

### Yukon Flats National Wildlife Refuge 2024 Annual Staff Report

October 2023 – September 2024

Photo, sunrise in the Refuge by U.S. Fish and Wildlife Service.



#### Ana basee. Mahsii' choo.



Photo, Yukon Flats National Wildlife Refuge by U.S. Fish and Wildlife Service.

The staff of the Yukon Flats National Wildlife Refuge have many responsibilities. Much of our work would not be possible without the support of others too numerous to mention. From our on-the-ground access across lands owned by a village or regional corporation to the sharing of information across social media, each and every day our friends and neighbors help us steward this amazing landscape for current and future generations.





Photo, the Yukon River provides spawning habitat to sheefish, Bering cisco, and other whitefish species.

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Photo, taken during duck banding in the Refuge, by U.S. Fish and Wildlife Service.

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Photo taken during brood surveys (2023) by U.S. Fish and Wildlife Service.

### **Refuge Overview**

Yukon Flats National Wildlife Refuge was established in 1980 and has several purposes defined by law, including conserving fish and wildlife populations and habitats in their natural diversity, fulfilling the international treaty obligations of the United States with respect to fish and wildlife and their habitats, providing subsistence opportunities for local residents, and ensuring water quality and necessary water quantity within the Refuge. Home to over 1,200 mostly indigenous people who have occupied these lands for thousands of years, the Refuge boundary encompasses over 11 million-acres of land (8.63-million federally managed acres) in

east-central Alaska. The Yukon River sculpts the vast Yukon Flats floodplain as it flows. Countless lakes, ponds, and streams in the basin support wildlife and humans as they have for generations.

Through biology, outreach, and enforcement, Yukon Flats staff partner with others to conserve resources and monitor animals and habitats that are important from local, national and global perspectives. This report is a summary of staff activities occurring between October 2023 through September 2024.



# **Moose Population**

A moose survey was conducted in March 2023 for the western Yukon Flats. The estimate was 675 total observable moose. The density was 0.30 moose per square mile with 589 adults and 88 calves. Spring moose numbers were above the long-term average and the proportion of calves was intermediate relative to previous spring surveys. A moose survey of the eastern Yukon Flats is scheduled for November 2024.



Photo, moose by Tom Koerner/U.S. Fish and Wildlife Service.



Figure 3. Estimated observable spring moose total (with 90% confidence interval) for the western Yukon Flats.



#### Peak and Crash of Lynx and Snowshoe Hare Populations

Trail cameras capture life in the Yukon Flats year-round. Since 2016, up to 34 cameras have been operating. This story is one highlight from this project. A camera trap study was conducted during 2016-2022 in Yukon Flats National Wildlife Refuge. Sixteen to 34 cameras operated year-round. Placement of cameras across the Refuge was stratified random in 100 km2 sample units. Cameras were checked in spring or summer and SD images were cataloged in a database. Relative abundance was assessed as independent detections/trap nights.





Independent detections represented triggers separated by >60 minutes. Time period was July 1 until June of the following year. The lynx population peaked in 2018-2019, declined the following winter, and crashed by 2020-2021. Lynx numbers likely declined from reduced survival, and dispersal of individuals in search of snowshoe hares. Snowshoe hare numbers crashed a year earlier in 2018-2019. Experimentation has demonstrated that snowshoe hare populations crash from predation and stress from predator chases.



# Lynx Movement Study

Refuge staff have been monitoring lynx movement patterns, dispersal behavior, and survival in relation to snowshoe hare abundance since 2017. Lynx and hare numbers are beginning to increase from the low point in their population cycles. Three lynx were captured and collared in 2024. We have learned that lynx can disperse great distances, sometimes over a 1,000 miles, when their food source- snowshoe hare, is depleted. There appear to be no barriers to lynx movements with direct crossings documented over mountain ranges and the largest rivers in Alaska and Canada.



Photo, a lynx by Chase Cote/U.S. Fish and Wildlife Service.



A White Mountains sheep survey was completed in July 2024 by ADF&G and the Refuge. Overall counts of rams, ewes and lambs were similar to 2023 with a healthy proportion of observed lambs for the second straight year.

Photo of Dall sheep ewes in the Refuge by U.S. Fish and Wildlife Service.



# **Sheep Survey**

### Waterbird Surveys – Scoters, Scaup and Loons

2024 marked the twenty-third year of annual aerial surveys to monitor scoter, scaup and loon populations in the Yukon Flats. Since Yukon Flats has some of the highest nesting densities of these species in Alaska, therefore these annual surveys monitor their health in the Alaska boreal forest. Waterbirds are also important indicators of good water quality and healthy habitats. Results from the 2024 scaup and scoter surveys are still being tabulated so we provide the graph (next page) with a historical summary of whitewinged scoters and scaup through 2023. The 2024 August loon survey is currently being conducted.

# **Eyes in the Bush**

Eyes in the Bush resource monitoring program was established in 2021 to monitor measures of snow, thawed soil and air quality; dates for green up, river ice in/out, and migratory bird arrival; early detection of emerging soilbased pathogens, invasive plants and ticks; and fire monitoring. The information is recorded in the Indigenous Sentinels Network (ISN) database, which provides Indigenous communities with tools, training, networking and convening, coordination, and capacity for ecological, environmental, and climate monitoring. Villages that have participated in the program have included Beaver, Circle, Fort



Photo, a Lesser Scaup, by U.S. Fish and Wildlife Service.



Photo, willow plants in early spring with buds emerging, a sign of green up in the Refuge, by U.S. Fish and Wildlife Service.

Yukon and Venetie. If you are interested in expanding this effort to your Yukon Flats community, contact the Refuge Biologist, Mark Bertram at 1-907-347-1524 for more information.



# Waterfowl Surveys –Scoters, Scaup and Loons



<sup>95%</sup> confidence limits.



### Invasive Plant Surveys in Yukon Flats and Interior Alaska

The U.S. Fish and Wildlife Service manages invasive species collaboratively with public and private organizations. Refuge staff work closely with the Fairbanks Soil and Water Conservation District (FSWCD) to survey and document terrestrial and aquatic plants that are not local to Interior Alaska. Some of these non-local plants are considered invasive when their introduction does or is likely to cause economic or environmental harm to human health.

Our goal is to prevent and control the spread of invasive plant populations (on land and water) in refuges and private lands. The Refuge and FSWCD have conducted early detection surveys on interior Alaska rivers and in Yukon Flats communities since 2010. Fairbanks Soil and Water Conservation District crews hope to conduct invasive plant surveys in Steven's Village and Chalkyitsik at the end of this season.

Refuge staff conducted an invasive white sweetclover survey on sandbars, from the Yukon River bridge up to the mouth of Victor Slough, and did not find any



Photo by Delia Vargas Kretsinger and U.S. Fish and Wildlife Service, August 11, 2024.

invasive plants, just thousands of newly germinating sandbar and feltleaf willow plants (future winter food for moose).

Invasives can directly affect Alaska's native wildlife populations by outcompeting vegetation that wildlife and subsistence users depend on. Aquatic invasives like Elodea can degrade salmon spawning beds. This could adversely impact Yukon River salmon population numbers which are already imperiled. Elodea can also make boat travel difficult, possibly preventing access to favorite hunting grounds. Photo illustrates an expansive sandy gravel bar on the Yukon River covered in newly germinated sandbar willow seedlings up to 3" tall. These sandy deposition areas are also areas where non-native invasive plants could germinate and eventually establish.



## **Duck Brood Production Survey**

#### Lesser Scaup

Production in 2023 was similar to the longterm average at Canvasback Lake, Plot F and Shack Lake and greater than the long-term average at Track Lake.

#### White-winged Scoter

In 2023, production at Canvasback Lake was below average, average at Plot F, above average at Shack Lake, and well above average at Wetland by Track Lake. Age classes were heavily skewed toward younger ducklings.

#### Canvasback

In 2023, production was well above average at Wetland by Track Lake, similar to the longterm average at Canvasback Lake, and below average at Shack Lake and Plot F. Age classes included a mix of young and moderate age ducklings.



Photo, a Horned Grebe, by U.S. Fish and Wildlife Service.

#### American Wigeon

2023 production was better than average at Wetland by Track Lake, Shack Lake, and Plot F, and average at Canvasback Lake. Age classes trended toward the moderate age classes, 1b-2b, with some class 3 ducklings.

#### **Green-winged Teal**

2023 production was similar to the longterm average at Wetland by Track Lake, Canvasback Lake, and Shack Lake, and lower than average at Plot F. Age classes trended toward older ducklings.

#### **Horned Grebe**

Production was above average in 2023 at Plot F, similar to the long-term average at Shack Lake, and lower than average at Wetland by Track Lake and Canvasback Lake. Brood sizes tended to be low, probably because this species does not forage as a group like waterfowl.

Age classes were moderate to young, with a few individuals in the older classes.



### Survey of Bald Eagles and Other Stick-nesting Birds

The ninth annual survey of bald eagle nests and other stick-nesting birds was conducted on the Draanjik River in 2024. Results are below. One-time inventory surveys were conducted in previous years (since 2014) along the Yukon, Hodzana, Beaver, Birch, Porcupine and Tjeedrijjik rivers. Inventorving and monitoring bald eagle nests and foraging sites will provide information on their local densities, trends, and habitat use, and will provide a database needed for responsible management. Federal law (Federal Register: 50 Part 22) requires permits to disturb bald eagles. As management activities arise, such as requests for right-of-ways, special use permits, mining activities, land exchanges, etc., we are



Photo, a Bald Eagle by Lisa Hupp /U.S. Fish and Wildlife Service.

required to protect nests (active and inactive) and foraging sites.

This project is an effort to acquire data to properly support such actions. Results from the 2024 survey are still being tabulated.

	2014	2015	2016	2017	2018	2019	2021	2022	2023	2024
Bald Eagle	6	10	8	5	7	8	- 11	7	10	7
Raven	1		3		1	1				1
Great Horned Owl		1								
Northern Goshawk	2						1		2	
Osprey	5	4	6				1	1	2	1
Red-tailed Hawk				1						
Total	14	15	17	6	8	9	13	8	14	9

#### Number of Active Nests on the Draanjik River



#### **Duck Brood Survey**



Photo, a brood of Lesser Scaup in the Refuge by U.S. Fish and Wildlife Service.

In July 2024, a duck brood survey was conducted at four wetland complexes, Canvasback Lake, a wetland by Track Lake, Shack Lake, and Plot F. Data are being reviewed and preliminary observations were that brood numbers increased in 2024. A report is anticipated in December. No evidence of sick ducks from avian influenza was observed. Lesser scaup, pictured above, are the most common diving duck in the Refuge.



# **Duck Banding**



Ducks were banded at Canvasback Lake during August 2024. The goal of the project is to band mallards to inform harvest management. Mallard presence was down in 2024. Banded duck species included mallard (9), northern pintail (108), American wigeon (2), and green-winged teal (79). No sick or dead birds or other evidence of avian influenza was observed.

Photo, a Mallard hen and duckling, by U.S Fish and Wildlife Service.

### Geospatial Application Developed to Measure a Changing Landscape

Refuge staff entered into a partnership with the Geographic Information Network of Alaska at the University of Alaska Fairbanks to develop a web application that will allow managers and biologists the ability to easily display and summarize remotely sensed data to inform natural resource management. Staff will be able to spatially monitor the growing season, snow cover, surface water, wildfires and more through time. The new application will be highly interactive and easy to use allowing staff to produce maps, tables and figures that display change across the Yukon Flats Basin.



## Fire Management Pilot Project

A change was made in 2023 that moved eight areas (1.8-million acres) within the Refuge from fire management option Limited to Modified. These areas have not had fire since 1990 and sit atop Yedoma permafrost. Our intent is to preserve mid-to-late successional plant communities for habitat diversity, protect carbon-rich, deep Yedoma to delay the release of greenhouse gases into the atmosphere, and reduce air pollution and its impacts to subsistence users.

By elevating the default response to early season fires in these areas from Monitor to



Photo, discussions in Fort Yukon, by U.S. Fish and Wildlife Service.

Full Suppression, it is expected that annual Yedoma area burned will be reduced



Photo, researchers stand in front of Yedoma permafrost in Fox, Alaska, by U.S. Fish and Wildlife Service.

resulting in less loss of insulating duff, retention of older plant communities, increased Yedoma persistence, and lowered greenhouse gas emissions from Yedoma carbon stores. Additionally, some structures, allotments and private lands may be further protected from wildfire because of the option change.

Woodwell Climate Research Center and the Cary Institute of Ecosystem Studies have received funding to monitor the ecological and cost-effectiveness of the pilot project.

Given the fire history and resulting mosaic of successional vegetation communities in this area, there have been a relatively low number of fire starts in the past 20+ years.



continued...

# **Fire Management Pilot Project**

For all Yedoma (3.9 million acres) in the Refuge, fifty-five fire starts were recorded from 2000–2022, or 2.4 starts per year. In 2024, the Nation fire started outside one of the pilot areas and burned into it. No action was taken per the agreement with the Alaska Fire Service.

# **Fire Season Update**

As of August 15th, the Yukon Flats NWR has 8 known fires with a total perimeter of 25,325 acres. Actual acres burned are much lower than this total as fires typically burn in a mosaic pattern leaving large, unburned areas within the calculated perimeter. All fires were determined to be started by lightning with the first fire detection occurring on June 5th, the last known start was June 30th. No new fires were detected on the Refuge in July which is unusual. Of these 8 Refuge fires, 2 plotted within a modified fire management option and received full suppression actions from the Alaska Fire Service. Six fires plotted in a limited fire management option and will continue to be remotely monitored. The largest fire on the Refuge is the Nation fire which has a current perimeter of 15,376 acres. It started in an area with no recorded fire history and adjacent to where modeling suggests there is Yedoma.

It did eventually burn in this area and may have provided an opportunity to study firsthand, interactions between fire and Yedoma. This summer, Alaska has 657k acres of burn perimeter statewide. The long-term annual average for Alaska is approximately 1 million acres of fire perimeter.



Photo, the Ed Berg Slough fire in June by the Alaska Fire Service.



# Water Monitoring

In 2024 Dr. Tamlin Pavelsky, University of North Carolina, and crew installed automated water level gauges in 19 lakes in the Yukon Flats Refuge in support of NASA's Surface Water and Ocean Topography (SWOT) satellite mission. Additionally, water level loggers were installed on the Yukon, Chandalar, Porcupine, and Sheenjek rivers. These gages will evaluate the capabilities of the SWOT satellite mission, which is designed to remotely measure water levels.



Photo, surface water gage equipment mounted on a river boat on the Yukon River, by Tamlin Pavelsky.

#### Student Conservation Assocation Technician



Photo, Student Conservation Association Avian Technician Eric Dow checking snowshoe hare pellet transects at the Canvasback Lake study site by U.S. Fish and Wildlife Service.

SCA Technician Eric Dow had a busy field season assisting with waterfowl nest box, brood survey and banding projects, outreach at the Coldfoot Visitor Contact Station and the Gwich'in Gathering in Circle, and data analyses for the trail camera project. Nice work Eric!



# Law Enforcement Program

Senior Federal Wildlife Officer Cody Smith and new officer Collin Maier conducted aerial patrol for spring bear hunt season and contact was made with permitted guides. They conducted river patrols throughout Yukon Flats National Wildlife Refuge during fall moose hunting season.

In June, the officers also worked with others to contact a person suspected of breaking into a USFWS facility in Fort Yukon and removing numerous objects. Officer Maier worked with others to search for and locate a missing person on the Yukon River in July. Federal Wildlife Officer/Aircraft Pilot Cody Smith also participated in an aviation camp in August hosted by the National Park Service. He answered questions from students and shared about his career as a pilot.



Photo, Senior Federal Wildlife Officer Collin Maier in the field, by U.S. Fish and Wildlife Service.

# **Gwich'in Gathering**

Refuge staff participated in the Gwich'in Gathering hosted by Circle July 23-25. It was a great opportunity to listen and learn from Alaskan and Canadian Gwich'in leadership. We sponsored an archery instructional station and an information booth. It was also very exciting to see the outstanding flood recovery effort led by Circle which had relandscaped their village riverfront into an attractive camping area.

Photo. Traditional Chief Trimble Gilbert addresses the Gwich'in Gathering in Circle, Alaska, by U.S. Fish and Wildlife Service.





# Pollinator (Bee) Sampling

Pollinators play a key ecological role in ensuring seed and fruit production for plants. In the past 50 years there have been significant declines in bee populations nationwide. We participated in the Alaska Bee Atlas project again this year and collected samples from Shack, Track and Canvasback Lake, Plot F, and Circle. Collections from 2023 resulted in new bee species range extensions for Alaska.



Photo of a Heath Bumblebee found in the Refuge, by Stephen Falk, Flickr.



Photo, soil microbe sample site at Track Lake in the Refuge, by U.S. Fish and Wildlife Service.

# Soil Microbe Sampling

Recent increases in air temperature in Alaska has initiated warming of permafrost laden soils. Permafrost is a reservoir to microorganisms and viruses, some potentially viable. We have limited knowledge of the potential impacts to humans, animals and plants from thawing soils. In 2021 the Refuge teamed up with University of Alaska-Fairbanks to begin inventorying soil microbes. In 2024 we collected samples from Shack and Track lakes, in the western and northern regions of the Refuge.



#### **Bison and Moose Habitat Assessment**

In response to the State of Alaska's plan to release bison on state lands northeast of Circle in 2028, the Refuge will be conducting habitat assessments to estimate potential available food for both bison and moose in Refuge lands in summer 2025. The Refuge will also be collecting aerial photography to inform habitat assessment site selections.

Photo, Wood Bison, by Alaska Department of Fish and Game.



# **Rusty River Sampling**



Photo, a rusty water slough adjacent to Beaver Creek in the Refuge, by U.S. Fish and Wildlife Service.

Recent warming in Alaska has accelerated permafrost thaw, which can modify soils and watershed hydrology. Water scientists have detected the presence of iron in northern Alaska waters giving some rivers an orange or rusty appearance. The rusty colored waters have been detected in several locations in the Beaver Creek watershed in and adjacent to the Refuge. Refuge staff partnered with BLM this past summer to test the water quality of these waters so we can determine if there may be detrimental effects to fish and other critters living in the water.



#### Permafrost

Yedoma is Pleistocene-era, thick permafrost high in carbon and ice. It exists in the foothills surrounding Yukon Flats. We partner with permafrost and soils expert Torre Jorgenson to measure soil and water temperatures and thaw depths in both burned and unburned habitats. In 2024, USGS requested funds to survey the impacts of wildfire and wildfire management on permafrost vulnerability and soil carbon sequestration.



Photo, Torre Jorgenson monitoring soil temperatures at an old burn in the Yukon Flats, by U.S. Fish and Wildlife Service.

#### Annual Funding Agreement with the Council of Athabascan Tribal Governments



The U.S. Fish and Wildlife Service entered its 21st year of partnering with the Council of Athabascan Tribal Governments (CATG) under the Indian Self-determination and Education Assistance Act. Programs, functions, services and activities CATG employees perform include Eyes in the Bush monitoring in Circle and Fort Yukon; cultural and science camp; maintenance and logistics in Beaver and Fort Yukon; hunter liaison work in Circle; and a pilot project with tribes in Beaver, Birch Creek and Stevens Village to improve reporting outcomes for the 25D-West federal moose hunt.

Photo, the 10,000-square mile Yukon Flats Basin is central to the Yukon Flats Refuge, by U.S. Fish and Wildlife Service.





# **Staffing and Budgets**

Due to long-term funding declines for the National Wildlife Refuge System, the USFWS initiated a multi-year effort to thoughtfully adjust distribution of funding and staffing among the 16 refuges in Alaska. The intent was to meet Refuge System goals and priorities while giving flexibility to managers in response to unpredictable budget cycles. As a result, staffing and budgets for the Kanuti and Yukon Flats Refuges are being reduced. As staff leave or retire many positions will not be refilled and eventually the two offices may be merged with each retaining a manager. This plan is subject to change if funding for the Refuge System increases significantly. The USFWS offered consultation to Tribes and ANCSA corporations within the region. Responses have been in opposition to the merger and downsizing of Refuge staff.



Photo, Beaver Creek (looking south) by U.S. Fish and Wildlife Service.

Thankfully, we were able to refill two shared positions this year. We welcomed Deeann Robinson and Clayton Merrill. Deeann is the new budget technician and serves several other refuges in Alaska. Clayton is the new subsistence coordinator for Arctic, Kanuti and Yukon Flats Refuges. Dee grew up in North Pole and worked over a decade with the military. Clayton grew up in Maine and enjoys being outside in winter.

# **Status of Doyon-Hilcorp Project**

Last fall we reported that in 2021 we commented on Hilcorp applications for temporary water use authorizations to support a stratigraphic well program on lands adjacent to the Refuge. We learned this summer that Hilcorp is planning exploration activities on corporation lands near Birch Creek.



Photo, moose by Ryan Hagerty/U.S. Fish and Wildlife Service.

# **Hunter Liaison Project**

At the time of this writing, we anticipate a hunter liaison will be working in Circle. After consultation with CATG, a decision was made to not post a hunter liaison in Fort Yukon due to lack of hunters in the village in 2022. We appreciate funding support from the office of Yukon-Charley Rivers National Preserve in support of the liaison position in Circle.

# **Permitted Activities**

All permittees are required to avoid interfering with subsistence activities, and if operating aircraft to do so in a manner that does not result in harassment of wildlife. Five air taxi operators received a permit to provide services on Refuge lands and waters in 2024, if needed. Nearly twenty permits are valid for subsistence and trapping cabins. One filming permit was issued. Two big game guides and zero recreational guides operated in 2024.

Five scientific researchers were permitted to investigate the level of fire severity in recent burns, validate water surface elevation measurements, collect rock samples, collect lake sediment cores, and sample for anadromous fishes. The Poker Flats Research Range continued their annual operation under permit to retrieve rocket debris located in Refuge lands.



# Facilities and Property

The U.S. Fish and Wildlife Service constructed a bunkhouse in Fort Yukon that has already supported researchers working on migratory birds and icthyophonus in Chinook salmon.

This year repairs were made again to the security fence in Beaver after a windstorm toppled a large spruce tree.

Work was initiated by local contractors in Fort Yukon to create a parking pad and relocate two storage containers.

Funding was secured and repairs were made to failing asphalt around the Fairbanks hangar and the aging heating oil furnaces were replaced with natural gas appliances.



Photo, Trent Adams works on fence in Beaver, Alaska (2022), by Dorothea Adams, CATG.

### Land Acquisition and Conveyances

The Bureau of Land Management conveyed several selected parcels within the Refuge exterior boundary to Alaska Native village corporations this year. An Alaska Native allotment owner requested USFWS acquire her parcel, which is near Birch Creek village corporation lands. USFWS is in consultation with the tribe on the idea of USFWS acquiring the parcel and adding the lands to the Refuge.



# Old BIA School Contaminant Remediation Project

As we reported last year, the USFWS owns a lot in Beaver, Alaska, which contains the current school and old Bureau of Indian Affairs school and associated structures. The grounds and the old school are contaminated with an assortment of chemicals. In 2023, a site report and scope of remediation was completed. BIA has partially funded the project and that work should begin in 2025. The Service will continue to seek funds to remediate the site. Once remediated, a land exchange with Beaver Kwitch'in Corporation could be done so the corporation would own this valuable site within the community.



Photo, oxbow lakes form when rivers change course creating pockets of habitat for waterbirds and fish, by U.S. Fish and wildlife Service.

#### **Moose Hunter Outreach Project**

In partnership with a social scientist and CATG, Refuge staff completed a project to improve administration of the federal moose hunt for GMU 25D West and help tribal administrators and hunters in Beaver, Birch Creek and Stevens Village be familiar with federal and state moose hunting requirements. One highlight was development and distribution of a hunter's handbook to each permit holder that explains the importance of reporting hunter effort and provides responses to frequently asked questions.



#### CATG Culture and Science Camp

As we did last year, the USFWS supported CATG's culture and science camp for youth. This year youth learned about how the Yukon Flats environment is changing and is anticipated to change this century due to rising greenhouse gas emissions. They also participated in a pollinator survey effort described in this report.

#### Contact Yukon Flats National Wildlife Refuge

Visit our website: https://www.fws.gov/refuge/yukonflats.

Engage with us on Facebook: <u>https://www.facebook.com/</u> <u>YukonFlatsNationalWildlifeRefuge</u>.

Contact the Refuge Office in Fairbanks, Alaska: Call 1-907-456-0440 or email the refuge at <u>yukonflats@fws.gov</u>.



Photo, a youth checking a pollinator trap during culture and science camp, by Jimmy Fox/U.S. Fish and Wildlife Service.

#### Outreach

We work hard all year long to connect with the public and share relevant and timely information. One of our best kept secrets is our Facebook page, where we reach thousands of people through weekly posts. Over the past year we gained followers and watched our median Facebook post engagement grow 366.7%.

Thank you to our audience for continued engagement, and a special thank you to audience members who live closest to or within the Refuge and share local knowledge in comments for the benefit of all. Ana basee. Mah'sii choo.

We also engage with the public and partners through in-person events like regular public meetings, the annual migratory bird event at Creamer's Field in Fairbanks and events in your local communities.

