



YUKON FLATS NATIONAL WILDLIFE REFUGE

Summary of Activities - Fall 2015 (revised Jan 2016)



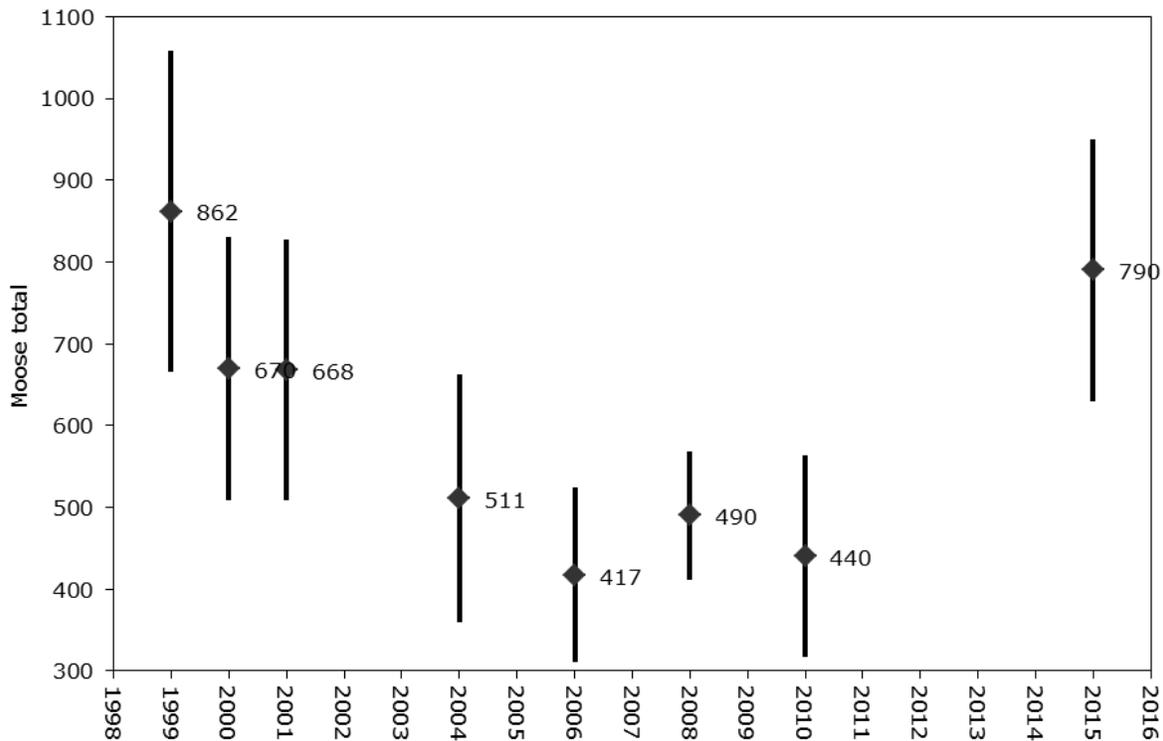
The Yukon Flats Basin is world renowned as one of the most important breeding grounds for waterfowl in North America. It also provides critical resources to over 1,200 residents that live in the Yukon Flats. Thus, the Yukon Flats Refuge focuses on monitoring the population status of animal's and their habitats important from both a local and national perspective. Special emphasis is also placed on species that may have declining populations. Following is a summary of completed and ongoing refuge projects for 2015.

Moose Survey - November 2015



A moose population survey was conducted on the Yukon Flats in November 2015. This was the first fall survey since 2010 due to a lack of snow in early winter that caused surveys in 2012-2014 to be cancelled. The estimate for the 2,269 mi² survey area in the western Yukon Flats (Alaska Game Management Unit [GMU]

25D) was 790 total observable moose (95% CI; 600-980). Density of moose was 0.35/mi² or 0.13/km². The population was comprised of an estimated 609 adults (95% CI; 460-759) and 191 calves (126-256). The estimate of total observable moose increased from 2010 to 2015. Improved calf survival may have contributed to the population increase in some recent years. It was unlikely that public harvest of wolves and bears contributed, as harvest intensity was light. Thus, moose density increased in the presence of lightly harvested wolf and bear populations, suggesting that the dynamics of this low density population may sometimes be more complex than previously thought.



Estimated observable fall moose total (with 90% confidence interval) for the western Yukon Flats. Note: confidence intervals for 2010 and 2015 totals do not overlap.

Aerial scoter and scaup surveys – 2014 and 2015



The 14th annual aerial survey to monitor scoter and scaup populations on the Yukon Flats was conducted 5-12 June, 2015. These data are currently being analyzed; below we present the data from

the 2014 survey which was conducted 5-8 June, 2014. White-winged scoters accounted for 99%, and surf scoters accounted for the other scoter species observed in 2014. The number of white-winged scoters estimated in the study area (10,559) during the breeding season was lower than the previous twelve-year mean (2001-2005 and 2007-2012) of 16,188. No black scoters were observed in 2014. The scaup monitoring index for 2014 was 23,017, which was 22% lower than the average index value for 2002 – 2013 (28,105). Pacific loons and trumpeter swans were counted opportunistically. In 2014, a monitoring index for Pacific loons was estimated at 2,125, which was not significantly different than the 7 year average from 2007 – 2013 (1,677). The trumpeter swan population index was 652 birds in 2014, which was similar to the previous 6 year average from 2007-2012 (782).



Aerial loon surveys – 2015

Aerial surveys have indicated the Yukon Flats is an important breeding area for Pacific loons (*Gavia pacifica*) and common loons (*G. immer*). Loons have been surveyed during waterfowl breeding pair surveys conducted by the Division of Migratory Birds since 1953, and more intensive loon surveys have been conducted by the Yukon Flats Refuge since 1984 (1988, 1999 – 2003, 2006). The 9th annual aerial survey to monitor loon populations on the Yukon Flats was conducted in 2015. These data are currently being analyzed.



Eagle surveys on the Black River and Birch and Beaver creeks

Bald eagles steeply declined by the mid-20th century due to egg shell thinning from DDT, widespread habitat loss, and harvest (legal and illegal). Bald and golden eagles are both birds of management concern by the U.S. Fish and Wildlife Service.

The refuge initiated a bald eagle “sticknest” survey in 2014 on the Chandalar, Porcupine and Black rivers to begin collecting locations of raptor nests (eagles and hawks) and measuring production of young along major river corridors in the Yukon Flats.

In 2015 surveys were initiated on Birch and Beaver creeks and repeated on the Black River. Data analysis is pending. Inventorying and monitoring bald eagle nests and foraging sites will not only provide information on their local densities, trends, and habitat use, but will also provide a database needed for responsible management.

Coarse woody debris work on Chandalar and Black Rivers



Have you ever considered the fate of all the wood that is grown on the Yukon Flats? Wood is harvested, burned, swept away in floods, buried in silt, consumed by insects and animals, the list goes on. Another important function of wood is its ability to be stored as carbon beneath the soil surface. The refuge initiated a project in 2014 with Colorado State University to inventory the amounts of woody debris found in our Yukon Flats stream systems. Goals of the project are to record wood blockages in our stream systems, better understand how wood obstructions influence river

channel connectivity and flooding and learn how wood is stored as carbon in stream systems. The Dall River and Preacher Creek were inventoried in 2014 and the Black and Chandalar rivers were surveyed this past summer. Additionally the Yukon River was sampled between Circle and the Dalton Highway Bridge. In total, the project sampled up to 700 river miles in the Yukon Flats.

Scaup brood production survey



A lesser scaup brood production survey was conducted for the second consecutive year at Canvasback Lake, Plot F (25 miles northeast of Beaver), and Track Lake (23 miles north of Fort Yukon) during 21 July to 31 July. The wetlands in these lake complexes each contain at least one lake large enough to safely operate a float plane on. Broods of Scaup and other waterbirds were counted by 3 teams of 2 observers. Counts used a double observer approach and the method differed based on wetland size. 2015 data is being analyzed and we anticipate a progress report completed by late winter 2015.

Moose - Mapping potential foraging habitat



The Yukon Flats Refuge and Koyukuk/Nowitna/Innoko Refuge have partnered with the U.S. Geological Survey to develop a willow map that when complete will show where willow habitats (and thus potential moose foraging areas) occur on and off the river and in some upland areas. Over the last two summers staff have mapped willow and non-willow stands (like birch and cottonwood) from the air (fixed-wing and helicopter) and collected vegetation data on the ground to help improve the map as well as get a relative

idea of browse availability among stands. With this information we are especially interested in how Yukon Flats willow stand species composition, structure and relative abundance, and

relative forage abundance, compare to those stands at the Koyukuk/Nowitna/Innoko Refuge were moose numbers are higher overall. A final map will be released later this winter.

Moose monitoring



A long term moose monitoring effort was initiated in 2013 by the U.S. Fish and Wildlife Service and Alaska Department of Fish and Game in Game Management Unit 25D West, Yukon Flats National Wildlife Refuge. The purpose of this effort is to measure health indices such as calf production and recruitment, partition and twinning rates, age at first reproduction, short yearling (10-month-old) weights, and survival of females and their offspring, indicators of the nutritional health of this low density moose population. From November 4-12,

2013, 38 female moose were captured and radio collared along the Yukon River near Beaver, Alaska and southward to the White Mountains. Radio tracking flights were conducted monthly and weekly during calving. Calf production and fall recruitment during 2014 was 78.4 and 50.0 per 100 females, respectively. Twinning rate was 19.9%. None of the 3 2-year old females were observed with calves. Over-winter survival for calves was 66.7%. During 2015, calf production was much higher with 128.1 calves per hundred cows and a twinning rate of 53.8. A total of 6 radio collared females have died since capture, November 2013, with 32 remaining on the air as of June 5, 2015. Cause of mortality include: 1 capture mortality, 3 wolf predation and 2 unknown. Adult survival for the 1st year was 97.3%, and 86.5% for the 2nd year. Annual home range estimate using MCP averaged 369 km², which exceeded other moose populations throughout their range. Of 502 locations, 45.6% were in the Yukon River floodplain, 31.7% river terrace, 13.3 % uplands and 9.4% mountains. Of all the locations, 29.5% were located within burns. Radio collared females appeared to be mostly non-migratory. However, more relocations over multiple years are necessary to make inferences related to home range and distribution.

Sheep survey



Dall's sheep occur on the southern Refuge boundary near Mount Schwatka. In mid to late July the Refuge collaborated with BLM and ADFG to estimate the presence of Dall's sheep in the White Mountains. A total of 357 sheep were observed in the Schwatka, Victoria, Fossil Ridge, Lime Peak, and Cache mountain regions. The ratio of lambs to ewes was 31:100, the same as reported for 2014.

2015 fire season



2015 was a very active fire season across Alaska with over 5 million total acres burning across the state. Below average precipitation and above average temperatures in May and June set the stage and when a period of unusually high lightning activity occurred between June 19 and June 22, the second busiest Alaska fire season ever recorded was off and running.

The Yukon Flats NWR saw 11 fires start within the refuge border this season, burning a total of 190,125 acres, of which 140,076 acres were FWS owned land. Of these 11 fires, 9 were located within the Limited fire management option and were monitored throughout the summer. 2 fires fell within Modified fire management option, with the Chahalie Lake the only fire to receive any suppression actions. As of 9/16, there were no human caused fires this year on the Yukon Flats NWR.

Invasive plant control work



The Yukon River is a major conduit for the spread of invasive species such as white sweet clover that may negatively impact moose and salmon habitats. The refuge partnered with the Fairbanks Soil and Water Conservation District and Fort Yukon, Beaver, Birch Creek, and Stevens Village to survey, map and control white-sweet clover during July-August 2015.

Elodea, a highly invasive aquatic plant, has not been found on the Yukon Flats Refuge but it is present in Chena Slough in Fairbanks and was recently discovered in Tolchaket Slough near Nenana on the Tanana River. The refuge is assisting the Fairbanks Fish and Wildlife Field Office, National Park Service, U.S. Forest Service and the Fairbanks Soil and Water Conservation District with a September 2015 inventory of the Tanana River in the Fairbanks/Nenana vicinity for presence of Elodea. The U.S. Fish and Wildlife Service and partners are making preparation for Elodea treatment in summer 2016 in affected areas.

Salmon spawning assessment



The salmon stocks in the Chandalar River support vital subsistence and commercial fisheries, and provide the largest stock of fall chum salmon in the Yukon River drainage. This valuable stock is monitored annually using sonar by the Fairbanks Fish and Wildlife Field Office (FFWFO). Fish passage past the sonar site in 2013 was approximately 198,000

chum salmon which is just above the long term average. 2014 data have not yet been analyzed.

Refuge staff and FFWFO have been collaborating with the Village of Venetie and University of Alaska Fairbanks to assess chum salmon habitats on the Chandalar River since 2013. The purposes of the project are to determine if groundwater discharge zones are associated with spawning presence and to develop a long term monitoring program of spawning habitats in the Chandalar River. In 2015 graduate student Chelsea Clawson came on board to manage the project. Plans are underway to collect a second round of aerial photography of spawning areas in September 2015. A special thanks to Lance Whitwell, Native Village of Venetie Tribal Government, for offering support to this project.

Trail camera monitoring

Staff at Yukon Flats NWR recently discovered a compelling picture of a red fox carrying a prey



item in its mouth while examining results from an experimental trail camera study. While not sure what the fox was eating, what was clear was that experimental trail cameras functioned well throughout winter 2014-2015. In September 2014, Refuge staff placed 4 trail cameras on the Refuge and left them until April 2015. The idea was to test whether the cameras could function down to the low temperatures in the area and whether the batteries could last the winter. If so, staff could proceed with the purchase of additional cameras to develop a network that could be used to monitor furbearers.

Cameras captured numerous pictures of foxes, lynx, wolverine, marten, snowshoe hare, and moose, both during the day and at night. And the temperature stamp on the pictures verified they functioned even during extreme cold, with photos taken down to -43 degree Celsius (-45 degrees Fahrenheit). In addition, cameras were timed to record two photos per day that documented temperature, onset of snow, snow depth (with the aid of a snow stake), large wind events that drifted snow, and in the future will be used to document snow melt in an effort to monitor phenology of winter break-up.

Trail camera technology has increased to where these cameras can be deployed all winter and very likely year-round. The cameras work day and night and can allow biologists to learn about previously unseen aspects of life on the Refuge. Refuge staff also expects presentation of trail camera pictures will be a hot topic at public meetings.

Black bear survey



Black bears are generally difficult to observe from an aircraft due to the thick forest cover. However, in the spring, prior to leaf out, bears are commonly observed on open wetlands feeding on aquatic vegetation. Perhaps they are purging out their digestive tract after coming out of the

den. Staff flew over a large group of wetlands between Beaver and Birch Creek on May 11, 18, and 22 and observed 4, 14, and 4 bears, respectively. Many bears that were observed were standing in open water as they feed on aquatic plants and were highly visible. We plan to repeat this effort in 2016 to identify the dates that bears are in highest concentrations on wetlands. The objective of the project is to develop a long term monitoring survey to detect the trend in black bear observations.

Hyperspectral Imaging



The Refuge is collaborating with the University of Alaska Fairbanks (UAF) in testing out the use of a new tool to collect high resolution aerial photography. The instrument is called HySpex, and when mounted in the port hole of an aircraft, is capable of collecting high resolution spectral images. Most cameras can detect the primary colors, red, green and blue but this instrument can differentiate over 150 different spectral bands. In early September

photography was collected over Yukon Flats wetlands between Beaver and Birch Creek in an effort to better describe lakes and plant communities. UAF will analyze the data over the winter and, working with Refuge staff, we will determine means for this new technology to support land management.

Moose management meeting



The refuge participated in a moose management meeting in Fort Yukon on April 7 and 8. The Council of Athabascan Tribal Governments (CATG) organized the meeting which was funded through the Annual Funding Agreement between USFWS and CATG. The meeting was well attended by representatives from all the Yukon Flats Villages, the Refuge and Alaska Department of Fish and Game. One objective of the meeting was to discuss strategies to achieve goals and objectives of the 2002 Yukon Flats Cooperative Moose Management Plan. CATG is currently summarizing the meeting notes.

Hospital Lake monitoring



Ten students from the village of Fort Yukon worked with the Yukon Flats Refuge staff this summer to participate in a science camp at Hospital Lake in Fort Yukon. Student participants included Lydia Acker, Kaila Druck, James Fields, Trevor Hardy, Caleb Knudson, Marissa Peter, Troy Solomon, Catherine Solomon, Theodore Solomon, and Lisa Strom. Hospital Lake, adjacent to the Fort Yukon airport landing strip, offers the Refuge an opportunity to collect waterfowl information and provide a learning opportunity for local youth while strengthening the relationship between the Refuge and Fort Yukon residents. Students inventoried ducks, collected invertebrates, captured small mammals, deployed fish traps, collected dragonflies and other insects, and learned to use Global Positioning Systems (GPS).



Refuge Law Enforcement Officer Clay Hamilton (left) having a chat with Fort Yukon Youth attending the refuge sponsored Science Camp at Hospital Lake.

Circle Open House



Refuge staff in collaboration with the Fairbanks Fish and Wildlife Field Office and the Circle Tribal Council, sponsored a “Science Partners Open House” on July 1 in Circle. The gathering included a BBQ, the opportunity to ask scientists and managers about ongoing projects in the Yukon Flats, and activities for the youth. The gathering was well received by Circle residents.

Youth Camp at Julie Mahler's



Julie Mahler, Yukon Flats Refuge Information Technician (RIT), hosted a 3-week cultural camp this summer at her cabin on the Porcupine River. Youth from Beaver, Fort Yukon, Venetie and Arctic Village attended this event, which was designed in partnership between CATG and Yukon Flats Refuge. Youth learned outdoor survival skills, built survival shelters, made boat paddles, and had daily Gwich'in story/language hour with a local Native elder. Refuge staff provided an archery class, career opportunities, and team building games. Thanks for all your hard work, Julie!

Wilburforce Foundation & National Wildlife Refuge Association Visit



The Refuge was visited by representatives of the Wilburforce Foundation and the president of the National Wildlife Refuge Association. They experienced RIT Julie Mahler's subsistence camp at 8-mile Porcupine River. Julie provided a home cooked meal including fresh vegetables from her garden and local wild resources. Refuge Law Enforcement Officer Mimi Thomas provided boat transportation for the visit and Vince Mathews Refuge Subsistence Coordinator gave a refuge overview and a tour of Fort Yukon. The high point for the visitors was the warm welcome by Flats youth at 8-mile camp.

Arctic Village Science Camp



RIT Julie Mahler shared with the Arctic Village students her traditional knowledge on how to build a caribou skin boat, preparing harvested wild resources, and her artistic talents. Vince Mathews helped the students how to navigate with a compass and assisted with the arts & craft sessions drawing wildfowl pictures, weaving baskets from willows, and bead work. Julie was a big help with preparing the daily meals and mentoring the students. Vince kept things lively with the kitchen staff and the students. All learned from each other. Retired Refuge Interpreter Paul Williams, Sr. shared his traditional wisdom through stories and life experiences.

To access up to date Yukon Flats Refuge events please join us on Facebook at:

<https://www.facebook.com/YukonFlatsNationalWildlifeRefuge>