCSA recognized the rights of Alaska Natives to a small portion of the lands they have traditionally occupied for thousands of years through land distribution to regional and village Native corporations. The Native village corporations received title to the surface estate in and around villages.

Kaktovik Iñupiat Corporation.

In total, KIC has selected and received 89,878.64 acres of surface estate in and around the community through the ANCSA Section 12(a) entitlement. Section 12(a) entitles village corporations to select all of the township in which any part of the village is located, plus an area that will make the total selection equal to the acreage to which the village is entitled. No corporation is allowed more than 69,120 acres from the National Wildlife Refuge System. Because KIC's lands are within the original boundaries of ANWR, they are subject to ANCSA Section 22(g) which states that refuge lands conveyed to Native corporations are subject to the laws and regulations governing the use and development of that refuge. The remaining KIC 12(a) entitlement is 2,281.36 acres that have not yet been conveyed. There was not a 12(b) entitlement for Kaktovik. The 12(b) entitlement is land distribution from the regional corporation to village corporations after considering historic use, subsistence needs, and population. Under ANCSA Section 14(c)(3), a village corporation must convey to a municipal corporation (city), or the state in trust (where an incorporated city does not exist, such as Point Lay), lands identified for present and future community needs, such as community expansion, rights-of-way, and other community needs. The 14(c) process is complete for Kaktovik; there are not any additional lands to be conveyed from KIC to the city for municipal purposes.

ANCSA also established 17(b) easements, which are easements reserved to the U.S. and located between communities, airports, docks, and marine coastline. They take the form of 60-foot wide roads, 25- and 50-foot trails, and one-acre sites for short-term uses. There are not 17(b) easements across public lands. The purpose of most 17(b) easements is to allow the public to cross private property to reach public lands and...
major waterways. Hunting, fishing, or other recreational activities are not allowed on 17(b) easements because the land is privately owned. There are a number of 17(b) easement trails near Kaktovik, as shown in Map 7.

10.3. Land Ownership and Management

North Slope Borough.
The NSB owns land in Kaktovik associated with its public works facilities. These facilities include the airport, landfill and sewage lagoon, wastewater treatment plant, water treatment facility, power plant, shop facilities, school, health clinic, fire station, power generation, water and sewer systems, and the public works building(s).

State of Alaska.
The State of Alaska owns lands and waters within the NSB, including submerged lands. The federal Submerged Lands Act of 1953 recognizes title by states to the submerged, navigable lands within their boundaries at the time of statehood. These lands include onshore navigable waterways and offshore marine waters extending three nautical miles seaward from the coast.

The State of Alaska owns most of the area between the National Petroleum Reserve—Alaska (NPR-A) and ANWR, including the Prudhoe Bay and the Kuparuk oil and gas fields. The Alaska Department of Natural Resources (DNR) is in the process of developing the North Slope Area Plan that seeks to establish a balanced combination of land for public and private uses. While the Planning Area is primarily the along the Dalton Corridor and in Prudhoe Bay, the Brooks Range foothills, and Chandalar, the draft plan also includes in its Planning Area the Arctic Tidelands from Icy Cape to the Canadian border. Kaktovik is within the Kaktovik Tidelands designation; the intent of this unit is to “maintain opportunities for subsistence…” and “due to the small size of this unit and potential for community needs, oil and gas development should not be authorized.” The Central Beaufort Sea Coast Unit that is proposed to be “primarily managed for wildlife habitat values and harvest opportunities…” and that “oil and gas leasing/development may occur but must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, and mitigate any potential negative effects.”

West of the Kaktovik Tidelands is the Central Beaufort Sea Coast Unit that is proposed to be “primarily managed for wildlife habitat values and harvest opportunities…” and that “oil and gas leasing/development may occur but must also consider potential impacts on the habitat and harvest values and include general mitigation measures that will avoid, minimize, and mitigate any potential negative effects.”

Federal Lands.
The federal government owns over half of the land within the North Slope Borough. Federal land in the North Slope Borough include: Arctic National Wildlife Refuge, National Petroleum Reserve—Alaska, portions of the Gates of the Arctic National Park (GARR), the Noatak National Preserve, the Alaska Maritime National Wildlife Refuge, and federal waters of the Outer Continental Shelf (OCS). ANWR is the only federal land holding that substantially affects Kaktovik residents.

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290 Ibid.
291 Ibid.
**U.S. Air Force.**

The U.S. Air Force has occupied portions of Barter Island since 1947. In 1951, Public Land Order No. 715 reserved about 8,900 acres on Barter Island as public land for the use by the U.S. Air Force to establish the Barter Island Distant Early Warning Line Station. The station was part of a series of radar facilities built along the Arctic coast to detect incoming Soviet bombers. All but about 615 acres of the original withdrawal have been relinquished by the Department of Defense. Currently, the U.S. Department of Defense owns the land where the former airport was located and the DEW Line Station.

**U.S. Fish & Wildlife Service.**

The village of Kaktovik and much of its Area of Influence lies within the boundary 19.3 million-acre Arctic National Wildlife Refuge, the largest national wildlife refuge. ANWR is managed by USFWS as part of the National Wildlife Refuge System. The refuge extends from the Canadian border east along the northern coast westward to Point Thomson and turns south for approximately 200 miles across the coastal plain through the Brooks Range and into the spruce and birch boreal forests of the Yukon River basin.

Beyond the Brooks Range, ANWR is within the Yukon-Koyukuk census area and part of the unorganized borough. ANWR makes up nearly a third of the NSB’s 94,796 square miles.

ANWR is comprised of three areas: 1002 Area along the Beaufort Sea coast, often known as the Coastal plain (1.5 million acres); the Wilderness Area directly south of the 1002 Area (8 million acres); and the remainder of the refuge (9.8 million acres). These three areas make up an area the size of South Carolina. There are no roads, marked trails, or campgrounds within ANWR.

ANWR is managed under a Minimal Management classification intended to maintain existing natural conditions and resource values. ANWR is available for public use for subsistence and for a variety of activities such as hunting, fishing, trapping, backpacking, river floating, and camping. Traditional motorized access using aircraft, motorboats, and snowmachines is allowed. Guiding and outfitting services and related temporary support facilities are permitted. The USFWS focuses its efforts primarily on maintaining natural conditions and

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292 As a result of the U.S. Supreme Court case known as the Dinkum Sands case, the federal government retained ownership of coastal waters within the boundary of ANWR, including the lagoon adjacent to the community (521 U.S. 1 (1997)).
on conducting studies and survey/inventory programs to increase the ANWR’s resource database and evaluate public use levels and impacts.293

**Arctic National Wildlife Range.**
The 8.9-million acre Arctic National Wildlife Range was established in 1960 to preserve unique wildlife, wilderness, and recreational values of the pristine and remote landscape.

**Alaska National Interest Lands Conservation Act Additions.**
The Alaska National Interest Lands Conservation Act (ANILCA) was enacted in December 1980. It designated 100 million acres of land in Alaska as national park, preserve, wildlife refuge, wilderness area, and wild and scenic rivers. Notably, ANILCA identified the importance of subsistence use in ANWR; the four primary purposes provided in ANILCA to guide ANWR management is a) to conserve fish and wildlife populations and habitats in their natural diversity; b) to fulfill the international fish and wildlife treaty obligations of the U.S.; c) to provide the opportunity for continued subsistence uses by local residents; and d) to ensure water quality and necessary water quantity within the refuge.294

ANILCA re-designated the Arctic National Wildlife Range as part of the larger Arctic National Wildlife Refuge, expanded the protected area south and west by 9.2 million acres, and renamed it.295, 296 ANCILA also allowed KIC to relinquish its selected lands outside ANWR and instead select lands within the Refuge. Section 1003 of ANILCA states that the “production of oil and gas from the Arctic National Wildlife Refuge is prohibited and no leasing or other development leading to production of oil and gas from the [Refuge] shall be undertaken until authorized by an act of Congress.”297

**1002 Area.**
ANCILA also stipulated that the 1002 coastal plain not be included in the wilderness designation.298 Congress postponed development and protection decisions of the coastal plain because of the area’s potentially enormous oil and gas resources and its important wildlife values. ANCILA Section 1002 directed biological and geological studies of the coastal plain, including an inventory and assessment of fish and wildlife resources, an analysis of potential impacts of oil and gas exploration and development on those resources, and a delineation of the extent and amount of potential petroleum resources.

The 1987 Final Legislative Environmental Impact Statement (FLEIS) noted that the coastal plain had outstanding wilderness qualities as well as large hydrocarbon resources. The FLEIS recommended making the coastal plain available for oil and gas leasing.299 It was estimated to contain more than nine billion barrels of

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recoverable oil, an amount approximately equal to Prudhoe Bay.  

No action was taken over the next thirty years, first due to low oil prices and then an inability to pass legislation at the federal level.

**Tax Cuts and Jobs Act of 2017.**

The Tax Cuts and Jobs Act directed the Secretary of the Interior to establish two area-wide leasing sales, not less than 400,000 acres each along the coastal plain of ANWR. It also authorizes up to 2,000 acres, or 0.01 percent of ANWR’s 19.3 million acres, for surface facilities. One of the requirements in the Act is that a lease sale of not less than 400,000 acres be held within the first four years of enactment and a subsequent lease sale within seven years.

Development proponents view the 1002 Area as a promising onshore oil prospect. According to the U.S. Geological Survey (USGS), the mean estimate of technically recoverable oil from multiple prospects on the federally owned land is 7.7 billion barrels; there is a low probability that more than 11.8 billion barrels could be recovered on the federal lands over the life of the prospective fields.

The EIS for the Coastal Plain Oil and Gas Leasing Program considers a range of alternatives to meet the Act’s energy leasing provisions. The EIS analyzes the potential environmental impacts of leasing alternatives and the terms and conditions to be applied to leases and associated oil and gas activities while limiting the footprint of production and support facilities on federal lands to no more than 2,000 acres. The EIS only authorizes a lease sale. Any applications for future exploration and development activities would require a separate analysis.

In anticipation of exploration and development activities in the 1002 Area, Kaktovik Iñupiat Corporation requested authorization to conduct winter seismic activities on the eastside of the Coastal Plain for the winter 2020-21 season. Seismic exploration generates acoustic waves that are picked up by sensors as the waves bounce off subsurface formations. From this information, images can be created that show subsurface topography and formations including...
those areas of potential hydrocarbons. KIC’s proposed seismic program for 2020-21 was canceled because the USFWS did not issue incidental harassment authorization. This permit would have allowed seismic operations near polar bears. However, KIC missed a deadline to conduct required aerial polar bear den-detection work.

Map 8: BLM Coastal Plain 2021 Lease Sale Results

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10.4. Resource Exploration and Development

Oil exploration and development in the 1002 Area is a contentious issue, debated at the local, regional, state, and national levels. Kaktovik residents are divided on the issue. A 2019 poll of 93 residents by the City of Kaktovik confirms the divide: 52 percent of resident respondents support or somewhat support opening the coastal plan to oil exploration and development, 32 percent are somewhat against or oppose it; and the remaining 16 percent are neutral. Besides coastal plain resource exploration and extraction, Kaktovik residents overall do not support drilling offshore (84 percent against), seismic activity on the mainland (52 percent against); or seismic activity offshore (76 percent against).\(^{312}\) Whether for or against development, residents are concerned about its effects on the water, the land, and subsistence resources in the region.\(^{313}\)

Kaktovik residents in favor of 1002 Area oil exploration and development see the benefits development has brought to borough communities, including public infrastructure funded by the North Slope Borough, in part through property taxes levied on oil companies. ASRC dividends from subsurface rights also provides income to its shareholders. Proponents maintain that oil development provides the financial resources that are needed to allow the Iñupiat people to continue to live in the Arctic and teach future generations how to subsist off the land.\(^{314}\) Some residents have expressed concern about becoming ‘conservation refugees’; that is, being so confined by federal restrictions that they are left without an economy or employment opportunities for the people of Kaktovik.\(^{315}\)

Other residents oppose development to protect the water, land, and food from development and an overdependence on the oil economy. Some are concerned that natural resource development will threaten their ability to hunt and gather food on traditional lands, displace migrating caribou; and negatively affect wildlife.\(^{316}\)

10.5. Zoning and Land Use Regulations

A major component of local planning is zoning, the division of areas into land use districts and the regulation of lands within those districts. Zones are designed to accommodate current and potential uses on both public and private land. Detailed regulations guide how each district can be used. The NSB is charged by the State of Alaska with administering plating and zoning on behalf of its residents. Through Title 19 the borough exercises its zoning and land use authority. All areas within the borough have been assigned to a zoning district, as depicted on the official zoning map. In addition to several districts that apply only to Utqiagvik, there are five zoning districts: Village, Conservation, Scientific Research, Resource Development, and Transportation Corridor. The Assembly must approve any zoning changes after review by the NSB Planning Commission.

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The entirety of the city of Kaktovik is contained within the Village District. The surrounding area outside of the municipal boundaries is within the Conservation District. Table 23 describes uses that are allowed in these two districts.317

Chapter 19.40 describes the purpose of each zoning district and which activities require an administrative approval, a development permit, or a conditional development.318 In addition to policies related to individual districts, Title 19 requires projects to be evaluated by additional policies, including Economic Development Policies (§ 19.70.030), Offshore Development Policies (§ 19.70.040), Coastal Management Policies (§ 19.70.050), and Transportation Corridor Policies (§ 19.70.050). The NSB’s Coastal Management Policies remain in effect under the NSBMC even though the statewide program has ended. Provisions in Title 19 address implementation enforcement related to traditional land uses as well. There may be additional state and federal requirements for proposed projects. NSB land use regulations do not apply to Native restricted properties.

A consideration at the North Slope Borough Planning & Community Services Department is to create village zoning commissions, similar to the Utqiagvik Zoning Commission, whose purpose is to “implement the Comprehensive Development Plan for Utqiagvik and aid in fire prevention and the delivery of emergency medical services.”319 If the community is interested in implementing such a commission, there would need to be significant coordination between the community leadership and the North Slope Borough.


All areas within the Kaktovik city limits are zoned as a Village District, and the remainder of Barter Island is located within the Conservation District. The Village District is described in the NSBMC Title 19 (§ 19.40.060). The intent of the Village District is to accommodate uses which:

- Reinforce traditional values and lifestyles;
- Are in accord with the North Slope Borough Comprehensive Plan, Capital Improvements Program and Comprehensive Development Plan for the village; and
- Are in accord with the desires of the residents of the village.

Although Kaktovik is within the Village District, Native restricted properties are not subject to the NSB’s zoning regulations. Because there are Native restricted properties within the Kaktovik townsite, adopting new zoning regulations may not have a substantial effect on regulating land use activities or directing future growth in a specific area or areas where there are already existing Native restricted properties. The land uses that are permitted in the Village District include:

For Administrative Approval. The following can be administratively approved by the borough’s Land Administrator320 without public notice:

1. placement of fill in a wetland in accordance with the Army Corps of Engineers general permit.

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317 The Village District is described in the NSB Zoning Regulations Section 19.40.060, and the Conservation District is described in Section 19.40.70.
318 Activities listed as a conditional development require approval by the NSB Planning Commission.
320 The Land Administrator for the Borough is the Director of the NSB Planning and Community Services Department.
For a Development Permit. The following may be permitted upon approval by the Land Administrator after public review:

1. Public facilities;
2. Commercial development; and
3. Any use or structure within the watershed that provides the community’s drinking water.

For a Conditional Use Permit. The following are conditional and may be established upon approval of the NSB Planning Commission:

1. Resource extraction; and
2. Any use “elevated” by the Land Administrator for Commission review by the NSB Land Administrator, pursuant to § 19.50.020.321

Also within Title 19 (§19.70.020) are Village Policies that are intended to guide the approval of development and uses in the Village District:

A. Development and uses will not be allowed which grossly violate guidelines on the rate or amount of growth adopted by a village as a part of its Comprehensive Development Plan;

B. Development and uses in a village are required to be consistent with the relevant adopted village Comprehensive Development Plan;

C. Development and uses are encouraged which provide or materially contribute to lower-cost fuel or power; and

D. Development and uses are encouraged which provide local employment in the villages.

Conservation Zoning District (§ 19.40.070). This district generally encompasses the undeveloped areas of the borough and is intended to conserve the natural ecosystem for all the various plants and animals upon which borough residents depend for subsistence. Subject to this overall intent, land within this district be used for limited resource exploration and development.322 Major resource development project areas must be rezoned to the Resource Development District (RDD). In Kaktovik, the Conservation District includes the airport, DEW Line facilities, the landfill, and undeveloped areas of the island and beyond. The DEW Line facilities were developed prior to the adoption of the first NSB zoning regulations in 1984 and are legal nonconforming uses allowable under Title 19. Land uses permitted within a Conservation District include:

For Administrative Approval. The following can be administratively approved by the NSB Land Administrator without public notice:

1. Temporary use (including fuel storage) of existing gravel airstrips in support of pre-exploration activities;
2. Archaeological surveys;
3. Tundra travel; and
4. Minor alterations to existing development.

For a Development Permit. The following may be permitted upon approval by the Land Administrator after public review:

1. Commercial recreation;
2. Ice roads and ice pads;
3. Exploration, prospecting or limited development in anticipation of resource extraction; and

321 Under NSBMC § 19.50.020, the Land Administrator (Planning Director) may elevate an administrative approval or a development permit decision to that of a conditional use process and the permit application for a Point Hope proposal would then be considered for approval by the NSB Planning Commission. Based on written findings that the elevation decision satisfied specific criteria notes in Title 19.

4. Offshore development in compliance with the policies of § 19.70.040.

*For a Conditional Permit.* The following may be established upon approval of the Planning Commission:

1. All conditional and other development permit applications elevated by the Land Administrator under § 19.50.020.

### Table 23: Uses Allowed in the Village and Conservation Districts by Permit Type

<table>
<thead>
<tr>
<th>Village District (§19.070.020)</th>
<th>Conservation District (§19.70.070)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative Approval</strong></td>
<td><strong>Development Permit</strong></td>
</tr>
<tr>
<td>Placement of fill in accordance an Army Corps of Engineers general permit.</td>
<td>Public facilities, commercial development and any use or structure within the watershed for the community’s drinking water.</td>
</tr>
<tr>
<td><strong>Administrative Approval</strong></td>
<td><strong>Development Permit</strong></td>
</tr>
</tbody>
</table>
| 1. Temporary use (including fuel storage) of existing gravel airstrips in support of pre-exploration activities  
2. Archeological surveys  
3. Tundra travel  
4. Minor alterations to existing development | 1. Commercial recreation  
2. Ice roads and ice pads  
3. Exploration, prospecting or limited development in anticipation of resource extraction; and  
4. Offshore development in compliance with the policies of §19.70.040 | All development elevated by the Land Administrator under §19.50.020 |

### 10.6. Current Land Use

Kaktovik residents live in an area on Barter Island of one square mile. The community was built using a grid system with the main streets of Barter Avenue, Kaktovik Avenue, Pipsuk Street, and Hula Hula Avenue running in a generally north-south orientation, as shown in Map 13: Community Facilities. Typical residential lots are nearly a quarter in size about 100 by 100 feet. Each block has an unimproved 20 foot utility easement (10 feet in each of abutting lots) and streets generally have a 60-foot right-of-way.

Most residential uses are located west of the Kaktovik Lagoon in the center of the community with a large and primarily undeveloped...
residential subdivision located south of the community center off Hula Hula Avenue as it heads to the airport. Government offices and public facilities are primarily located in the northwest portion of the community with the wastewater treatment plant and the airport located south and southwest of the community center, respectively. Map 11 shows the zoning district limits, the same as the municipal boundary.

Identifying land by the type of use is common in current and long range planning. Map 11 illustrates current land use. These land uses are not delineated in NSBMC Title 19 but are included here to distinguish certain areas within the community. General categories of current land uses are provided in Table 24.

Table 24: Current Land Uses

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Single-family and multi-unit housing</td>
</tr>
<tr>
<td>Commercial</td>
<td>Grocery stores, repair shops, hotels, bed &amp; breakfast establishments, fuel distribution centers, churches, bingo halls, recreation facilities, senior and youth centers, daycare centers and other public services</td>
</tr>
<tr>
<td>Industrial</td>
<td>Public facilities such as public works shops, water and sewage treatment plants, telecommunications facilities, warehouse and storage yards, the airport, cemetery, gravel pits, fuel tank farms, landfills, resource development areas, and similar uses</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>Residential uses and small-scale commercial uses that are compatible with residential areas, such as small grocery stores, day care facilities, post office yet exclude industrial and resource development uses</td>
</tr>
</tbody>
</table>

10.7. Future Land Use

There are sufficient number of parcels already available for future housing development, primarily in the subdivision near Hula Hula Avenue and also through infill in existing parcels. There is also sufficient land within the community to accommodate expansion for increased infrastructure capacity, should that be needed in the future. The current capacity of community facilities, as discussed in Chapter 7, is sufficient for the planning horizon of this plan. The community has sought a road around the island that connects to the mainland. This would facilitate greater subsistence access to areas beyond the island. Residents have also expressed interest in a road that connects Kaktovik to the Alaska road network. This road would allow materials and supplies to be delivered to Kaktovik overland with substantial savings in the cost of shipping via barge or air. These roads are depicted in maps 15 and 16.
1, Boat Launch
2, NSB Waste Water Treatment Plant
3, Cemetery
4, Marsh Creek Inn
5, KIC Office
6, Native Village of Kaktovik Office
7, ANWR Office
8, NSB Police Housing
9, Assembly of God Church
10, Senior Housing
11, Grave Sites
12, Ice Cellar
13, Grave Sites
14, Kavvik Den
15, Kaktovik Store
16, Qargi Community Center
17, Police Department
18, NSB RELI Shop / NSB Warm Storage
19, Fire Station
20, Health Clinic
21, Teleconference Center
22, Water Treatment Facility
23, NSB Power Plant
24, NSB Shop
25, ASTAC
26, Water Storage
27, Teacher Housing
28, Harold Kaveolook School
29, Waste Heat
30, US Post Office
31, Sims Bunk House
32, Sims Store
33, NSB Vacuum Lift Station
34, Ice Cellar
35, Kaktovik Presbyterian Church
36, Waldo Arms Hotel
37, KIC Fuel Office
38, KIC Shop / Garage
39, Bulk Fuel Tank Farm
40, Ice Cellar
41, Whaling Shack
42, Boat Storage
43, Dept.of Defense Barter Island DEW Line Station
44, Interim School

Community Facilities
Map 13
10.8. Contaminated Sites

Contaminated sites are locations where hazardous substances, including petroleum products, have been improperly disposed. There are 24 contaminated sites identified by the Alaska Department of Environmental Conservation in and around the village of Kaktovik. Each one is assigned one of several clean-up statuses: cleanup complete, cleanup complete – institutional controls, active, and informational. Fourteen have a cleanup complete status and five a cleanup complete – institutional controls status. The remaining are active.

All sites on Barter Island are listed in Table 25 along with some accompanying background and location information. They are also illustrated geographically on Map 14. More in depth information regarding contaminated sites within or near Kaktovik, including up to date site status details, a cleanup chronology, and other associated documents can be found on the Alaska Department of Environmental Conservation Contaminated Sites Program website.

Active Sites.
Sites assigned an active status have not yet met adequate cleanup levels for contamination. Active cleanup sites pose a particular threat to environmental well-being because contaminants have the potential to become exposed to or seep in to surrounding soil as well as ground or drinking water posing obvious concerns to surrounding plant, animal, and human health. Of greater concern is the fact that of the five active sites in the Kaktovik area, two are less than one mile from Harold Kaveolook Schoolsite and within the village limits. Some landfills accept contaminated waste depending on what contaminates are in the soil.

All active sites in Kaktovik have some level of petroleum contamination, diesel, gasoline, and/or residual range organics as well as other contaminants. Some sites carry possible lead and/or polychlorinated biphenyl (PCB) contamination. Most are due to prior leaks or spills originating from above ground tanks or pipelines, with some being associated with the prior presence of the U.S. military.

The active contamination site closest to the school is currently being monitored bi-annually for surface water sheen. Prior site characterization efforts report levels below Alaska Department of Environmental Conservation Arctic Zone cleanup levels but above the most stringent cleanup levels set by the Department. Preparation for more extensive characterization of the site by the borough is planned, pending budget approval. The second site, just north of the school, power plant, and most of the village residential area, presents some drainage concerns. Stormwater from the site naturally drains into a nearby lagoon. This drainage route, however, cuts through a residential area, creating health concerns to residents and local flora and fauna in and around the area.
Cleanup Complete – Institutional Controls Sites.
Four sites have a Cleanup Complete – Institutional Controls status. These sites are defined by ADEC as having a non-engineered institutional control, often in the form of “documentation that informs people about contamination that is present on a specific piece of property and limits activities that could result in exposure to or the spread of the contamination.” All Institutional Controls sites located in the Kaktovik area are associated with the prior operation of the Barter Island DEW Line Radar Station by the U.S. military. The Barter Island DEW Line has been inactive since 1990. All these sites are located in a cluster formation in the northwest corner of the village.

Cleanup Complete Sites.
Sites designated Cleanup Complete by ADEC constitute the majority in the Kaktovik area. Of these sites, nine of the 14 are associated with the U.S. military’s prior operations of the DEW line, mentioned above. A handful of these sites are located on the outskirts of the village but the majority are clustered in the northwest corner of the village intermixed among the Institutional Controls sites. A few are near the Barter Island Long Range Radar Station Airport and two are located in the heart of the village. One site is near Manning Point. These sites have met ADEC mandated cleanup levels following site characterization and cleanup efforts and have been cleared for residential land use.

Although ADEC records indicate that the cleanup for Site 761 on the eastern edge of the spit is complete, residents report having seen rusty metal scraps in the water and along the coastline as well as floating Kevlar in the Kaktovik Lagoon that was place along the runway as an erosion control measure.

Table 25: Contaminated Sites on Barter Island

<table>
<thead>
<tr>
<th>ADEC ID</th>
<th>Site Name</th>
<th>Location</th>
<th>Status</th>
<th>ADEC File #</th>
</tr>
</thead>
<tbody>
<tr>
<td>739</td>
<td>South Barter Island Barrel Dump</td>
<td>South Barter Island</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>752</td>
<td>Barter Island DEW - POL Catchment</td>
<td>LF003 catchment for, the POL tanks on base</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>753</td>
<td>Barter Island DEW - Old Dump Site (LF019)</td>
<td>LF019 by snow fence, NE of contaminated ditch</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>754</td>
<td>Barter Island DEW - Heated Storage (SS013)</td>
<td>Barter Island</td>
<td>Cleanup Complete - Institutional Controls</td>
<td>350.38.001</td>
</tr>
<tr>
<td>755</td>
<td>Barter Island DEW - Garage (SS014)</td>
<td>East of Powerhouse, North of Heated Storage Building</td>
<td>Cleanup Complete - Institutional Controls</td>
<td>350.38.001</td>
</tr>
<tr>
<td>756</td>
<td>Barter Island DEW - Weather Stat</td>
<td>Barter Island</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
</tbody>
</table>

329 Ibid.
<table>
<thead>
<tr>
<th>ADEC ID</th>
<th>Site Name</th>
<th>Location</th>
<th>Status</th>
<th>ADEC File #</th>
</tr>
</thead>
<tbody>
<tr>
<td>757</td>
<td>Barter Island DEW - POL Tanks</td>
<td>SS017 on main part of the installation</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>759</td>
<td>Barter Island DEW - JP-4 Spill</td>
<td>Adjacent to city tank farm, East of main dew toward runway</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>760</td>
<td>Barter Island DEW - Old Landfill</td>
<td>Landfill LF001</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>761</td>
<td>Barter Island DEW - Runway Dump</td>
<td>LF012 at the end of the, runway in flood area</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>801</td>
<td>Barter Island DEW - Contamination Ditch (SD008)</td>
<td>IRP Site SD08, Runs to Ocean on North East</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>1431</td>
<td>Waldo Arms Fuel</td>
<td>Kaktovik Airport, Northwest end of Airstrip next to hangar</td>
<td>Cleanup Complete</td>
<td>350.38.004</td>
</tr>
<tr>
<td>1921</td>
<td>Kaktovik Kaveolook School</td>
<td>2001 Barter Avenue</td>
<td>Cleanup Complete</td>
<td>350.38.007</td>
</tr>
<tr>
<td>2306</td>
<td>NSB Kaktovik Power Plant Tank Farm</td>
<td>Near Village School</td>
<td>Active</td>
<td>350.38.006</td>
</tr>
<tr>
<td>2307</td>
<td>NSB Kaktovik Tank Farm Terminal</td>
<td>North of Town, Near Airstrip</td>
<td>Active</td>
<td>350.38.005</td>
</tr>
<tr>
<td>2327</td>
<td>NSB Kaktovik KIC Pad</td>
<td>North of Village School</td>
<td>Active</td>
<td>350.38.002</td>
</tr>
<tr>
<td>3085</td>
<td>Barter Island - Staging Area</td>
<td>1.5 Miles South of Kaktovik, near Kaktovik Lagoon</td>
<td>Cleanup Complete</td>
<td>350.38.003</td>
</tr>
<tr>
<td>4036</td>
<td>Barter Island DEW - Air Terminal</td>
<td>On the Runway, Adjacent to Hangar</td>
<td>Cleanup Complete - Institutional Controls</td>
<td>350.38.001</td>
</tr>
<tr>
<td>4037</td>
<td>Barter Island DEW - Fuel Tanks</td>
<td>On Road to Installation, Across from Containment Ditch</td>
<td>Cleanup Complete - Institutional Controls</td>
<td>350.38.001</td>
</tr>
<tr>
<td>4038</td>
<td>Barter Island DEW - Dump Area NW</td>
<td>North of Freshwater Pond, on the Coast</td>
<td>Cleanup Complete</td>
<td>350.38.001</td>
</tr>
<tr>
<td>4222</td>
<td>Barter Island LRRS Refueling Area</td>
<td>West of Hangar, Barter Island Runway</td>
<td>Cleanup Complete</td>
<td>350.38.009</td>
</tr>
<tr>
<td>4229</td>
<td>Barter Island LRRS Hangar</td>
<td>Hangar, Barter Island Runway, North Side of Runway</td>
<td>Active</td>
<td>350.38.008</td>
</tr>
<tr>
<td>26827</td>
<td>NSB Kaktovik Transformer</td>
<td>~60 Feet West of NSB Kaktovik Tank Farm Terminal</td>
<td>Active</td>
<td>350.38.013</td>
</tr>
</tbody>
</table>
Data Sources:
Alaska Dept. of Environmental Controls
Division of Spill Prevention and Response

Cleanup Complete
Cleanup Complete - Institutional Controls
Informational
Open
Data Sources: North Slope Borough

Note:
For Land Use Classification see mapXX

Future Land Use
Map 15

Proposed Future Roads
Regional Future Land Use
Map 16

- Data Sources:
  - Alaska Department of Natural Resources
    - Land Records Information Section
  - North Slope Borough
  - Alaska DNR Division of Oil and Gas

- Proposed Future Roads
- North Slope Borough Boundary

NORTH SLOPE BOROUGH

Deadhorse

Kaktovik

Chukchi Sea

CHAPTER 10: LAND USE & ZONING
KAKTOVIK COMPREHENSIVE PLAN
2021 – 2041
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Appendices

Appendix A: State of Alaska Community Profile Maps
Appendix B: Adaptation Strategies for Climate Change Impacts
Appendix C: Response to Public Review Comments
Appendix D: Resolutions of Plan Support
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## Appendix B: Adaptation Strategies for Climate Change Impacts

<table>
<thead>
<tr>
<th>Weather-related physical change</th>
<th>Potential impacts to the village</th>
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<tbody>
<tr>
<td>Warmer weather causes thinner lake, river and sea ice. Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition. Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies. 331</td>
<td>Flooding or damage to ice cellars result in food contamination and food insecurity. This forces families to eat non-traditional and less healthy/nutritious packaged “store bought” food flown in at great expense. Hunters would have to spend greater financial resources and more time, encompassing greater hazards, to find riverine and terrestrial species—beyond the 10 to 15 miles ideal distance—and into unsafe sea ice conditions. Unknown ice thickness creates hazards for hunters and other winter travelers on snow machines. Traditional knowledge cannot be relied upon as the thinner ice conditions change seasonally and can be exacerbated yearly. Warmer water in lakes and streams cause fish to die in nets, fish texture “softer” and drying of fish is more difficult.</td>
<td>Each village establishes a communication system with residents traveling to hunt, fish and gather foods and travelers on the ice are required to carry emergency GPS tracking devices. Village Search &amp; Rescue teams are properly equipped to rescue travelers in trouble. Permit stipulations for Oil &amp;Gas or commercial tourism travel could require a subsistence mitigation fund which would provide funds to hunters to cover the costs to purchase adequate boats, fuel and equipment to find and harvest subsistence resources at the greater distance from their traditional migratory routes. Aerial “flyovers” of traditional routes with specialized equipment to measure the depth of ice and then posting and advertising to the village the safest route to take on the ice for hunting expeditions and for traveling to common destinations such as the nearby village.</td>
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<tr>
<td>Warmer weather causes thinner lake, river and sea ice.</td>
<td>Fresh water drains downward—loss of drinking water supply.</td>
<td>A village-specific adaptation plan would identify specific hazards associated with the thawing of permafrost in and near the village and would identify options for remedying impacts or avoiding these hazards. It would identify options and the costs and benefits of each option. It is noted that all fresh water lakes in the region are underlain by permafrost and, therefore all freshwater drinking supplies are vulnerable/susceptible to the draining of water and the release of methane.</td>
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<tr>
<td>Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition.</td>
<td>Village water lines break, causing loss of service.</td>
<td>A potential option may be to build a water reservoir with an impenetrable cover and then pump fresh water from nearby sources into this man-made lake. This would protect the drinking water source from the thawing permafrost and from the escaping methane.</td>
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<tr>
<td>Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.</td>
<td>Methane gas escapes from the permafrost and rises into the atmosphere, the drinking water in lakes, and in rivers which affects the riverine/marine life.</td>
<td>Villagers can build new boat launch pads and docks where water depth allows use of propellers, along with parking areas for the trucks and roads to the new launch areas.</td>
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<td>Methane rising to tundra—changes “taste” of lichen, moss, etc. for caribou and other land animals</td>
<td>NSB Wildlife biologists and subsistence hunters should observe the behaviors of tundra-dependent animals to determine if this is a significant problem. If it is, it may be necessary for the NSB to experiment and “grow” lichen and moss seeds and spread them around a traditional caribou migratory route or create a new migratory route with the plant life that they find suitable.</td>
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<td>Warmer weather causes thinner lake, river and sea ice.</td>
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<td>Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.</td>
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<td>Less stable ground, subsidence and differential settlement of structures. Sanitation and health problems result from broken sewer and water lines within the villages.</td>
<td></td>
<td>Among other measures, the NSB could assist the villages in procuring gravel to shore up buildings, roads and other infrastructure. It may be fruitful to partner with research universities to create a new material that can be produced locally in each village that functions like or better than gravel.</td>
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<td>Flooding and structural failure of ice cellars. This can result in food contamination and, if ice cellars need to be abandoned, can lead to food insecurity as there is no room in village homes for storage of a freezer. This would lead families to be dependent on “store bought” food which lacks the nutrients of traditional, local foods.</td>
<td></td>
<td>Although culturally difficult to adjust to, it may be necessary for the village leaders to build a community or co-op ice cellar in a convenient location. The location should be convenient to hunters as well as to family members retrieving the foodstuff.</td>
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<td>Early snow melt.</td>
<td>Early snow melt on land exposes the mushy/marshy tundra and reduces the hunting season and tundra travel is too difficult. Early snow melt may alter subsistence species’ migratory schedule and routes, causing hunters to travel greater distances to find the resource. Early snowmelt results in reduced days for oil &amp; gas industry to traverse frozen ground for exploration, development or transporting the resource to market. Limited season for ice roads.</td>
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<td>Increased inland rain.</td>
<td>Increased rain on snow events during winter cause a layer of ice to form over tundra vegetation preventing grazing by animals like caribou and muskoxen; this causes die-offs of these animals.</td>
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<tr>
<td>Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires.</td>
<td>Warmer weather inland causes drying of tundra which makes the land susceptible to lightning-caused fires which can spread for many miles. Warmer weather also causes lakes to dry up from evaporation, along with the thawing permafrost and resulting draining. Increase fire-fighting capabilities for both wild fires and structures. Protect drinking water lakes or develop new reservoirs with lining that protects against leaks and methane releases from underlying permafrost.</td>
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<td>(continued)</td>
<td>Drier tundra soil cause berries to ripen early and spoil faster.</td>
<td>Tundra ecosystems could change to spruce/aspen forests and grasses could be incorporated into the tundra. Shrubs entering the tundra could attract moose while decreasing the lichen for caribou.</td>
</tr>
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<td>Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires.</td>
<td>Warmer weather increase insect harassment for berry harvesters. Intrusion of non-native species that may cause environmental harm; some species such as salmon species and cold-tolerant crab may increase in abundance in arctic waters. This may attract commercial fishing industries to the arctic seas which could diminish subsistence resources.</td>
<td>New plant species could attract new species of pests which could annoy caribou.</td>
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<td>Intrusion of non-native species that may cause environmental harm; some species such as salmon species and cold-tolerant crab may increase in abundance in arctic waters. This may attract commercial fishing industries to the arctic seas which could diminish subsistence resources.</td>
<td>Declining or shifting wetlands could affect migratory or resident bird species.</td>
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<td></td>
<td>Drier tundra soil cause berries to ripen early and spoil faster. Warmer weather increase insect harassment for berry harvesters. Intrusion of non-native species that may cause environmental harm; some species such as salmon species and cold-tolerant crab may increase in abundance in arctic waters. This may attract commercial fishing industries to the arctic seas which could diminish subsistence resources.</td>
<td>Industrial development relying on ice roads for access to development sites could be stymied by a reduced supply of water to create the roads.</td>
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<td>A drier tundra: Although rain will increase, evapotranspiration and water drainage from cracks in the permafrost will cause a drier tundra that will be susceptible to more numerous and intense tundra fires releasing carbon and contaminants like mercury into the atmosphere.</td>
<td>Villages do not have the trained staff or equipment to extinguish wildfires which threaten homes, traditional foods, food sources for wildlife and creates smoke which causes or exacerbates respiratory illness in humans and animals. Wildlife change their migratory routes in subsequent years due to the damage to their foodstuff and nesting/calving lands.</td>
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<tr>
<td>Slow recovery of vegetation or vegetative shifts after fires can profoundly affect wildlife. Lichens, a critical winter food for caribou, recover extremely slowly. Loss of food for caribou cause the herd to change routes which may be a greater distance from the village causing economic hardships (gas, equipment repair, time) and hazards (thinning ice) for subsistence hunters.</td>
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<td>Acid Rain.</td>
<td>The North Slope is fortunate that major contaminant transport pathways tend to lead elsewhere, such as Canada and Greenland. The Slope receives some contaminants from Asia but levels are still relatively low. Consumers of subsistence-harvested foods from the North Slope are fortunate that the scientific analysis that the NSB Wildlife Management Department conducts have shown very low levels of POPs to be present in many of the subsistence foods that we eat and are below levels of public health concern. 337 Their studies demonstrate that subsistence foods are healthy foods.</td>
<td>The NSB Wildlife Management Department continues to monitor and analyze subsistence animals for human dietary health benefits as well as for potential impacts of consuming toxins. Hunting and harvesting marine and riverine animals and air and terrestrial animals is an important part of the Iñupiaq lifestyle. It is not only an important part of their culture, passed down through the generations, but it also provides food. Traditional subsistence foods provide relatively inexpensive and readily available nutrients, essential fatty acids, antioxidants, calories, protein, and many health benefits. Some of these benefits include protection from diabetes and cardiovascular disease, improved maternal nutrition and neonatal and infant brain development. Severely limiting the consumption of traditional foods may result in harm because reduction of the consumption of foods that have health benefits may increase the consumption of less healthy “store bought” foods.</td>
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| These toxins are called Persistent Organic Pollutants (POPs) because they are persistent: they travel long distances; they persist long after they are released at their source and move from air and water into spoil, plants, animals and humans; they magnify in living organisms and accumulate in fat, organs and muscles; they can reduce the animal’s ability to conceive and carry offspring; they decrease the animal’s ability to fight off disease; they can impair brain function; and a number of POPs are carcinogenic, causing cancers. | Migratory birds can have 100 times higher concentrations of POPs compared to birds that do not migrate. | In the Arctic, human exposure to toxins occur primarily through eating of subsistence foods.  
334 335 336 |

https://evostc.state.ak.us/media/2798/0602_status.pdf.  
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<td>Higher levels of ultraviolet (UV) radiation. Due to greenhouse gas effects of the stratospheric ozone temperatures, UB radiation in the Arctic is projected to remain elevated.</td>
<td>Increased IV exposure can cause skin cancer, cataracts, and immune system disorders in humans. Elevated UV can disrupt photosynthesis in plants and can have detrimental effects on the early life states of fish and amphibians. Risks are greatest in the Spring when sensitive species are most vulnerable, and warming-related declines in snow and ice cover increase exposure for organisms normally protected by such cover.</td>
<td>Vigilance and adaptation to changing conditions are required. Alaskan Native communities have for centuries adapted to scarcity and environmental variability and, thus, have developed deep cultural reservoirs of flexibility and adaptability; this tradition must continue.</td>
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<td>Multiple Impact Stresses.</td>
<td>Weather-influenced changes to the ecosystem cause overlapping stresses which amplify or exacerbate any one impact.</td>
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Appendix C: Response to Public Review Comments

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Appendix D: Resolutions of Plan Support

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