



Arctic National Wildlife Refuge U.S. Fish and Wildlife Service Summary of Activities



**Prepared for Eastern Interior and North Slope
Regional Advisory Councils - October 2021 (revised
for Winter 2022 meetings)**

**Arctic National Wildlife
Refuge 907-456-0250,
800-362-4546**

arctic_refuges@fws.gov, <http://arctic.fws.gov>

Refuge Staffing Changes:

- Refuge Manager Steve Berendzen has moved to a new position in Central Washington effective February 14, 2022.
- Arctic Refuge Oil and Gas Specialist Josh Rose has moved to a new position in Southern Oregon effective February 28, 2022.

Oil and Gas Leasing Programs:

- The new administration issued an Executive Order that put a pause on any further work on the Arctic Coastal Plain Oil and Gas program.
- Under direction of the administration and the Department of Interior, the BLM has initiated a Supplemental EIS for the Coastal Plain.
- Field Projects/Research – Refuge staff and collaborative researchers completed numerous monitoring and research projects during 2021 summer season. These included projects investigating caribou habitat selection research, several studies on nesting avian species, small mammal (i.e. lemmings) research, and Arctic Fox monitoring. Project continuation is planned for 2022.

Biological Monitoring and Research

- Tundra Nesting Birds at the Canning River Delta
The Canning River Delta study site in Arctic Refuge was established in the late 1970s and has since become the primary tundra nesting bird research station for the refuge. Work at this location is a collaboration between numerous partners, including Arctic National Wildlife Refuge, FWS External Affairs, FWS Migratory Birds, Manomet, Inc., the Wildlife Conservation Society, University of Alaska Fairbanks, the U.S. Geological Survey, Alaska Department of Fish and Game, Washington Department of Fish and Wildlife, and Oregon Department of Fish and Wildlife. Many of the species we study at the Canning Delta are Priority Refuge Resources of Concern (ROC), and the study site includes habitat types such as coastal wetlands, tundra lakes and ponds, and moist and wet sedge-shrub meadows that are separately listed as Priority ROCs (<https://ecos.fws.gov/ServCat/DownloadFile/201641>). Crews fly into the camp in early June and typically demobilized the camp in late July.



Figure 1. 2021 Canning River Delta field camp



Figure 2. Researcher aging and measuring eggs at a cackling goose nest at the Canning River Delta study site.

2021 marked yet another step forward in our effort to implement a more multidisciplinary approach to research projects at the site which includes collection of data on wildlife and their habitats (for example see our recent collaborative publication on standardizing herbivory monitoring <https://cdnsiencepub.com/doi/10.1139>). This work is important to scientifically inform management decisions as we enter into a new period of resource development in the Refuge and to better understand how climate change is impacting the species and habitats that occur there.

In addition to the core bird monitoring work we have conducted in the past, this past year we continued efforts on a variety of collaborative avian projects. We are tracking the movements of American golden plovers and pectoral sandpipers as they migrate across the Americas. The transmitters we use are tiny, weighing < 4 g (for reference a penny weighs 2.5 g). These devices collect location data every day and then send it to orbiting satellites. An interesting note from this summer's results is that 2 of the pectoral sandpipers whose nests were depredated at the Canning Delta, appear to have left the Canning a few days after their nests failed and fly up to 1400 km east into Canada and reneest in the Canadian Arctic.



Figure 3. Researchers attaching a transmitter to pectoral sandpiper at the Canning River Delta study site.

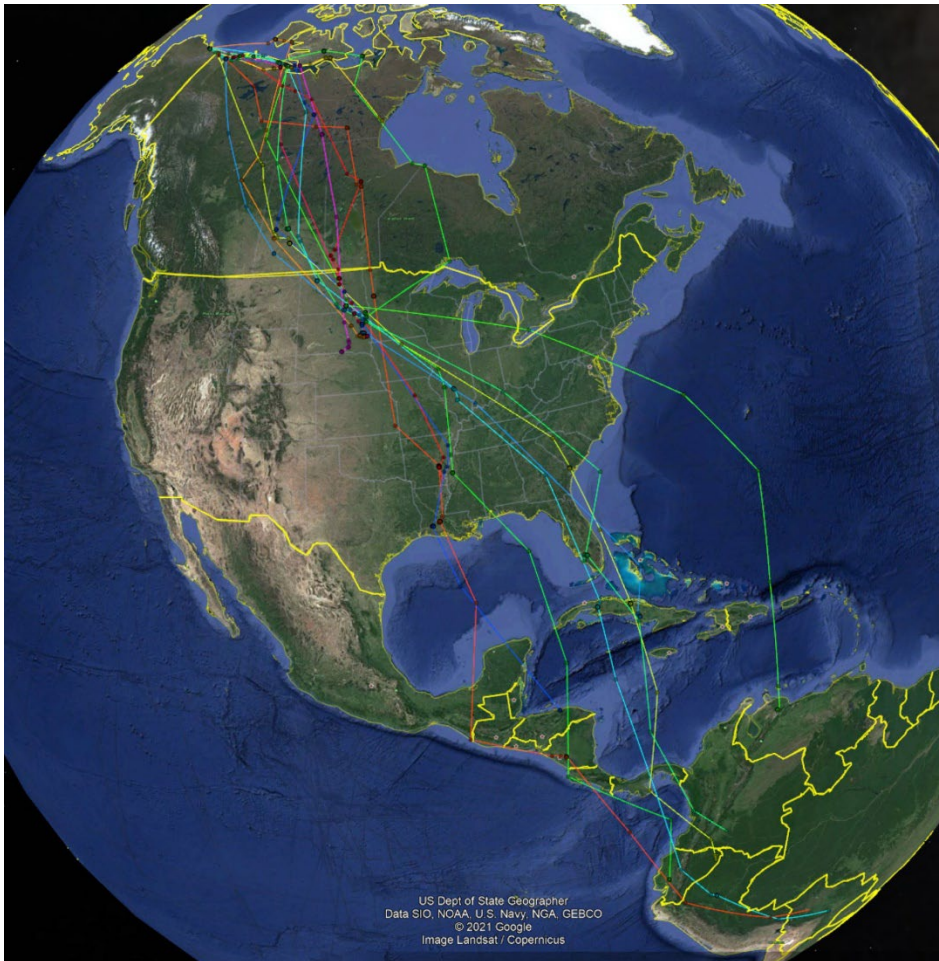


Figure 4. 2021 migration routes of pectoral sandpipers captured on nests at the Canning Delta camp and tagged with 4 g GPS transmitters.

Last summer we expanded our collaborative work tracking the behavior and migration of cackling geese by tagging birds at both the Canning and near Prudhoe Bay. Cackling geese have increased 10 fold at our study site over the last several decades and are now the most common waterbird we encounter. Our work seeks to track the post-breeding and wintering movements of cackling geese by attaching 25 g neck collars (about the weight of a single aa battery) that collect a GPS location every 15 minutes then transmits the data via cell towers when the birds enter areas of cell coverage in Canada and the lower 48. In prior years, all the birds that have reported data spent at least some of the winter in Albuquerque, NM. Some of these birds wintering in Albuquerque have used our sister National Wildlife Refuge, Valle de Oro, and others grazed at school ballfields.



Figure 5. Researcher holding female Cackling goose captured from nest at the Canning River Delta study site and fitted with a solar-powered GPS transmitter neck collar.

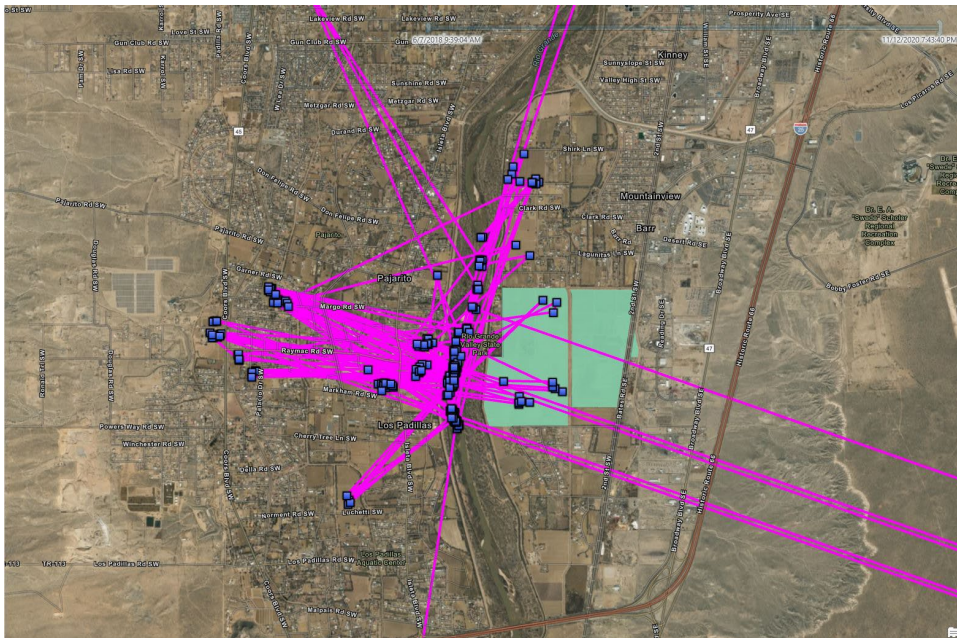
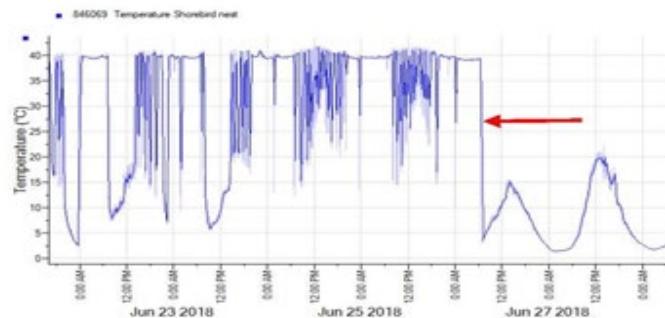




Figure 6 and 7. Locations in December-February in Albuquerque, NM of cackling geese fitted with gps transmitters the previous summer at the Canning River Delta in Arctic NWR. The top figure shows birds use of Valle de Oro NWR (green fill), and the bottom shows birds use of ballfields at West Mesa High School.

We also continued work on a project to track the movements of red-throated loons that breed on the Refuge to determine how they use the coastal lagoons (see prior years report: <https://pubs.er.usgs.gov/publication/ofr20211029>). We also conducted scoping efforts to help finalize protocols for a collaborative aerial loon survey that will begin later in 2022. We are also continued efforts to use novel ways to reduce costs and minimize our disturbance to the tundra environment, including the use of small cameras and temperature logger at nests to monitor behavior and predation events (for example, see our recent publications on the efficacy of using cameras to monitor shorebird nests <https://onlinelibrary.wiley.com/doi/10.1111> and how we use temperature loggers to study links between shorebird behavior and environmental conditions <https://www.sciencedirect.com/science/article/abs/pii/S0048969720360149>).



(left) Tinytag temperature logger. The yellow box is buried ~0.5 meter from the nest and the thermistor probe (upper left of the photo) is put in the nest bowl level with the top of the eggs to maintain contact with the brood patch. (right) Tinytag graph shows the incubation behavior and depredation (red arrow) of a red phalarope nest.



Figure 9. Red phalarope chicks in nest bowl with temperature logger sensor that measures incubation behavior and provides cues we use to determine nest success or failure.

- Small mammals at the Canning River Delta

Small mammal species such as lemmings and voles, typically undergo dramatic multi-year population cycles, with some years of high population peaks, followed by years of severe population crashes. These extreme fluctuations can cause cascading effects in other wildlife species in arctic food webs. For example, peak lemming population years have been linked to increased breeding success of tundra nesting birds. In these years, the huge abundance of lemmings on the tundra causes predators of birds and their nests, such as arctic fox, to preferentially consume lemmings, thereby shielding tundra nesting birds from predation pressure. However, this relationship is unconfirmed for most of the Alaskan North Slope. To address this, this summer we initiated pilot research to investigate the relationship between tundra nesting bird nest success and small mammal populations, and document annual small mammal population dynamics on the coastal plain of Arctic Refuge.

In June and July 2021, at the Canning River Delta, we used grids of live-traps to capture small mammals for sampling and tagging. While small mammal abundance is typically determined by mark-recapture methods, where marked animals are repeatedly recaptured over a set period of time, we instead tested novel recapture methods including the use of game cameras and RFID (radio frequency identification) readers to observe small mammals marked with an RFID tag under the skin. Research accomplishments of the 2021 field season included the first successful small mammal captures at the Canning River Delta since the early 2000's and demonstrating the effective use of our novel remote monitoring equipment in the harsh weather conditions of the North Slope. The small mammal work will continue in 2022 at the Canning River Delta and possibly other regions of the coastal plain of Arctic Refuge.



Figure 10. Researchers at the Canning River Delta processing a live-captured small mammal



Figure 11. A collared lemming captured at the Canning River Delta for sampling and tagging.

- Foxes at the Canning River Delta

Due to the effectiveness of foxes as predators, a large driver of bird productivity on the Arctic Coastal Plain is fox abundance. In addition, arctic foxes are likely to be negatively impacted by climate change with increased threats from habitat loss, competition with red foxes, and changing prey abundance. In 2021, arctic and red fox research at the CRD involved collecting scat, saliva, and hair samples at known den sites and depredated nests, with a focus on collecting samples most likely to contain viable DNA for determining

individuals and genetic relatedness. We collected more than 50 samples this summer. In cooperation with the U.S. Geological Survey, we have developed genetic analysis methods to help investigate fox predation on ground-nesting birds on the Arctic Coastal Plain. Samples collected at the Canning River Delta in 2017-2019 were recently analyzed by colleagues at the U.S. Geological Survey Molecular Genetics Laboratory, who are currently finalizing the report for this work.



Figure 12. Adult arctic fox with a greater white-fronted goose.



Figure 13. Arctic fox kits at the Canning River Delta.

- Whimbrel monitoring at the Katakaturuk River

The Katakaturuk River study site in Arctic Refuge was used in 2019 as a base for shorebird density surveys. During that work we located several whimbrel nests and returned this summer to monitor the survival and ecology of the birds and to place tracking devices on some of the birds. Work at this location is a collaboration between Arctic National Wildlife Refuge, FWS Migratory Birds, and Manomet, Inc. Because these shorebirds are bigger than those we have tagged in the past at the Canning Delta, we are able to use larger transmitters that weigh about 5-10 g. Our partner put together a great synopsis of the work (<https://www.manomet.org/publication/whimbrels-in-the-arctic/>).



Figure 14. Migration routes of whimbrel captured on nests at the Katakaturuk River study site in 2021 and tagged with solar-powered transmitters.

- Gray-headed Chickadee study

Gray-headed chickadee may be one of the most imperiled birds that breed in northern Alaska, and Arctic Refuge appears to be one of the only areas in North America the species has regularly been spotted in the last decade (see the recent publication by our partners: <https://meridian.allenpress.com/jfwm/article/11/2/654/436145>). Gray-headed chickadee are the 4th highest ranked Resources of Concern (ROC) on the Refuge and the only individual bird species listed as an ROC (<https://ecos.fws.gov/ServCat/DownloadFile/201641>). This past summer we collected samples for a collaborative study with FWS Migratory Birds, the U.S. Geological Survey, and the Alaska Department of Fish and Game to determine if hybridization between the gray-headed chickadee and a recent colonizer, the boreal chickadee, may help explain the

decline. Staff conducted two surveys for boreal chickadee along the Coleen and Sheenjek Rivers. The first survey took place the first week of August 2021, when biologists used mist-nets to capture and obtain DNA samples from boreal chickadee. In early September 2021, two staff floated the Sheenjek River to conduct the second part of this research.



Figure 15. Boreal chickadee captured using a mist-net in Arctic NWR in August 2021.

- Ongoing monitoring of Porcupine Caribou Herd Partners (ADFG, Yukon Government, USFWS, and USGS) have continued monitoring the Porcupine Caribou Herd movement, habitat use, and population trends through radio-telemetry and aerial surveys.
- Research Publication – Porcupine Caribou Herd

Biologists at USGS, USFWS, and the Department of Environment (Yukon Government) carried out an analysis of how spring vegetation phenology affects the spatial ecology of the Porcupine Caribou Herd (PCH). In years with early spring green-up, the herd primarily used habitat in Alaska. In years with late green-up, they spent more time in the Yukon. Future climate conditions and green-up patterns indicate a shift in PCH calving and post-calving distributions further west into Alaska. (Severson et al. 2021. *Spring phenology drives range shifts in a migratory Arctic ungulate with key implications for the future*. Global Change Biology. DOI: 10.1111/gcb.15682).

- Diet Research Porcupine Caribou Herd

Biologists at Arctic Refuge carried out field activities on the North Slope and Coastal Plain of the Arctic Refuge to support a collaborative research effort by USGS, FWS, and the Yukon investigating the diet of the Porcupine Caribou Herd (PCH) during the calving, post-calving, and insect-relief periods. We collected over 475 fecal samples from over 90 locations across the PCH's seasonal range. These samples were sent to a lab for DNA metabarcoding to decipher diet attributes.



Figure 16. Porcupine Caribou on the Arctic Coastal Plain

- Sheep Surveys

No Dall sheep surveys were conducted within the Refuge in 2021.

- Moose Research Project

Arctic Refuge has initiated a moose research project in cooperation with the National Park Service, the Bureau of Land Management, and the University of Alaska to gain a better understanding of migratory patterns, seasonal distribution, spatial ecology, and population of moose inhabiting the Brooks Range and Coastal Plain of the Refuge and adjacent National Park Service (NPS) and Bureau of Land Management (BLM) areas and to investigate the environmental factors driving these patterns so we can design viable management and conservation strategies at a landscape scale. Laboratory analyses of diet have already begun.

Public Use Management

- Polar Bear viewing – For a second year, Special Use Permits for Polar Bear Viewing were not issued and no boat based commercial guiding was conducted in 2021. Staff also continue to coordinate with the Marine Mammals Management Office of the USFWS to help support the community in addressing human-bear issues that occur when bears return to the region each fall.
- Hunt Guide Use Area Offerings – In August of 2021, eight of the Arctic National Wildlife Refuge Guide Use Areas (GUA) were opened for guiding proposals from all State of Alaska registered guides. All of the GUA offered are currently filled through 2023. The application period for these areas ends on April 11, 2022.
- Historic Access Study - Arctic Refuge contracted with a 3rd Party vendor to conduct a Historic Access Study to determine historic access methods and means for subsistence purposes, with a focus on off-road vehicles (ORVs) for the villages of Kaktovik, Arctic Village, Venetie, Ft. Yukon, Chalkyitsik, and Coldfoot. A final report is near completion and will be made available to the participating communities when finalized.
- Arctic Village Sheep Management Area (AVSMA) – Arctic Refuge clarified new regulations for the new state hunt opportunity recently passed by the State Board of Game that would occur within the boundary of the federally designated AVSMA. The area was labeled as “Eastern Brooks Range Management Area” and it directly overlays the Federal AVSMA. There was some early confusion as to whether the AVSMA area was open to non-qualified users during both the Youth Hunt in early August and during the winter hunt beginning in October. The area is *not open to either hunt* on Federal lands within the special management area (over 99% of the area). Refuge staff developed a communication poster (Figure 17) and posted it in Arctic Village, Coldfoot, and Happy Valley as well as online to better inform the public.



U.S. Fish & Wildlife Service

Attention Sheep Hunters in Game Management Unit 25A

Arctic National Wildlife Refuge

If you are planning to hunt sheep in Game Management Unit 25A, be advised that the area defined as the Eastern Brooks Range Management Area (EBRMA) in the Alaska State regulations is closed to all non-federally-qualified users, including closed for the youth hunt and the winter hunt (RS595).

The entire Arctic Village Sheep Management Area (AVSMA) (known as the EBRMA in State regulations) is closed to sheep hunting except by federally qualified residents of Arctic Village, Venetie, Fort Yukon, Kaktovik and Chalkyitsik. Qualified hunters must have Federal registration permit FS2502 to hunt sheep in the AVSMA.

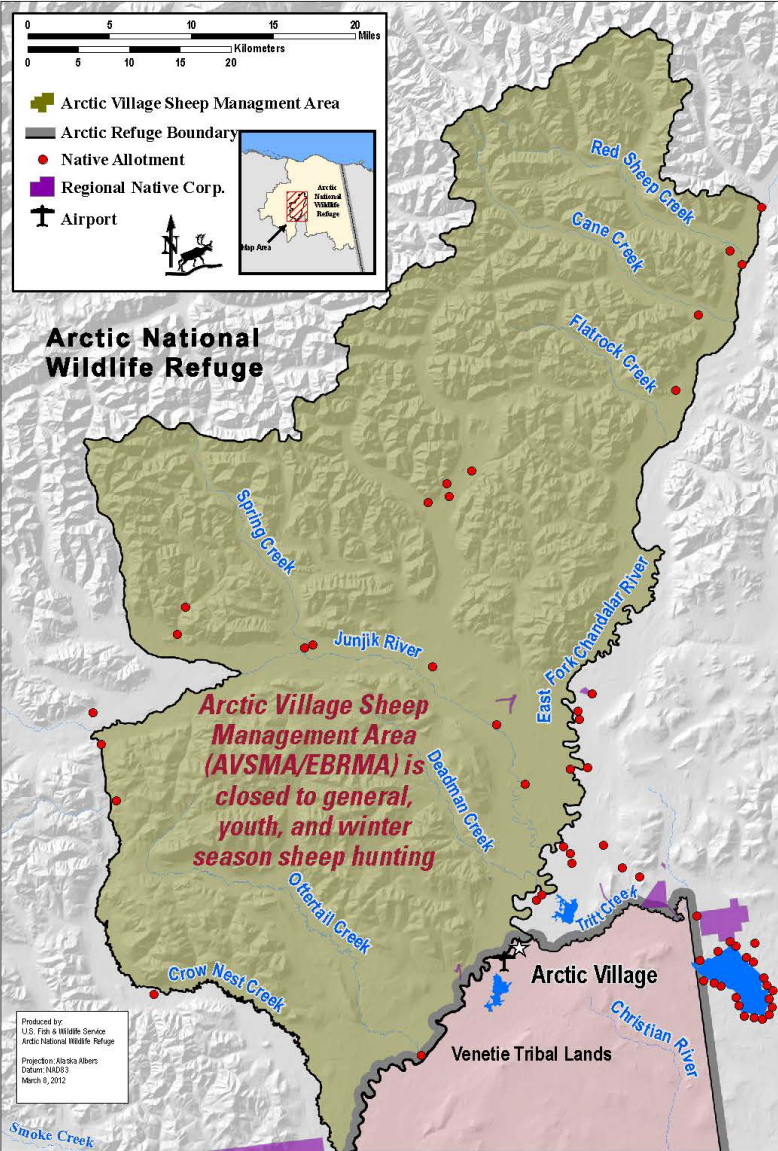
Regulation for Unit 25A – Arctic Village Sheep Management Area: 2 rams by Federal registration permit only, August 10 to April 30. Federal public lands within the AVSMA are closed to the taking of sheep except by rural Alaska residents of Arctic Village, Venetie, Fort Yukon, Kaktovik, and Chalkyitsik hunting under Federal harvest of wildlife regulations.

General hunting of any game species other than sheep is allowed in the AVSMA during hunting season.

The AVSMA was established in 1995 in response to concerns from local rural residents about conflicts with general hunters. The Alaska National Interest Lands Conservation Act (ANILCA) provides authority to protect subsistence uses in particular areas. The AVSMA protects subsistence sheep hunting opportunities and provides a mechanism for reporting harvests.

Boundary description – You can find the legal boundary description for the AVSMA/EBRMA in both the State and Federal regulations handbooks.

Please be respectful and do not enter private lands. The red dots on this map show their general locations.



Arctic National Wildlife Refuge
 907/456 0250 800/362 4546
 arctic_refuge@fws.gov http://arctic.fws.gov/
 facebook.com/arcticnationalwildliferefuge

Figure 17: Outreach poster for the Arctic Village Sheep Management Area

Resource Management

- Barrel Extraction – As part of a long-term and on-going effort by the Refuge, staff removed spent oil barrels from two sites on the coastal plain of Arctic Refuge in early September. Old barrels are a potential source of contamination and decrease wilderness character and visitor experience. Barrels were transported to Kavik via sling loads using a R44 helicopter. In the Camden Bay area, 21 barrels were extracted and 8 barrels were removed from the Canning River Delta.



Figure 18: Oil barrels that were removed in early September 2021 from the coastal plain of Arctic National Wildlife Refuge.

- Fuel Tank Removal – Refuge staff worked to remove two 4,000 gal fuel tanks from Barter Island that were no longer in use by the refuge. Staff worked with GSA to excess the property. With no official bids received, the tanks were released to proceed with disposition by sale or other disposal action. With no local interest in the tanks, their removal from the island became a priority. In early August 2021, the tanks were barged to Prudhoe Bay where they were purchased by a local business owner. A considerable amount of funding was saved by not having to truck the tanks to Fairbanks. In their successful removal, we had the opportunity to be good neighbors by removing our unused items from Barter Island, to be proactive in finding another use for the tanks, and to remove any future environmental compliance concerns from their presence on Barter Island.

