



United States Department of the Interior

FISH AND WILDLIFE SERVICE
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INFORMATION BULLETIN - December 2021

Cooperative Salmon Escapement Monitoring Projects. Contact: Pat Walsh

The Alaska Department of Fish and Game (ADF&G) has monitored Chinook, chum and sockeye salmon escapement on the Middle Fork Goodnews River since 1980. Togiak National Wildlife Refuge (Togiak Refuge) has worked with ADF&G since 1992 to assist in staffing the weir until 2017, after which reduced funding prevented providing staff assistance.

On the Kanektok River, ADF&G, Native Village of Kwinhagak, Coastal Villages and Togiak Refuge have worked cooperatively to monitor salmon and Dolly Varden runs since 2001. However, this project has been cancelled since 2016 due to lack of funding.

The Togiak Refuge fisheries biologist retired in 2017 and the position has not been refilled. However, the current Togiak Refuge manager has identified re-filling this position as a high priority, as well as re-engaging in cooperative salmon monitoring projects.

Mulchatna Caribou Contact: Andy Aderman

Togiak Refuge assisted ADF&G with telemetry and law enforcement flights, satellite data acquisition, data entry and database management. A July 2021 post-calving survey estimated the Mulchatna herd at 12,850 caribou, slightly down from 13,500 estimated in 2019 and 2020, and well below the population objective of 30,000-80,000 caribou.

Togiak Refuge Manager Moos, under authority delegated by the Federal Subsistence Board, closed caribou hunting and closed Federal public lands in the RC503 hunt area for caribou hunting.

Togiak Refuge and ADF&G staff plan to radiocollar caribou in March/April 2022 in the area from Cape Newenham north to the Arolik River. We suspect caribou inhabit this area year-round and are not migratory.

Nushagak Peninsula Caribou Contact: Andy Aderman

A photocensus of the Nushagak Peninsula Herd on July 7, 2021 found a minimum of 258 caribou in 3 groups which resulted in a total population estimate of 287 +/- 47 (258-334) caribou at the 95% confidence interval. A similar effort in 2020 found a minimum of 209 caribou in 2 groups resulting in an estimate of 226 +/- 47 (209-273) caribou.

The Nushagak Peninsula Caribou Planning Committee met via teleconference July 28, 2021 and reviewed results of previous hunts, population and lichen monitoring and the harvest strategy. Agency biologists agreed a limited harvest of caribou would not impact the growth of the herd. A majority of the Committee

avored having a hunt with a total of 8 permits, with 4 permits going to Manokotak and 2 permits going to each Aleknagik and Dillingham. Refuge Manager Moos' decision was to open the Federal caribou hunt on the Nushagak Peninsula from August 1-March 15 with a harvest objective of 8 caribou. No caribou have been reported harvested in the 2021-2022 Federal permit hunt as of December 10, 2021. A composition survey conducted in October 2021 classified a total of 153 caribou (82 cows, 39 calves, and 32 bulls) which is nearly 60% of the minimum population observed in July 2021. Ratios of calves and bulls per 100 cows were 47.6 and 39.0, respectively. Compared to 2020, the ratio of calves to cows were similar, while the ratio of bulls to cows increased 6 points.

Moose Contact: Andy Aderman

Ten female moose (9 calves and 1 young adult) were captured and collared in mid-April in the Kanektok and Goodnews River drainages.

In 2021, 20 of 23 collared cows produced a minimum of 35 calves (6 singles, 13 sets of twins, and 1 set of triplets) suggesting a production rate of 152.2 calves per 100 cows. Twinning rate was 70.0%.

In November 2021, only 3 single calves were observed with 20 collared cows suggesting a fall recruitment rate of 15 calves per 100 cows. This was the lowest fall calf recruitment rate since monitoring began in 1998.

During the 2021-2022 moose hunts in Unit 17A (RM 571, RM 573, and DM 570), hunters reported harvesting 41 moose (39 bulls, 2 cows) which was down from the 60 moose (55 bulls, 5 cows) taken the previous year. In southern Unit 18, hunters reported harvesting 7 bulls in the RM 617 hunt and 12 bulls in the RM 620 hunt. Harvest was down 5 moose for the RM 617 hunt and no change for the RM 620 hunt.

The relationships of wolf and brown bear predation with moose population density and growth at Togiak National Wildlife Refuge and BLM Goodnews Block, Alaska Contact: Pat Walsh

In summer 2014, Togiak Refuge, the USFWS Genetics Lab, ADF&G, and BLM initiated a study to understand the effects of wolf and brown bear predation in regulating the populations of moose. The study relies on radio telemetry and stable isotope analysis. Our approach is to relate the predation impact by wolves and bears on moose at varying levels of moose population density. This requires having population estimates of both bears and wolves. We estimate the brown bear population totals approximately 855 bears (95% confidence limits: 664 – 1,154). Using radio telemetry, we estimate the wolf population varies widely but averages 90-100 wolves consisting of approximately 12 packs averaging 7 wolves plus approximately 10% of wolves unaffiliated with packs. Using these demographic data, we will model wolf and bear predation on moose based on the diet composition of both species determined through analysis of carbon and nitrogen isotopes occurring in wolf and bear tissues. Lab analyses are complete and modelling is currently underway.

Walrus Contact: Doug Holt

The Togiak Refuge has annually monitored the number and timing of Pacific walrus at haul-outs since 1985, using ground counts (1985-2008), aerial surveys (2003-2011) and time lapse photography (2010-2019). Overall, walrus numbers observed at haul-outs on Togiak Refuge have declined, with the greatest declines at Cape Peirce and Cape Newenham. Peak counts in the most current year when every day was counted (2016) were 401 at Cape Peirce, 897 on Hagemeister Island, and 454 at Cape Newenham. Walrus using haul-outs in Bristol Bay are typically recorded from late spring to late fall but were observed at Cape Newenham every month since cameras were deployed in fall of 2014 until February 2017. Data were recovered at all sites during summer 2019 and are currently being examined. In an effort to reduce potential

spread of COVID-19 in the community travel to field sites was strictly limited and sites were not visited during 2020. The most recent report was completed in August 2019 and is available to the public at <https://ecos.fws.gov/ServCat/DownloadFile/168185>. Monitoring stations on Cape Peirce were visited in July 2021. Refuge staff plans to visit all remaining sites in August 2021.

Seabirds Contact: Jannelle Trowbridge

The abundance of black-legged kittiwakes, common murre, and pelagic cormorants has been monitored at Cape Peirce since 1990. Monitoring was postponed in 2020 due to Covid and continued in 2021. This year's average number of birds counted on study plots was 400 kittiwakes, 113 murre, and 14 cormorants. Over the past 30 years, the average number of birds counted on study plots was 1,052 kittiwakes (range = 238-1,906), 2,506 murre (range = 53-4,563), and 86 cormorants (range = 14-123). Abundance has been below average for all three species since 2016.

Invasive Aquatic Plant Surveys Contact: Kara Hilwig

Elodea spp. is a highly invasive and difficult to control aquatic plant implicated in the degradation and loss of fish habitat across the world. It was confirmed present in Alaska in 2009 and is now found in several waterbodies across the State. Refuge and Park staff are cooperating to complete the fourth *Elodea* survey within the Togiak Refuge, Wood-Tikchik State Park and the surrounding area. Twenty-five annual monitoring sites have been established in high use areas such as lodge docks, boat ramps, and popular float plane destinations. In 2021, crews sampled 9 locations in the Park, 28 in the Refuge, and 13 in the outlying area from August 4 to September 27. Sampling effort included overflights of 20 lakes and 29 fragment searches, and 643 rake samples. No *Elodea* or other invasive aquatic plants were detected. Funding proposals are currently being submitted to continue this work in 2022.

Water Temperature Monitoring Contact: Doug Holt

Stream temperature monitoring has been conducted at 21 locations on 14 rivers in Togiak Refuge since August 2001. Continuous hourly water temperatures were recorded at each site. Over 2.4 million temperature records were collected, quality-graded, and digitally stored in a relational database through October 2019. The warmest month each year was July. The maximum recorded mean daily summer temperatures varied by location, with median values of 9.8–22.9°C across sites. The warmest temperatures were observed in the Kukaktlim Lake outlet and the coolest temperatures were observed in the Weary River. The most recent stream temperature monitoring report was completed in September 2018 and is available to the public at <https://ecos.fws.gov/ServCat/DownloadFiles/169087>. A report detailing measurements recorded through summer 2019 is currently under review and a link to that report will be provided when the report is finalized and posted. Refuge staff plans to visit every stream temperature site in August 2021.

We used moored all-season temperature arrays to record hourly temperatures throughout the water column in 2 lakes on or near the Togiak Refuge 2011-2020. The lakes differed significantly in surface area, water volume, and elevation with Ongivinuk Lake being smaller and at higher elevation than Snake Lake. We observed variation in lake ice phenology and fewer days of ice cover on Snake Lake than on Ongivinuk Lake each winter when data were available for both lakes. We observed that both lakes were dimictic, exhibiting turnover events in spring and fall. We observed water temperatures in excess of standards for fish rearing and migration habitats during summer down to 12.5 m in Snake Lake and down to 5 m in Ongivinuk Lake. The most recent lake water temperature monitoring report was completed in March 2019 and is available to the public at <https://ecos.fws.gov/ServCat/DownloadFile/169088>. In an effort to reduce spread of COVID-19 sites were not visited during 2020. The Snake Lake site was visited in July 2021 and instruments were found in working order. The measurements were downloaded but have not been added to the overall data set. A visit to Ongivinuk Lake by Refuge staff is planned for August 2021.

Quantifying River Discharge Contact: Pat Walsh

Togiak Refuge and the USFWS Water Resources Branch have worked cooperatively since 1999 to acquire baseline hydrologic data of the flow regime (magnitude, duration, timing, frequency, and rate of change) and water quality. A network of stream discharge gages collected stream flow data from 1999-2005 at 20 locations. A subset of five of these stations continued to collect data through fall 2009, after which three of the five stations were removed. We will monitor discharge in the Togiak and Kulukak Rivers indefinitely, although due to Covid-19 travel restrictions, work was minimized since 2020.

Recovery of overgrazed lichen on Hagemeister Island Contact: Pat Walsh

Reindeer were removed from Hagemeister Island in 1993 following overgrazing that resulted in starvation in about 1/3 of the herd and damage to reindeer habitat. Since then, Togiak Refuge biologists have monitored the recovery of lichen communities and have found that average lichen biomass increased from 450 lb/acre in 2003 to 709 lb/acre in 2015. We calculated time to recovery with three competing growth curves which estimate grazeable biomass may be reached in 34-41 years and full recovery in 71 – approximately 400 years. Lichen communities were composed of various mixtures of at least 78 lichen species, but were dominated by important reindeer forage species. While reindeer overgrazing diminished forage quantity, it did not eradicate preferred forage. Results from this study were published in 2021 in the journal *Rangifer*.

Education and Outreach Contact: Terry Fuller

Togiak Refuge has an active education and outreach program, conducting an average of 60+ classroom visits throughout 12 Bristol Bay villages annually, during a normal school year. That total was cut short for the end of the 2019-2020 calendar year due to covid-19. Classroom visits include lessons about the Migratory Bird Calendar, National Wildlife Refuge Week, careers in natural resource conservation, and numerous teacher requested classroom presentations. The Refuge works with several school districts and private schools including the Southwest Region, Lower Kuskokwim, Dillingham City school districts and the Dillingham 7th Day Adventist School. Some topics often include bird walks, wilderness survival skills, archery, salmon life cycles, aquatic resources, and bear safety. At this time, outreach is still being impacted by covid-19; we are hopeful for a return to full outreach efforts in the near future. The refuge website is also an education tool and is available at <http://togiak.fws.gov>.

Togiak Refuge, in partnership with ADF&G and the Southwest Region School District, also conducts hunter safety courses throughout western Bristol Bay Villages. Classes have impacted more than 100 students in Manokotak, Dillingham, Twin Hills, Togiak, Aleknagik and Quinhagak. The refuge plans to continue these courses, as requested, in 2021 and is in the planning stages to add a National Archery in School Program to its offerings in the future, pending a return to normal outreach efforts.

The Refuge education program also produces Bristol Bay Field Notes, an award-winning weekly radio program on KDLG 670 AM that covers an array of outdoor-related topics (past episodes can be found on KDLG's website). Togiak Refuge has an active and heavily followed Facebook page which disseminates information on a daily basis to a rapidly growing global audience. These outreach efforts have not been affected by covid-19 and are available for public consumption at their regular rate of production.

The Refuge normally hosts an Open House event, in celebration of National Public Lands Day and National Hunting and Fishing Day. It was not held in 2020. This event is usually attended by 100-200 people and includes a wide range of displays, hands on activities, food and beverages.

Togiak Refuge staff continues to work with the Alaska Migratory Bird Co-Management Council and the

ADF&G to conduct household subsistence waterfowl surveys. Refuge staff and volunteers conducted surveys in a number of southwest Alaska communities, Aleknagik, Dillingham, Togiak, Clark's Point, Newhalen, Nondalton, Chignik Lake and Chignik Lagoon. Surveys were put on hold for this year, due to covid-19.

Also, the Refuge partners with others to conduct three environmental education camps. As with other Service sponsored education camps, those camps were cancelled for 2020 and have not happened yet in 2021, due to covid-19 related concerns. The descriptions that follow are from the 2019 camps.

Cape Peirce Marine Science and Yup'ik Culture Camp Contact: Terry Fuller

In July 2019 an enthusiastic group of seven area junior high students representing three villages (Dillingham, Togiak and Platinum) traveled to Cape Peirce for this camp. Students were able to observe seabirds, marine mammals, and learn how field work is conducted, as well as learning about the food webs and ecological relationships found at the Cape Peirce area. Students also learned about traditional Yup'ik uses of animals and plants and about Native survival skills. This camp is designed to help students gain a better understanding of the biological diversity of a marine ecosystem. It also strengthens their sense of stewardship for local natural resources. Other topics at this camp included tide pools, wilderness survival skills, archery, bear safety, Leave No Trace camping practices and careers with USFWS. Refuge Interpreter Jon Dyasuk spoke with students about traditional resource uses. A special offering for this year's camp was the chance for the students to try their hand drawing with Colorado pastel artist Penny Creasy. Traditional councils and school districts from throughout western Bristol Bay are cooperators with this camp.

Southwest Alaska Science Academy (Salmon Camp) Contact: Terry Fuller

In July 2019, Togiak Refuge helped with the 19th year of a summer camp aimed at teaching middle and high school students about fisheries science and the importance of salmon to our ecosystem. Students were selected from the Bristol Bay region. During the camp students worked in the field alongside fisheries professionals. Cooperators with the Refuge on this project included the Bristol Bay Economic Development Corporation, Bristol Bay Science and Research Institute, University of Alaska, University of Washington School of Fisheries, the Dillingham City and Southwest Region school districts, and ADF&G.

Summer Outdoor Skills and River Ecology Float Camp Contact: Terry Fuller

The 2019 Float Camp took place on the Togiak River early August. At this camp, four high school students learned about river ecosystems and how to enjoy them safely and responsibly while taking part in a float trip conducted on a refuge river. Students observed and learned about the many fish, wildlife and plant species found on the Togiak and its tributaries. Rafting skills, water safety, different angling practices (Catch and Release), Leave No Trace camping practices and bear safety were topics during the trip. Students also participated in other outdoor activities such as wilderness survival skills. This camp helps students grasp the biological diversity of riparian ecosystems and the importance of salmon as a nutrient source, while developing a deeper sense of stewardship for local natural resources. Montana Artist Mara Menahan was along as an "Artist-in-Residence" and all of the students had an opportunity to work with Mara on natural history illustration while in the field. Traditional councils and school districts in western Bristol Bay are cooperators with this camp.

Division of Refuge Law Enforcement Contact: Derek Thompson

Federal Wildlife Officers work to protect wildlife and habitat and make refuges safe places for visitors and staff. Regional Law Enforcement Specialists (LES) Derek Thompson is stationed in Dillingham, AK. He is the Officer responsible for patrolling Togiak NWR and providing Regional assistance and guidance for the AK Division of Refuge Law Enforcement (AK DRLE) program.

Subsistence use generally stayed the same or increased during 2020, however commercial and sport use of the Refuge dropped off dramatically. However, 2021 has been a busy year with visitation rates normalizing. Mulchatna and Nushagak Peninsula caribou are a local and regional priority. LES Thompson is the Federal team lead for patrolling and monitoring the Eastern Mulchatna herd. This winter AK DRLE will again team up with up with ADF&G, AWT, BLM, and FWS OLE to enforce the Mulchatna caribou closed season.

SFWO Thompson encourages anyone with questions regarding USFWS law enforcement to contact him; and reminds all who enjoy and rely upon the resources in the Bristol Bay Region the USFWS Division of Refuge Law Enforcement is here to help protect those resources for future generations.

Staff Update

Wildlife Biologist Doug Holt accepted the Supervisory Wildlife Biologist position with Sheldon Hart Mountain National Wildlife Refuge in Oregon. Doug will leave us in mid-January 2022.

The Fisheries Biologist position will be advertised in December 2021.